



U.S. DEPARTMENT OF THE INTERIOR
**BUREAU OF LAND
MANAGEMENT**

Ambler Road

Draft Supplemental Environmental Impact Statement

Volume 2: Appendices G–K

An aerial photograph showing a wide, light-colored river meandering through a vast, flat landscape. The river is flanked by dense forests with yellow and green foliage. In the distance, a range of low mountains is visible under a blue sky with scattered clouds. The foreground shows a sandy or silty riverbank.

Mission

To sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.

Cover photograph: Middle Fork of the Koyukuk River in fall foliage.

Photograph courtesy of BLM staff

DOI-BLM-AK-F030-2016-0008-EIS

BLM/AK/PL-19/013+1610+F000

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Appendix G. Alternatives Development Memorandum

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Revisions History

October 2018: The Bureau of Land Management (BLM) completed this document in its original form to document the alternatives evaluation process undertaken in consultation with cooperating agencies and completed in 2018.

February 2019: The BLM included revisions related to refinement of Alternative C, as had been anticipated in the October 2018 publication. Blocks of text were marked as “February 2019 Update.”

June 2019: The BLM added a few technical corrections in response to comments made by cooperating agencies. The agency review came at the time this document was attached to the preliminary draft environmental impact statement as Appendix G and distributed to cooperating agencies as part of the PDEIS review package. The date was retained as “October 2018, Updated February 2019.”

May-September 2023: The BLM revised this document as part of the Supplemental Environmental Impact Statement (EIS) process. Revisions were made to reflect public scoping comments received on the Draft Supplemental EIS (Attachment A, Scoping Comments on Alternatives) as well as input received during the cooperating agencies’ alternatives development workshop held in May 2023.

Acronyms and Abbreviations

AIDEA	Alaska Industrial Development and Export Authority
ANILCA	Alaska National Interest Lands Conservation Act
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CWA	Clean Water Act
DMTS	Delong Mountain Transportation System
DOI	U.S. Department of the Interior
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	Environmental Impact Statement
GAAR	Gates of the Arctic National Park and Preserve
MP	Milepost
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
PA	Programmatic Agreement
ROW	Right-of-Way
SF 299	Standard Form 299
TCC	Tanana Chiefs Conference
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WAH	Western Arctic Caribou Herd

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1. Introduction*

This Alternatives Development Memorandum summarizes alternatives development work undertaken to date regarding Alaska Industrial Development and Export Authority's (AIDEA's) application for a right of way to construct a road across federal public lands to the Ambler Mining District in north-central Alaska. The federal public lands include areas managed by the Bureau of Land Management (BLM) and areas upon which various communities live. The BLM is charged by law under the National Environmental Policy Act (NEPA) with evaluating reasonable alternatives in an environmental impact statement (EIS) and comparing them with a no action alternative.

This appendix documents the alternatives BLM has considered and those the BLM is carrying forward for further evaluation. The document originally was completed in October 2018 and has been updated in 2019 and 2023 to reflect refinements or new information. The memorandum contains documentation regarding the project purpose and need (Chapter 3) and screening criteria (Chapter 4) that were necessary in preparation for addressing the range of alternatives. This memorandum documents the range of concepts and alternatives considered (Chapter 5) and how those alternatives were screened (Chapter 6). This range of concepts and alternatives includes those previously studied by the Alaska Department of Transportation and Public Facilities (DOT&PF) and AIDEA and those suggested during scoping. It finally, by way of conclusion and next steps (Chapter 7) discloses to the public those alternatives the BLM and the cooperating agencies have determined to move forward for additional analysis and those considered not reasonable. The memorandum ends with a bibliography (Chapter 8).

By way of background, AIDEA is a public corporation of the State of Alaska that has a purpose to promote, develop, and advance the general prosperity and economic welfare of the people of Alaska and to create additional employment. On November 24, 2015, AIDEA filed Standard Form 299 (SF 299), Application for Transportation and Utility Systems and Facilities on Federal Lands, pursuant to Title XI of the Alaska National Interest Lands Conservation Act of 1980 (ANILCA). AIDEA's SF 299 is a right-of-way (ROW) application for surface transportation access across federal public lands to mineral deposits in the Ambler Mining District on the southern flanks of the Brooks Range. SF 299 was filed with 5 federal agencies¹ for a proposed Ambler Mining District Industrial Access Road Project. The filing date of the ROW application was revised to June 20, 2016, when AIDEA submitted additional information to supplement the application. AIDEA subsequently submitted SF 299 amendments, clarifications, and additional information on April 29, 2019; October 29, 2019; and November 13, 2019. On February 5, 2020, AIDEA submitted a revised Application for Department of the Army to the Alaska District of the U.S. Army Corps of Engineers (USACE) pursuant to the Rivers and Harbors Act Section 10 and Clean Water Act (CWA) Section 404, among others, which included a revised permit application narrative.

AIDEA is requesting a ROW to construct and operate an all-season, industrial-access road that is approximately 211 miles long. The road would provide industrial access from the Dalton Highway across various federal lands for development of the Ambler Mining District.

The Proposed Ambler Mining District Industrial Access Road (the Amber Road) was originally analyzed in the March 2020 Final EIS and authorized in a joint Record of Decision (JROD) issued in July 2020 by the BLM and USACE. Litigation commenced with suits from multiple parties in August and October 2020. In February 2022, the U.S. Department of the Interior (DOI) requested the U.S. District Court for Alaska grant voluntary remand, stating that additional legal analysis had revealed deficiencies in the BLM's analysis of subsistence impacts under ANILCA Section 810 and consultation with tribes pursuant

¹ The Bureau of Land Management, National Park Service, U.S. Army Corps of Engineers, U.S. Coast Guard, and Federal Highway Administration.

to Section 106 of the National Historic Preservation Act (NHPA). In addition, DOI stated it intended to supplement the NEPA analysis on remand. The court granted that request in May 2022, returning the matter to the BLM to correct the identified deficiencies. This supplemental analysis will address deficiencies identified during the litigation process.

The BLM Fairbanks District Office (Fairbanks, Alaska) is developing this Supplemental EIS under NEPA and Title XI of ANILCA. The Supplemental EIS is required prior to any decision about federal authorizations and is in response to AIDEA's application. The BLM is the lead federal agency for preparing the EIS because the proposed route begins at the Dalton Highway and would need to first cross BLM land. Without the BLM's approval, the remainder of the route could not be accessed. The BLM has authority to grant a ROW across BLM-managed lands (approximately 23 miles of the proposed 211-mile-long corridor), subject to compliance with Section 810 of ANILCA and Section 106 of the NHPA, among other environmental laws and regulatory requirements.

2. Alternatives Development Process

An EIS, or Supplemental EIS, is required to present the purposes for which an action is proposed (purpose and need statement), evaluate all reasonable alternatives for satisfying the project purpose, and present the impacts of each alternative, including a no action alternative, for the consideration of decision makers before they make their decision. It is necessary to determine the range of potential alternatives and ultimately determine which are reasonable. According to the Council on Environmental Quality (CEQ),

The phrase 'range of alternatives' refers to the alternatives discussed in environmental documents. It includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminating them.

– Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations

CEQ also states:

When there are potentially a very large number of alternatives, only a reasonable number of examples, covering the full spectrum of alternatives, must be analyzed and compared in the EIS.

– Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations

The process of identifying the range of alternatives and determining the reasonable alternatives is preliminary to preparing a Draft EIS and may be continually refined as this Draft Supplemental EIS is developed. The steps the BLM has undertaken previously to identify the reasonable alternatives are illustrated in Figure 1. These are:

1. Develop and Refine Purpose and Need (Note: The revised statement of purpose and need is reflected in Section 3, Purpose and Need, of this alternatives memorandum.)
 - a. Develop initial statement of purpose and need.
 - b. Revise the statement based on scoping input (public and agencies) and cooperating agency input.

- c. Finalize statement during meeting held with applicant and cooperating agencies.
2. Identify Alternatives and Screening Criteria (Note: The screening criteria are presented in Section 4, Screening Criteria, of this alternatives memorandum.)
 - a. Develop initial criteria proposed for screening alternatives considering the purpose and need and scoping comments.
 - b. Revise criteria based on cooperating agency input.
 - c. Identify a range of potential alternatives (modes and routes) from the applicant and from scoping (public and agency input). Alternatives considered are presented in Section 5, Alternatives Considered, of this alternatives memorandum.
3. Apply Screening Criteria / Evaluate Alternatives (the subject of this document)
 - a. Apply screening criteria for an initial screening of alternatives.
 - b. Gather cooperating agency input regarding initial screening and potentially reasonable alternatives in this document.
 - c. Document BLM interim decisions about reasonable alternatives in this document.
 - d. Revise this document based on cooperating agency input and release it to the public to document BLM interim decisions regarding alternatives not carried forward for further analysis.

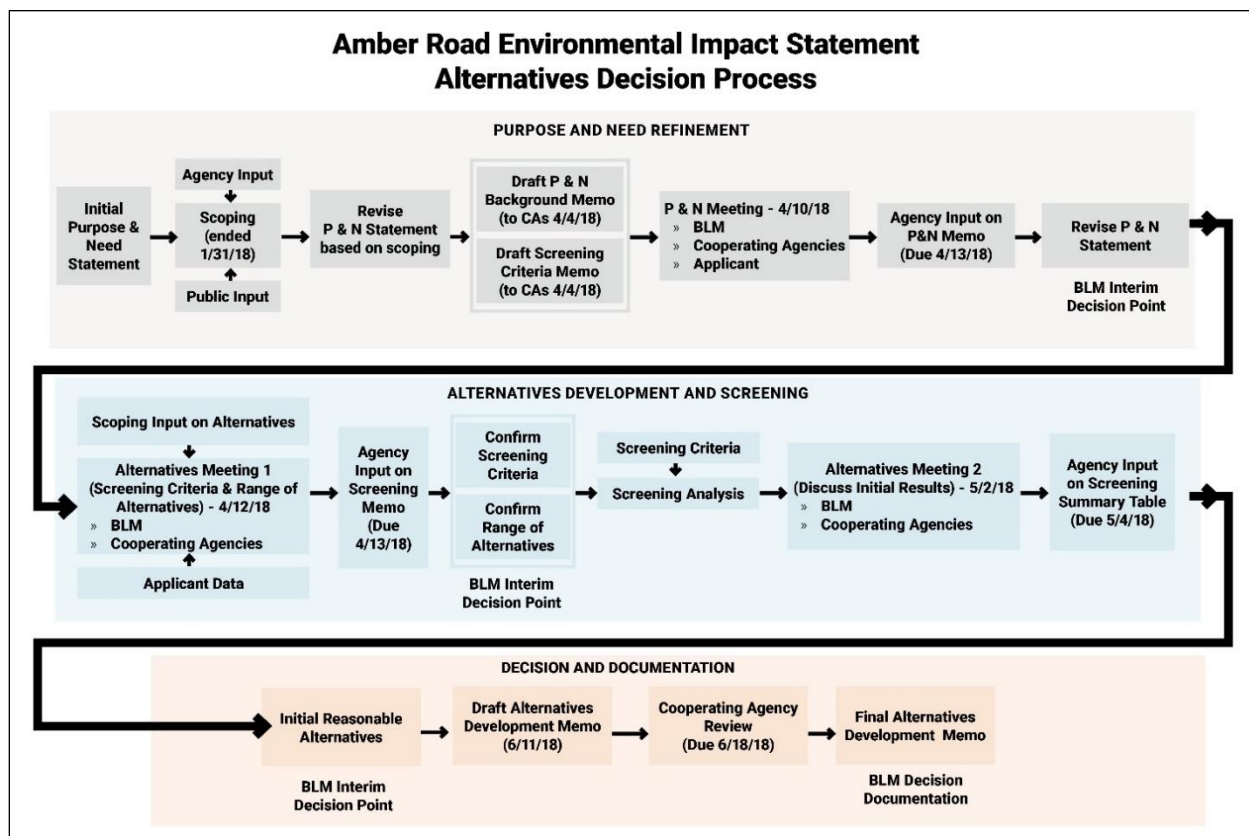


Figure 1. Alternatives development process

This figure depicts the alternatives development process BLM used to identify and evaluate alternatives. This process is described throughout the remainder of this document.

Source: Graphic developed by HDR

3. Purpose and Need

The statement of purpose and need helps identify alternatives carried forward into an EIS. An alternative is reasonable only if it satisfies the identified purpose and need for the project. Elements of the statement of purpose and need become criteria used to consider a wide range of alternatives and identify those that are reasonable.

BLM developed an initial statement of purpose and need in the original EIS process. As part of the original EIS process in 2018, the BLM revised the purpose and need statement based on public and agency scoping comments. Changes included the addition of a statement of need, addition of the term “year-round,” and a general rewording to make these changes read more clearly. BLM shared that purpose and need during the Supplemental EIS scoping process in 2022, which included the public and agencies, and invited comment on it. The BLM evaluated comments and made no changes. The BLM is responding to an application for a ROW under Title V of the Federal Land Policy and Management Act (FLPMA) for year-round industrial surface transportation access across BLM-managed lands to the Ambler Mining District.

4. Screening Criteria*

Screening criteria are metrics used to evaluate and, ultimately, “screen out” alternatives that are not reasonable (i.e., those that do not meet the criteria). As noted in the previous section, the statement of purpose and need is a key source for screening criteria. Other criteria were developed as part of the larger scoping and screening process based on input from the public, tribes, agencies, and internal deliberations within BLM.

BLM’s NEPA Handbook indicates that in determining the alternatives to be considered, the emphasis is on what is “reasonable” rather than on whether the proponent or applicant likes or is capable of implementing. It reiterates guidance from the CEQ, indicating that:

Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. (BLM NEPA Handbook, Section 6.6.1)

Furthermore, the BLM NEPA Handbook indicates that BLM “can only define whether an alternative is ‘reasonable’ in reference to the purpose and need for the action.” Finally, the handbook at Section 6.6.3 indicates that the BLM may eliminate an action alternative from detailed analysis if any of the following are true:

- It is ineffective (i.e., it would not respond to the purpose and need).
- It is technically or economically infeasible (i.e., whether implementation of the alternative is likely given past and current practice and technology; this does not require cost-benefit analysis or speculation about an applicant’s costs and profits).
- It is inconsistent with the basic policy objectives for the management of the area (e.g., not in conformance with the land use plan).
- Its implementation is remote or speculative.
- It is substantially similar in design to an alternative that is analyzed.
- It would have substantially similar effects to an alternative that is analyzed.

BLM used this guidance to develop criteria for this project and shared these criteria with cooperating agencies. The criteria were then refined based on the input received. The project screening criteria, used to identify alternatives warranting further analysis in the previous EIS process, is as follows:

- 1) **Effectiveness.** Is the alternative effective (would it respond to the purpose and need)?
 - a) Does the alternative provide year-round surface transportation access? (yes or no)
 - i) Factors to consider:
 - (1) Year round
 - (2) Surface access
 - b) Is the alternative feasibly and practically able to support mining exploration and development activities in the Ambler Mining District? (yes or no)
 - i) Factors to consider:
 - (1) Logical termini²
 - (2) Support hauling mining equipment and heavy loads
 - (3) Constructed length
 - (4) Distance to transportation network
- 2) **Technical Feasibility.** Is the alternative technically feasible?
 - a) **Constructability.** Would the alternative use proven construction methods and minimize construction risk by taking into consideration topography, poor soils, difficult river crossings, and access to construction materials? (yes or no)
 - i) Factors to consider:
 - (1) Topography
 - (2) Poor soils
 - (3) Difficult river crossings
 - (4) Access to construction materials
 - b) **Existing Technology.** Can the alternatives be accomplished using existing technology and equipment? (yes or no)
 - i) Factor to consider:
 - (1) Generally accepted design criteria for the intended mode of transportation and intended use
- 3) **Economic Feasibility.**³ Is the alternative economically feasible?
 - a) Are construction costs reasonable compared to other alternatives? (yes or no)
 - i) Factor to consider:
 - (1) Construction costs
 - b) Are operations and maintenance costs reasonable compared to other alternatives? (yes or no)
 - i) Factor to consider:
 - (1) Operations and maintenance costs
- 4) **Practicality.** Does the potential alternative require remote or speculative assumptions for implementation?
 - a) Does the alternative require speculative assumptions or remotely foreseeable circumstances? (yes or no)

² Based on cooperating agency input, the BLM determined that the logical termini for the project should be defined as a connection from the mining district to an existing port or to existing transportation infrastructure that leads to an existing port.

³ For the economic feasibility criterion, costs for alternatives were derived largely from the DOT&PF effort in 2011–2012 and the applicant’s materials. For alternatives not considered previously and therefore which did not have original cost estimate, costs were extrapolated from these existing data sources. Older costs were escalated to 2018 dollars. Growth rates were based on the Bureau of Labor Statistics Urban Alaska Consumer Price Index. Escalation rates used were as follows: from 2011 to 2018: 10.1 percent; from 2012 to 2018: 7.7 percent; from 2016 to 2018: 1.8 percent. Additional documentation regarding costs were also considered.

- i) Factors to consider:
 - (1) Speculative assumptions?
 - (2) Remotely foreseeable circumstances?
- b) Is the alternative practical using common sense? (yes or no)
 - i) Factor to consider:
 - (1) Common sense
- c) Does the alternative have unacceptable environmental impacts relative to other alternatives? (yes or no)
 - i) Factor to consider:
 - (1) Environmental data⁴ on caribou habitat crossed, anadromous fish stream crossings, and hydrologic conditions
- 5) **Duplication.** Is the alternative substantially similar in design to an alternative that is analyzed, or would it have substantially similar effects to an alternative that is analyzed?
 - a) Is the alternative substantially similar to one that is also being analyzed? (yes or no)
 - i) Factor to consider:
 - (1) Duplication
 - b) Is the alternative similar to (but not as good as) an alternative with similar routing or other key characteristics? (yes or no)
 - i) Factor to consider:
 - (1) Duplication

The screening criteria used for the Draft EIS were discussed during the cooperating agencies' alternatives development workshop in May 2023, and no new information or changed circumstances warranted changes to the existing screening criteria were identified. Therefore, these screening criteria remain valid for the Supplemental EIS.

5. Alternatives Considered*

NEPA requires consideration of a range of alternatives. BLM considered alternatives proposed by the applicant (AIDEA) in their application, some of which were routes originally investigated by the DOT&PF. BLM also considered the comments of the public and agencies, particularly received during the scoping process of the first EIS, including multiple comments related to alternatives. Each of these alternatives is briefly described below.

5.1. Applicant Alternatives

AIDEA, as the applicant, submitted two routes: a Proposed Route and an Alternative Route. Both are access roads that connect the Dalton Highway at Milepost (MP) 161 with the Ambler Mining District.

⁴ For the practicality criterion, environmental metrics used during screening included consideration of caribou habitat, anadromous fish streams, and hydrology related to stream crossings and riparian acreage, based on data from Alaska Department of Fish and Game (ADF&G) and the U.S. Geological Survey (USGS) (ADF&G 2018; USGS 2018). Environmental metrics for caribou habitat and anadromous fish stream crossings were calculated in June 2018 using GIS and based on a 250-foot-wide corridor (the applicant's proposed right-of-way width); in July 2018, riparian area was calculated based on a buffer of USGS' National Hydrography Dataset lines that intersected the 250-foot ROW. The 250-foot width represents a conservative estimate of impacts and would account for cuts and fills beyond the typical footprint, indirect (adjacency) impacts, and construction impacts. DOT&PF proposed a typical section for both road and rail alternatives that required a 32-foot top width, and they used the same centerline for their analysis. For this reason, the road impacts and the rail impacts calculated for this screening are identical. For alternatives that move forward, it is anticipated that more precise footprint impacts will be calculated.

The Alternative Route dips southward to take a different route through Gates of the Arctic National Preserve. Figure 2 illustrates these routes.

AIDEA Proposed Route (Gates of the Arctic National Park and Preserve [GAAR] North): The AIDEA Proposed Route is a 211-mile-long eastern alignment (accesses the Ambler Mining District from the east), with its eastern terminus at MP 161 of the Dalton Highway. It runs almost directly west to the Ambler Mining District across principally state, BLM, and Gates of the Arctic National Preserve lands.

AIDEA Alternative Route (GAAR South): The AIDEA Alternative Route is a 228-mile-long eastern alignment, with its eastern terminus at MP 161 of the Dalton Highway. It is the same as the AIDEA Proposed Route except that it loops to the south to pass through Gates of the Arctic National Preserve at the narrowest possible location. This adds 20 miles to the overall route length.

5.2. DOT&PF Previously Identified Alternatives (Corridors)*

DOT&PF had examined multiple routes (corridors) before the project was transferred to AIDEA, completing most of its work in 2011. The alternatives DOT&PF examined are shown on Figure 3 and include the following rail and road alignments:

- Original Brooks East Corridor – Road
- Kanuti Flats Corridor – Road
- Elliott Highway Corridor – Road
- Parks Highway Railroad Corridor – Rail
- Delong Mountain Transportation System (DMTS) Port Corridor – Road or Rail
- Cape Blossom Corridor – Road or Rail
- Selawik Flats Corridor – Road or Rail
- Cape Darby Corridor – Road or Rail

Original Brooks East Corridor (Road): The Brooks East Corridor is a 220-mile-long road alternative. It is an eastern alternative (approaches the Ambler Mining District from the east) and is the original basis for the AIDEA Proposed Route. It would upgrade a currently used seasonal ice road to the Bettles/Evansville area, including Evansville in the route. The route is hilly but not truly mountainous.

Kanuti Flats Corridor (Road): The Kanuti Flats Corridor is a 240-mile-long road alternative. It is an eastern alternative that starts with the Original Brooks East Corridor but diverges at Evansville and follows a flatter route westward, skirting south of Gates of the Arctic National Preserve.

Elliott Highway Corridor (Road): The Elliott Highway Corridor is a 370-mile-long road alternative. It is a southeastern alternative, with its southern terminus at the existing Elliott Highway. From there, it heads west (crossing the Yukon River), then heads north and west. Its final miles are the same as the Kanuti Flats Corridor. Its route is mostly the same as the Parks Highway Railroad Corridor.

Parks Highway Railroad Corridor (Rail): The Parks Highway Railroad Corridor is a rail alternative that splits at each end, providing 4 routes that vary between 420 and 450 miles long. It is a southeastern alternative, with its southern terminus at the existing Alaska Railroad at the Parks Highway, west of Fairbanks. From the Alaska Railroad, the route heads generally northwest, crossing the Yukon River, jogs north through a band of low mountains, then heads north and west to the Ambler Mining District. Its route is much the same as the Elliott Highway (road) Corridor.

DMTS Port Corridor (Road or Rail): The DMTS Port Corridor is a 260-mile-long road or rail alignment. It is a western alternative (approaches the Ambler Mining District from the west). DMTS refers to the DeLong Mountain Transportation System that connects the Red Dog Mine in western Alaska with a mining port on the coast west of Noatak. From the port, the route heads east-southeast and crosses Noatak National Preserve and Kobuk Valley National Park.

Cape Blossom Corridor (Road or Rail): The Cape Blossom Corridor is a 250-mile-long road or rail alignment. It is a western alternative, with its western terminus at Cape Blossom, south of Kotzebue, which has been identified as a potential port site. From Cape Blossom, the route heads southeast, then northeast, crossing Selawik National Wildlife Refuge.

Selawik Flats Corridor (Road or Rail): The Selawik Flats Corridor is a 330-mile-long road or rail alternative. It is a western alternative, with its western terminus at the Nome-Council Road, which leads to Nome, where there is an existing shallow water port and a reasonably foreseeable deep water port. From the Nome-Council Road, the route heads northeast across the Seward Peninsula and Selawik National Wildlife Refuge. Most of the route is the same as the Cape Darby Corridor.

Cape Darby Corridor (Road or Rail): The Cape Darby Corridor is a 340-mile-long road or rail alternative. It is a western alternative, with its western terminus at Cape Darby, which has been identified as a potential port site. From Cape Darby, the route heads northeast, crossing the base of the Seward Peninsula and the Selawik National Wildlife Refuge. Most of the route is the same as the Selawik Flats Corridor.

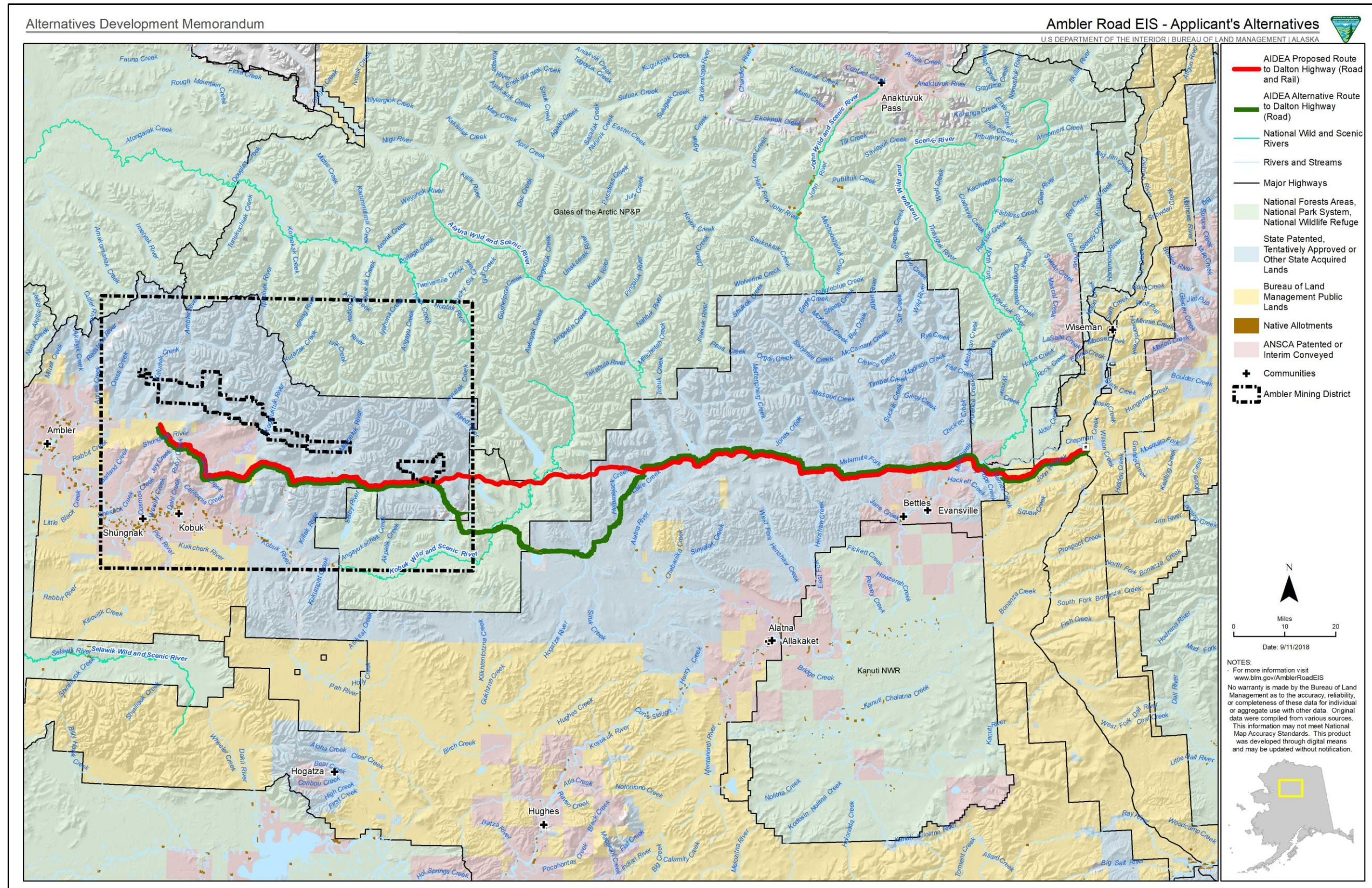


Figure 2. Applicant's proposed alternatives

Source: AIDEA SF 299

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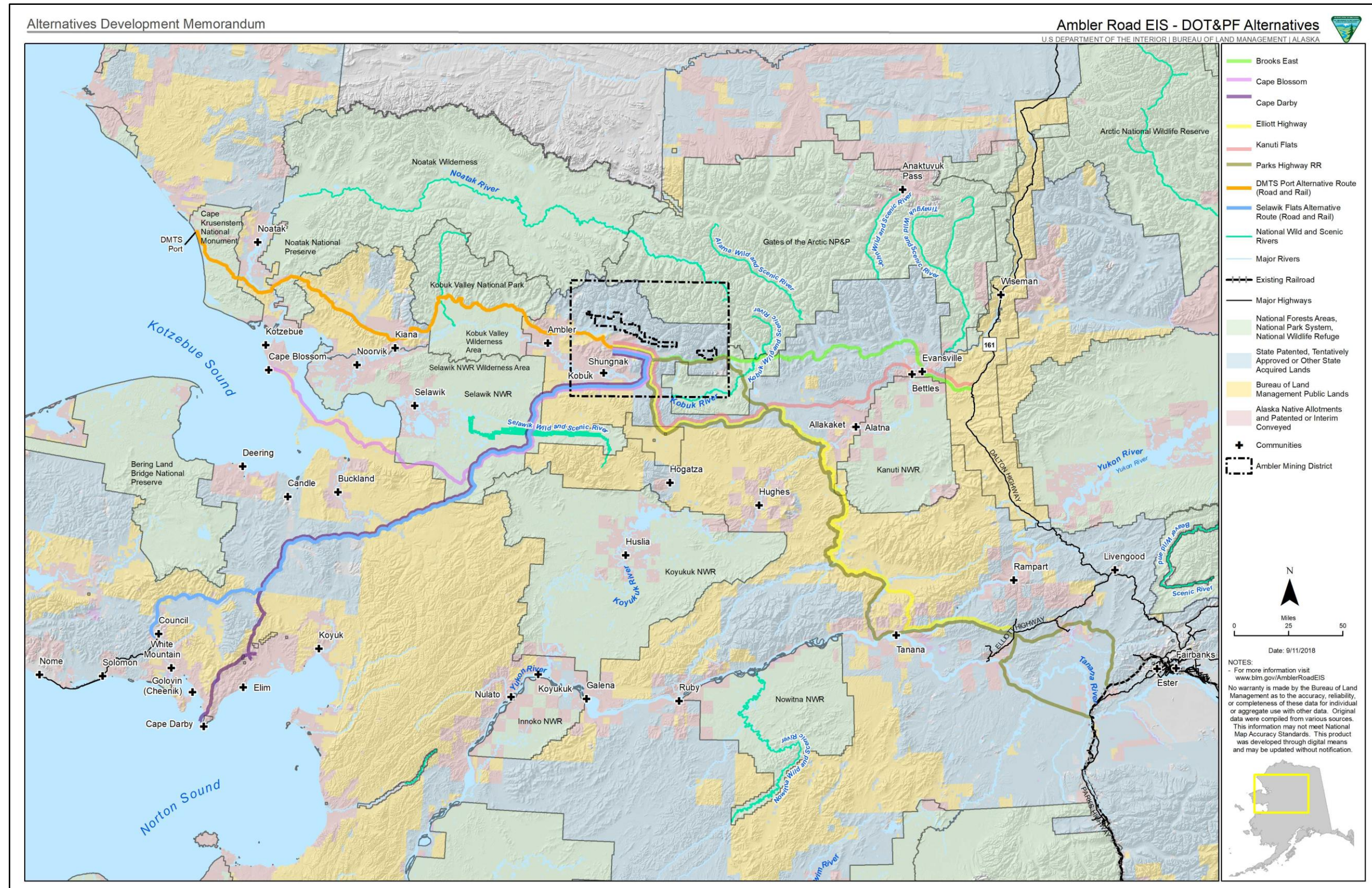


Figure 3. DOT&PF previously studied routes

Source: DOT&PF. September 2011. Corridor Development Memorandum. Ambler Mining District Access and AIDEA SF 299

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5.3. Alternatives Identified During Scoping and Post-Scoping*

The 2017–2018 scoping process undertaken by the BLM for the 2019 Draft EIS generated comments related to alternatives. The BLM also held a 45-day public scoping comment period to solicit public input on the Ambler Road Supplemental EIS, which generated additional comments related to alternatives. Public comments related to alternatives from both the Draft EIS and Supplemental EIS scoping periods are compiled in Appendix A of the Draft Supplemental EIS. Based on these comments during scoping and the alternatives development/screening phase, the BLM identified several mode alternatives, several road or rail routes, and other conceptual alternatives.

Commenters noted road or rail routes but often did not specify a location or route, for example, “west to the coast” as a general route suggestion. Given that DOT&PF had already identified several routes west to the coast and that these had engineering behind them, BLM did not undertake to create new alignments based on such comments, although it did consider some potential refinements to the DOT&PF routes based upon comments. Figure 4 illustrates these routes.

Additional alternatives/concepts gleaned from public and agency scoping comments and other input during the Draft EIS and Supplemental EIS processes are as follows, with alternatives discussed during the Supplemental EIS process indicated with an asterisk:

- Kobuk River Routes/Concepts
 - A route down Kobuk River to tidewater
 - An ice road to lower Kobuk River
 - A shorter road to Kiana, then barge on Kobuk River; truck-to-barge mode in general
 - Improvements (dredge) to Kobuk River for barge access
 - Kobuk River crossing(s) moved downstream of Pah River confluence
- Southwest Routes/Concepts
 - Variations on Selawik Flats/Cape Darby corridors that access other resources
 - A variation of the Selawik Flats route (referred to as the Nome route in this document; note this specific route was suggested after the scoping period had concluded)
- Southeast Routes/Concepts
 - A Tanana-Hughes-Hogatza-Kobuk alignment (in this document called the Communities Route)
- Gates of the Arctic National Preserve Routes/Concepts
 - Variations to reduce airfields and other features within GAAR
 - More route options crossing GAAR
- Variations on Proposed Routes/Other Connections to Dalton Highway
 - Rail to Dalton Highway by any route (implies ore would transfer to trucks at highway)
 - A route across the Alatna River and up Helpmejack Creek
 - More take-off points from Dalton Highway
 - A more southerly route tying directly to national park southerly route
- Other Concepts (suggestions for alternatives that were not described sufficiently to map)
 - A route “close to villages”

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- A seasonal road with ice bridges only*
- “Heavy haul” road design (implies oversize mining vehicles, not just street vehicles)
- One-lane road with passing areas and traffic-tracking software
- Variations on phasing, or no phasing, of construction*
- Variations on placements of airstrips
- Variations on ROW ownership
- An elevated rail—a concept generally described by a University of Alaska engineering professor—that was included in internal scoping at BLM
- Existing infrastructure and traffic routing (e.g., truck or rail to Port MacKenzie or Seward)

- Pipelines for fuel import and concentrate export, coupled with air transport for personnel*
- A route developed to have least possible impact on subsistence*
- Tanana Chiefs Conference’s (TCC’s) alternative developed with traditional/local knowledge, termed in their letter the “Tribal Alternative”*
- Use of air transportation only for specific phases of exploration, construction, or operations*
- An alternative with increased mitigation measures*

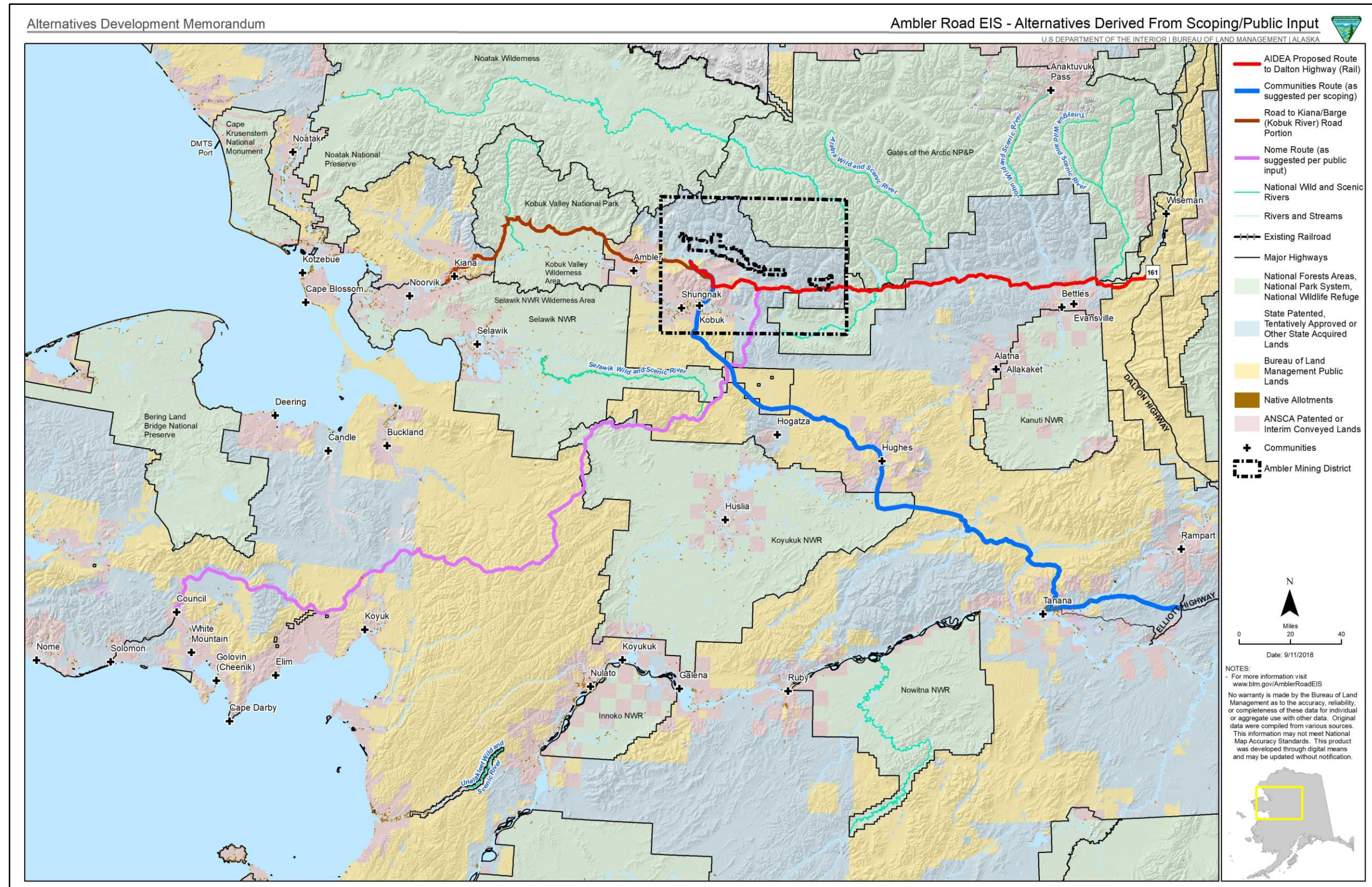


Figure 4. Alternatives derived from public input

Source: Prepared by HDR based on EIS scoping comments and other input received by BLM.

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5.4. Cooperating Agency Input on the Potential Range of Alternatives*

The cooperating agencies discussed the various concepts and routes proposed in the Draft EIS scoping comments at a meeting in Fairbanks on April 12, 2018. Based on this discussion, the BLM made the following decisions:

- The routes to be considered should provide year-round access based on the statement of purpose and need.
- Logical termini for the project alternatives considered should be defined as a connection from the Ambler Mining District to an existing port or to existing transportation infrastructure that leads to an existing port.

In developing alternatives for this Supplemental EIS, the BLM held a cooperating agencies' alternatives development workshop May 9–10, 2023. The BLM and cooperating agencies re-examined alternatives/concepts that were proposed during the previous EIS process and worked to develop new alternatives/concepts that would reduce overall potential impacts, especially impacts to subsistence use and resources, including habitat.

Alternative options considered during the cooperating agencies' alternatives development workshop included the reasonableness of a road or railroad route to the west, terminating at a port site in Nome; alternative modes of transportation that could be used during Phase 1 to support exploration, including aircraft or ice roads; combining the proposed phases of construction; a road/pipeline corridor alternative that consists of both a road and double pipeline (for fuel and flotation concentrate slurries) adjacent to the road; and a Tribal Alternative that was proposed by TCC during scoping for the Supplemental EIS.

The following provides a brief summary of the input related to each of the corridors introduced during the Draft EIS and Supplemental EIS scopings as described above.

Kobuk River Routes/Concepts: Previous agency discussion of the Kobuk River routes noted that barging and ice roads are not year round, not practical, and would have unacceptable impacts if dredging for additional river depth were part of the alternative. To be responsive to scoping comments, the BLM's determination was to include a road-to-barge alternative and a road alternative in the Kobuk River corridor for screening.

Southwest Routes and Concepts: Based on previous agency discussion and map inspection, it was determined that other mining districts to the southwest were near enough to the alignments DOT&PF had examined that those routes already could be considered to provide reasonable access to those districts. The BLM's determination was to not include any additional routing or variation in the southwest/Seward Peninsula area as it would be duplicative to routes that already had considerable engineering consideration in their development. Subsequent to scoping and the April 12, 2018 cooperating agency meeting, the BLM received an additional public request to consider a specific variant to the southwest, which became known as the Nome route. The BLM incorporated this route for consideration in the screening process.

Southeast Routes and Concepts: The BLM previously determined that an alternative that better incorporated the communities of Tanana, Hughes, Hogatza, and Kobuk had a sufficiently different routing than those evaluated by DOT&PF/AIDEA and that it warranted screening. This alternative was labeled the Communities Route.

Gates of the Arctic National Preserve: Previous discussion about reducing airfields and gravel sources within the National Preserve resulted in a determination that these were design variations or impact topics to be evaluated in the EIS but were not distinct alternatives needing screening

Variations on the AIDEA Proposed Route: Previous discussion resulted in a determination that scoping suggestions for other alignments and variations on AIDEA's Proposed Route were too vague to be considered distinct alternatives for screening. However, a rail connection to the Dalton Highway was not previously evaluated and was suggested for screening.

TCC's Tribal Alternative: During the public scoping period for the Ambler Road Supplemental EIS, the BLM received an extensive and detailed comment letter from TCC. In their letter, TCC specifically requested the BLM consider a Tribal Alternative which was elaborated upon during the alternative development workshop.

TCC's alternative as described in the TCC letter would maximize protection by modifying the route and incorporate other design features to prevent direct, indirect, and cumulative impacts on subsistence and cultural resources. Such an alternative would minimize reliance on unproven and ineffective mitigation measures to protect subsistence and cultural resources.

During the workshop held May 9–10, 2023, TCC (a designated representative for the federally recognized Tribes of Alatna, Evansville, and Tanana) provided additional information and context regarding the proposed alternative, explaining that under the proposed alternative, the BLM would delay preparation of the Supplemental EIS until after the ANILCA Section 810 analysis and NHPA Section 106 process were completed and a new route alternative would be crafted in coordination with the Tribes taking into consideration the findings of the ANILCA Section 810 analysis and NHPA Section 106 process. Under TCC's proposal, such a new route alternative would then be analyzed in the Supplemental EIS and might offer greater protections for subsistence and cultural resources than the other alternatives analyzed in the Supplemental EIS.

However, the ANILCA Section 810 analysis cannot be completed for an alternative route prior to the alternative route being identified, as it would not have a frame of reference for the analysis, nor can it be completed outside the EIS process because Section 810(b) of ANILCA requires that the Section 810 analysis be completed as part of the EIS. In this regard, ANILCA Section 810(b) states, "If the Secretary is required to prepare an environmental impact statement pursuant to §102(2)(C) of the National Environmental Policy Act, he shall provide the notice and hearing and include the findings required by subsection (a) as part of such environmental impact statement." Additionally, in order to determine whether or not an alternative is reasonable, the BLM applies screening criteria. Because the proposed Tribal Alternative as presented does not describe a route but instead a process for creating a new route or adjusting a current route, this Supplemental EIS is unable to properly screen it to determine whether it is technically or economically feasible, or whether it meets the stated purpose and need.

The Programmatic Agreement (PA) prepared pursuant to the Section 106 process initiated with the original EIS requires the identification of archaeological, historic, and ethnographic resources within the identified area of potential effect. The identification of these resources requires consultation with tribes and local governments, including Alatna Village Council, Allakaket Village Council, City of Allakaket, City of Anaktuvuk Pass, Dinyea Corporation, Evansville Village, Evansville, Inc., Hughes Village Council, Huslia Village Council, Native Village of Kobuk, Native Village of Noatak, Native Village of Selawik, Native Village of Stevens, Native Village of Tanana, Northwest Arctic Borough, Noorvik Native Community, and Village of Anaktuvuk Pass. Per the PA, "The BLM shall ensure adverse effects 648 to historic properties are assessed per 36 CFR 800.5 and resolved through avoidance, 649 minimization, or mitigation, per 36 CFR 800.6" Once these resources are identified, they will be assessed

per 36 Code of Federal Regulations 800.6, and any adverse effects to those resources determined to be historic properties will be resolved through avoidance, minimization, or mitigation, which will also be determined through extensive consultation with tribes and local governments.

Avoidance is the first tool used in resolving adverse effect to historic properties. As stated in the PA, “To the extent practicable, the Permittee will develop or modify Project design and construction methods to avoid historic properties.” This includes potential rerouting of the road. If that is not practicable, then the next two resolution processes of minimization or mitigation for cultural resources will be applied.

Ultimately, the process (i.e., incorporating Indigenous Knowledge and consulting with tribes in identifying potentially impacted cultural resources and modifying the route) and factors (i.e., including timing and area restrictions during critical time periods such as caribou migration, fish spawning, and peak subsistence harvesting; avoiding gravel mining in streambeds and other fish habitat; considering renewable energy for the project’s electrical supply; and including tribes in oversight and enforcement of stipulations) that are specifically recommended in TCC’s Tribal Alternative are considered potential mitigation in the NEPA context. Therefore, the recommendations presented in TCC’s Tribal Alternative will be carried forward as potential mitigation during the impact analysis in Chapter 3. While the BLM can only enforce mitigation not resulting from the Section 106 process on BLM land, the process and factors recommended in TCC’s Tribal Alternative would also be considered as potential avoidance, minimization, and mitigation measures within the PA process and, if adopted, would apply throughout the entire project, regardless of land ownership.

Variations on phasing, or no phasing, of construction: Discussion during the Draft EIS alternatives process in 2018 of modified phasing options resulted in a determination that combining Phases 1 and 2 would be a reasonable option that could apply to any of the action alternatives, but condensing all 3 phases would not. Much of the infrastructure for Phase 2 would already be constructed as part of Phase 1. Most notably, culverts would be placed in Phase 1 at the size and length needed for Phase 2, and bridges would be placed in Phase 1 and would function for all subsequent phases. Additionally, Phase 2 would not involve removing anything placed in Phase 1. While Phase 2 would include a 4-foot expansion of the road width, it would also include construction of a thicker road embankment that would be more effective insulation and would mitigate potential impacts to permafrost, water quality, and fish as compared to the roadbed associated with Phase 1. A reduction in impacts related to permafrost, water quality, and fish and related to the consolidation of 2 construction phases into 1 potentially outweighs the impact of the footprint increase associated with Phase 2, even if Phase 2 is not ultimately necessary to support mining operations in the Ambler Mining District.

During a cooperating agencies Supplemental EIS alternatives development workshop held May 9–10, 2023, discussion of the modified phasing concept revealed that combining Phase 1 and 2 is consistent with special condition number 13 of the USACE’s CWA Section 404 permit for the project, which specifies, “The permittee shall construct the road to Phase II standard embankment depths in areas with thaw sensitive permafrost soils and in emergent wetlands, without first constructing the pioneer road.” Therefore, consolidation of Phases 1 and 2 was identified as an option retained for detailed analysis under each of the action alternatives in the Supplemental EIS. The difference between the USACE’s special condition and the combining of Phases 1 and 2 as proposed is that combining Phases 1 and 2 would apply to the entire route and would not be limited to areas with thaw-sensitive permafrost soils or emergent wetlands.

Use of air transportation only for initial exploration and construction phases: During the cooperating agencies’ Supplemental EIS alternatives development workshop, some cooperators suggested that the BLM consider analyzing an alternative that allows air transportation only for initial mineral exploration or early phases of construction, and not allow development of the road until later construction phases, or

possibly until after mining proposals have been realized. During the discussion, a point made in favor of this alternative concept was that it could reduce subsistence and surface water impacts, and points made against it were that it would require the development of landings to facilitate air access and would not meet the purpose and need statement to provide “year-round industrial surface transportation access in support of mining exploration and development.” Some cooperators questioned whether the purpose and need statement could be modified to eliminate the need for surface transportation access for the exploration phase.

As previously stated in Section 3, Purpose and Need, of this alternatives memorandum, the BLM reviewed the purpose and need for the Supplemental EIS and made no changes. The BLM’s purpose and need element that allows for “year-round industrial surface transportation access” would not be met and so it was eliminated from further consideration.

Pipeline/road combination: During the cooperating agencies’ Supplemental EIS alternatives development workshop, the U.S. Environmental Protection Agency suggested that the BLM evaluate a pipeline/road combination alternative. Under this alternative, pipelines would be developed adjacent to the road corridor to transport fuel (e.g., diesel or liquified natural gas) into the Ambler Mining District and transport flotation concentrate slurries out of the Ambler Mining District to either the Dalton Highway or Nome, depending on the chosen route’s terminus. The proposed road would foreseeably be used for other transport needs (supplies, equipment, people).

This pipeline alternative is conceptual and would therefore require several assumptions about the pipeline’s design, start/end points, and required ancillary facilities such as pumpstations in order to screen this alternative using the BLM’s criteria. Construction of an aboveground fuel pipeline adjacent to the road would increase the width of the project corridor and the overall acreage of ground disturbance needed for the project. An ore concentrate pipeline could feasibly be placed within the roadbed, however the technical requirements of transporting concentrate through a buried pipeline for 200-plus miles over a relatively steady grade is unknown. At a conceptual level, the BLM recognizes that the pipeline/road alternative would provide a benefit of reducing truck traffic relative to the proposed action, which in turn would reduce some of the potential effects of heavy truck traffic on air, wildlife, and subsistence resources. The number of truck trips that could be reduced by this alternative are estimated in Appendix H of the original EIS (Indirect and Cumulative Impacts Associated with the Ambler Road), which evaluated the environmental effects of the mining development scenario anticipated to result from development of the proposed Ambler Road. Based on the trip estimates in Appendix H (Section 2.1.4, Reasonably Foreseeable Mine Development Scenario; Table 2-5), there would be approximately 36 daily trips for fuel deliveries and approximately 306 daily trips for the transport of ore concentrate (including 102 double-trailer trips and 204 single-trailer trips) generated by 4 major anticipated mining operations on the Ambler Road (based on the projected use and development of the mining district). Therefore, an approximate maximum of 342 daily trips could be avoided with this alternative, using these 4 major mining operations as representative examples of what operational use levels would be for the life of the project.

The BLM also recognizes that the construction and operation of a pipeline would result in additional adverse environmental effects relative to the proposed action, such as presenting new types of barriers to wildlife movement from the aboveground pipeline and increasing the acreage of disturbance to wildlife habitat, permafrost soils, and wetlands. Although some types of effects to wildlife would be reduced by the pipeline addition (e.g., reduced roadway noise and potential for collisions), the physical presence of the road and pipeline infrastructure would still disturb habitat, deter wildlife, and present movement barriers. Given the connection between wildlife habitat and subsistence uses, which are the focus of the remand, the benefits of this alternative would not outweigh the drawbacks associated with the increased habitat disturbance and movement barriers.

In terms of economic feasibility, one of the BLM's alternative screening criteria, construction of a pipeline in addition to the road, would also significantly increase the cost of construction, which would make this alternative less economically feasible compared to the proposed action.

The Ambler Road Final EIS found that during construction of the project, particulate matter (e.g., dust) would be the main air pollutant of concern and construction vehicles and equipment would emit greenhouse gases (Section 3.2.7, Air Quality and Climate, of the Final EIS). The suggested alternative would increase the footprint of ground disturbance and would also likely increase the duration of construction, resulting in greater air emissions associated with the construction phase. The Final EIS also found that during operation of the project, vehicle traffic on the road would result in dust and criteria pollutant and hazardous air pollutant emissions; however, none of the action alternatives are expected to cause exceedances of any ambient air quality standards, and localized air quality impacts would be minimized with the successful implementation of operator-committed dust control measures (see Section 3.2.7, Air Quality and Climate, of the Final EIS). Therefore, while the suggested alternative would reduce operational traffic and air emissions, it would do so at the expense of increased physical disturbance to wildlife habitat, permafrost soils, and wetlands.

Other Concepts: Previous discussion of alternatives related to the other concepts noted in the bulleted list in Section 5.3, Alternatives Identified During Scoping and Post-Scoping, of this alternatives memorandum (most of which could not be mapped), resulted in a determination they were ambiguous or duplicative to routes already being considered. The concepts from scoping often were vague or about process. For example, input already has been given by communities/tribes that has resulted in alignment changes. Pipelines would not serve exploration or fully meet the project needs (e.g., a pipeline would not be able to move equipment or support mining exploration). The BLM did determine, however, to consider the elevated rail mode in the screening process and to retain a consolidated phasing option for detailed analysis under each of the action alternatives. None of the other conceptual scoping ideas warranted inclusion as an alternative method of meeting the purpose and need.

Based on the discussion with the cooperating agencies and review of previously studied routes, the BLM previously determined that 4 additional alternatives suggested during scoping warranted screening. The following provides additional information on these 4 routes.

Rail to Dalton Highway: The Rail to Dalton Highway route is a 211-mile-long rail alternative. It is an eastern route—it was assumed to follow the approximate alignment of the AIDEA Proposed Route (acknowledging it may need to vary from this route in places to achieve grades that can be traversed by trains). The route's eastern terminus is the Dalton Highway, and it runs almost directly west to the Ambler Mining District. This alternative assumes any mining ore would transfer from trains to trucks at the Dalton Highway. From there, the transport would occur in the same manner as the Proposed Route.

Route along Kobuk River to Tidewater: The route along the Kobuk River is an approximately 150-mile-long (no alignment was proposed, so no firm length was calculated) road alternative. It is a western route, with its western terminus at "tidewater," near the mouth of the Kobuk River. There is no existing port in the vicinity; the nearest port is the DMTS port, which is the terminus of the DMTS Port Route. The suggested route is assumed to roughly parallel the Kobuk River.

Road to Kiana Area, then Barge via Kobuk River: This alternative would include a road route to the Kobuk River near the village of Kiana and the barging/lightering of materials from there to an off-shore location where ocean going vessels would moor. The BLM used the DMTS route to the vicinity of Kiana on the Kobuk River because that route had been engineered by DOT&PF. No engineering has been completed on the short segment from the DMTS route to the Kobuk River; however, it appears feasible based on inspection of topographic maps. From the Kiana area, it was assumed that barge traffic would

operate seasonally on the Kobuk River and would continue across Hotham Inlet to Kotzebue Sound, where ore ships could anchor offshore in deeper water as ships do today to serve Kotzebue (15 miles off shore). Ore ships operate similarly farther north at the DMTS port (where ore ships anchor 3 miles off shore and materials are lightered to and from shore). The mapped road portion would be approximately 149 miles long. The Kobuk River has multiple channels and many oxbows; the river mileage is estimated at 60 miles. The additional water distance to an anchorage off of Kotzebue could be up to an additional 50 miles.

Communities Route: Because no alternative had been previously delineated, the BLM drafted a generalized route for this alignment. The Tanana-Hughes-Hogatza-Kobuk route is a 306-mile-long road alternative. It is a southeastern alternative, with its southern terminus at the existing Elliott Highway. From there, the route follows the DOT&PF Elliott Highway Route westward across the Yukon River, then northwest. It diverges from that route, however, to stay farther west, winding through Hughes, north of Hogatza, and ending near Kobuk. Because of mountainous topography, it crosses a corner of the Koyukuk National Wildlife Refuge, although the BLM is assessing whether it is feasible to route this potential alternative to avoid the refuge.

5.5. Conclusion – Range of Alternatives for Screening

BLM considered the full spectrum of ideas generated during public scoping and internal scoping with cooperating agencies and identified modes and routes that constitute the range of alternatives to be screened. The ideas and alternatives include the following modes:

- Road
- Standard rail
- Blimp/dirigible
- Pipeline
- Elevated rail
- Narrow gauge rail
- Ice road
- Barge/road to barge

The BLM determined that the applicant's proposed route and alternative route, the road and rail alignments considered by DOT&PF, and several routes and concepts suggested by the public during and after scoping should undergo screening. The range of potential routes includes the following:

Routes Proposed by Applicant

- AIDEA Proposed Route (GAAR North)
- AIDEA Proposed Alternate Route (GAAR South)

Routes Studied By DOT&PF

- Original Brooks East Corridor – Road
- Kanuti Flats Corridor – Road
- Elliott Highway Corridor – Road

- Parks Highway Railroad Corridor – Rail
- DMTS Port Corridor – Road or Rail
- Cape Blossom Corridor – Road or Rail
- Selawik Flats Corridor – Road or Rail
- Cape Darby Corridor – Road or Rail

Routes Suggested During Scoping

- Rail to Dalton Highway along AIDEA’s Proposed Route (GAAR North)
- Road Route along Kobuk River to Tidewater
- Road to near Kiana, then Barging Down the Kobuk River
- Communities Route (Tanana, Hughes, Hogatza, Kobuk) - Road
- Nome Route (a Selawik Flats variant) – Road

No additional modes or routes were identified from the public during scoping or through cooperating agency input on the Supplemental EIS.

6. Alternatives Screening

6.1. Process Overview*

The original screening process undertaken for the Draft EIS was broken into 2 phases: an initial screening of transportation modes and a secondary screening of routes associated with the reasonable modes. This was an iterative process, based in large part on scoping comments received, input from cooperating agencies, and review of available data. Many of the scoping comments related to alternatives that were not specific about a location for an alternative, but instead identified perceived advantages of modes other than automobile-based transportation, such as standard aircraft, dirigibles, standard and narrow gauge railroad, elevated railroad, barge transportation, and pipelines. Screening first examined these modes to see which were reasonable to advance, with the idea that location information (engineering route detail) could be applied to those modes that moved past the first screening.

The second screening pertained to those modes that were found potentially reasonable based on the criteria. Only road and rail modes were determined reasonable (see analysis in Section 6.3, Mode Screening Results, of this alternatives memorandum). Where necessary, engineering information that had been developed in detail for DOT&PF alternatives was used to evaluate new routes to a level sufficient for screening. Routes were delineated based on topographic maps and aerial photographs. Construction costs were based on DOT&PF’s estimated costs per mile of other road and rail alternatives in similar terrain. Costs done several years ago were all escalated to the same year (2018).

In both screenings, draft data were displayed in large matrices (spreadsheet tables) for discussion with cooperating agencies and for internal BLM consideration. Following a meeting with cooperating agencies, the matrices were revised, and BLM made initial decisions about which alternatives would be carried forward for further analysis and which were not reasonable and would not be carried forward.

Additional data were reviewed to help further screen the alternatives.⁵ Final summary matrices appear in Attachment B, Modes Screening Data, and Attachment C, Routes Screening Data, of this document.

In developing the Supplemental EIS, the BLM utilized the same screening process that was originally developed for the Draft EIS and applied it to any alternatives brought forward for rescreening.

6.2. Cooperating Agency Input on Alternatives Screening*

Agencies previously met in Fairbanks on April 12, 2018, and in Anchorage on May 2, 2018, to review changes to the statement of purpose and need, review changes to the screening criteria, discuss the range of alternatives, and review and provide input on drafts of the screening matrices. Relevant points from the discussion include the following:

- Narrow gauge rail may be considered a variation on the rail mode rather than a separate alternative. Agencies noted narrow gauge rail is used in mining applications around the world and has design criteria that lend it to tighter curves and steeper grades. Agencies felt it should pass through the mode phase of screening.
- “Egregious environmental impact” should be added as a criterion. Based on the input, BLM did add a criterion for unacceptable environmental impact relative to other alternatives.
- Some agencies felt that a “year-round” requirement makes ice roads and barges impractical, and such modes would not satisfy the purpose and need. It was not clear how “year round” should be applied to ports that ice over. The participants expressed a need to further understand if there is a necessity to have access to a year-round port in addition to a year-round road, especially considering that the DMTS port, also owned by the applicant, operates seasonally and is touted by the applicant as the road-operating model on which this project is based.
- There is a need to better understand the necessity for a “deep water” port versus lightering loads from ships anchored offshore.⁶ DOT&PF considered deep water ports (e.g., Cape Blossom and Cape Darby) and shallow draft ports that rely on lightering (e.g., DMTS and Nome). The Northwest Arctic Borough noted that the Kobuk River is too shallow to support mining operations, and that even the shallow draft barges that operate there now often cannot get through.

In terms of specific modes, the cooperating agency meetings resulted in general agreement on the following points:

- Year-round roads, standard rail, and narrow gauge rail modes appeared to be reasonable modes for further consideration.
- Air modes do not constitute “surface transportation” as specified in the statement of purpose and need and therefore are not reasonable. Dirigibles are unproven technology in arctic conditions.
- The elevated rail concept is based on an unproven technology in arctic conditions, is very expensive, and is likely not practical.

⁵ Available wetlands data was reviewed and determined by the BLM and the USACE to be insufficient for screening purposes due to its coarseness and inaccuracy. Existing documentation regarding ports and mining district activity was reviewed and independently assessed in regard to the logical termini, economic feasibility and practicality criteria.

⁶ As part of the alternatives screening process, the BLM concluded that they did not need to determine if having a shallow water port would result in an alternative being screened out for not having a logical terminus. While deep water ports were considered during the logical termini discussions, alternatives connecting to a shallow water port were eventually screened out for other additional reasons.

- Seasonal winter ice roads and barging are not “year-round” transportation as specified in the statement of purpose and need.
- Pipelines, while they might be useful for transporting fuel or ore slurry, would not support the need for hauling equipment and supplies.

In terms of specific routes, the cooperating agency meetings resulted in the following general agreement regarding routes:

- Rail access to the Dalton Highway may be difficult to screen out at this point.
- The Original Brooks East Route is largely duplicative of the AIDEA Proposed Route, but AIDEA’s Proposed Route avoids impacts to communities.
- The Cape Darby Route does not connect to an existing port. It would be speculative to assume a port would be developed at Cape Darby.

The BLM held a cooperating agencies’ Supplemental EIS alternatives development workshop, where agencies re-examined alternatives concepts that were proposed during the previous EIS process and discussed new alternatives. Options discussed during the workshop included the reasonableness of a route to the west terminating at a port site in Nome; alternative modes of transportation that could be used during Phase 1 to support exploration, including aircraft or ice roads; combining the proposed phases of construction; a road/pipeline corridor alternative that consists of both a road and double pipeline (for fuel and flotation concentrate slurries) adjacent to the road; and a Tribal Alternative that was proposed by TCC during scoping for the Supplemental EIS. This Alternatives Development Memorandum has been revised to reflect the outcome of cooperating agency input on the Supplemental EIS range of alternatives and to document the BLM’s rationale for rescreening and excluding from or including for detailed analysis modes or routes in the Supplemental EIS.

6.3. Mode Screening Results

This section describes BLM’s rationale for screening out some mode alternatives as not reasonable and carrying others forward to the second level of screening. BLM took all available information (e.g., matrices, scoping comments, cooperating agency input, and applicant material) into consideration. The results are presented below as summary lists, with detailed explanation following. This section should be read in conjunction with the mode screening matrix information presented in Attachment B of this document.

6.3.1 Modes Eliminated*

Modes eliminated from further consideration:

- Seasonal ice road
- Elevated rail
- Standard aircraft
- Dirigible
- Barge
- Pipeline

Air (airplanes/helicopters): Standard air access—airplanes or helicopters using runways or helipads—was discussed in depth by cooperating agencies, focusing on whether it could be available as an

alternative for Phase 1 mineral exploration only, given that exploration supported by air has currently occurred within the District. The intent of the applicant's purpose and need is to support expanded exploration throughout the Ambler Mining District. Air access would require assumptions about whether this mode would be effective in support of mining operations. Because operating costs were noted as excessive and unreasonable given the loads in question, this mode would not be practical. Additionally, air transportation would not provide surface access, thereby not meeting the purpose and need for the proposed action. However, given that current mineral exploration is primarily supported by air since there is no road access to the District, the BLM decided that additional information regarding the past, present, and reasonably foreseeable use of aircraft for mineral exploration would be added to the analysis of the No Action Alternative and cumulative effects in the Supplemental EIS. Key considerations included:

- Purpose and Need: Does not meet purpose and need because it does not provide surface access.
- Purpose and Need: Does not meet purpose and need because it does not reasonably support hauling heavy mining equipment and heavy loads.
- Technical Feasibility: Not technically feasible given the anticipated loads and equipment needed to be hauled.
- Economic Feasibility: Has economic challenges. High numbers of flights at high costs would be necessary because of the small load capacity of planes compared to truck or rail modes.
- Practicality: Not practical using common sense and because it requires speculative assumptions. Aircraft are not suitable for the kinds of hauling needed; it would be highly speculative to believe mines would be able to develop if dependent on this mode.

Air (blimp/dirigible): This mode was previously screened out for similar reasons as standard aircraft service, plus additional speculation and risk related to untested technical feasibility for mining support purposes in an arctic environment. Purpose and Need: Does not meet purpose and need because it does not provide surface access.

- Technical Feasibility: Technical feasibility is questionable. Heavy lift dirigibles supporting mining in the arctic do not have generally accepted design criteria.
- Practicality: Not practical using common sense and because it requires speculative assumptions. Requires speculation that an untested mode, in a dark, harsh arctic environment, would be safe and reliable. An untested mode in the unique environment of the project area is not reasonable using common sense.

Rail (elevated rail): This mode was previously screened out because of the speculative and untested technical feasibility of the concept in arctic environments and because of anticipated very high construction costs of what would amount to building a continuous bridge that could be in excess of 200 miles long. Where standard rail construction might cost approximately \$6 million/mile, elevated rail capable of hauling mining loads was estimated to cost in excess of \$100 million/mile. Technical Feasibility: Not technically feasible. There are not established design criteria for this technology in arctic conditions.

- Economic Feasibility: Not economically feasible. Consultant engineers estimated this technology could cost in excess of \$100 million/mile.
- Practicality: Not practical using common sense and because it requires speculative assumptions. Requires speculation that an untested mode, in a dark, harsh arctic environment, would function well. The high cost and unproven technology in arctic conditions make it not practical using common sense.

Road (seasonal ice road): This mode was previously screened out because an ice road would not provide year-round surface access and therefore would not satisfy the project purpose and need. An ice road concept was noted as unreliable in the face of a warming climate. Operations and maintenance were noted as not reasonable because potentially greater than 200 miles of new road would need to be built each winter. Therefore, an ice road was deemed not practical. This mode was also discussed by cooperating agencies during a workshop held for the Supplemental EIS, including this use of snow trails in conjunction with ice bridge crossings at rivers. Given that the applicant proposes to utilize seasonal ice roads and trails during the first phase of construction of the road, the BLM decided that additional information regarding the impacts of seasonal ice roads or trails would be added to the actions common to all alternatives analysis in Chapter 3 of the Supplemental EIS.

- **Purpose and Need:** Does not meet purpose and need because it does not provide year-round access. Moreover, it is questionable as to whether river crossings can provide reliable access to support mineral exploration and development given changing climate conditions. Heavy loads require stable, consistent ice conditions.
- **Technical Feasibility:** Technical feasibility is questionable. There are not established design criteria for constructing ice roads that support heavy mining operations.
- **Ice roads of this length are not practical;** changing climate conditions make reliability of ice roads speculative and therefore not practical.
- **Economic Feasibility:** Not economically feasible. Constructing new ice roads each year is not economically feasible. It is reported that ice road construction and maintenance on the North Slope costs \$1 million/mile/year. Furthermore, limiting surface access to the mining district to only a portion of the year does not meet the applicant's need for year-around access.
- **Practicality:** Constructing an ice road of the required length each winter is not practical using common sense and is not economically feasible.

Water (barge/boat)⁷: This mode was previously screened out because a water-only route would not provide "year-round" surface access and therefore would not satisfy the project purpose and need. The Kobuk River would be too shallow for reliable seasonal access and/or would require dredging; other routes were not identified. The impacts of dredging would also make this mode not practical for environmental reasons, and the alternative was screened out during the original EIS screening process primarily based on purpose and need issues.

- **Purpose and Need:** Does not meet purpose and need because it does not provide year-round access.
- **Technical Feasibility:** Technical feasibility is problematic. Rivers near the Ambler Mining District are too shallow for barges hauling the kinds of materials anticipated, which would require dredging. Dredging raised unacceptable environmental concerns for cooperating agencies.
- **Practicality:** Changing climate conditions require speculation that water levels will remain constant over time, introducing technical feasibility issues and making barge modes not practical based on the necessary speculating.

Pipeline: This alternative was previously screened out because it would not support the required hauling and would not be practical on its own. A system of pipelines could, in theory, carry fuel into the Ambler

⁷ Road to Kiana Area, then Barge via Kobuk River. This combination road/barge alternative was forwarded to the second level screening because it had a relatively long roadway component that would have been year round. To give this idea a hard look, BLM conducted additional analysis. In the end, however, it was eliminated because it was not technically feasible. See more in Section 6.4, Route Screening Results, of this alternatives memorandum.

Mining District and carry mineral ore slurry out. A pipeline alone, however, would not satisfy the project purpose and need of supporting mineral exploration and mineral development because it would not handle the heavy loads of equipment or large vehicles needed at mining sites. Purpose and Need: Does not meet purpose and need because it does not reasonably support hauling heavy mining equipment.

Pipeline/Road: This mode was proposed by the EPA during a workshop held for the Supplemental EIS, and through comment and review of the draft document. This mode is screened out due to technical feasibility of operating a slurry pipeline for the distance proposed and existing conditions, economic feasibility, and the increase in environmental impacts associated with physical disturbance to wildlife habitat, permafrost soils, and wetlands.

6.3.2 Modes Moving Forward

Modes moving forward for further consideration:

- Road
- Rail (narrow gauge and standard rail)

Road (standard road): Forwarded to second level screening because roads provide a surface transportation method that is technically feasible and can satisfy the project purpose and need, depending upon route. This mode is a proven technology for supporting mining, including in the arctic environment of the project area. The design criteria for this mode are well understood. This mode was proposed by the applicant.

Rail (standard rail): Forwarded to second level screening because rail provides a technically feasible surface transportation method that could satisfy the project purpose and need, depending upon the route. Rail was noted as being effective at hauling heavy loads for long distances in support of mining operations around the country, including Alaska. This mode is a proven technology in Alaska's northern climate.

Rail (narrow gauge): Forwarded to second level screening, with a note that narrow gauge rail rolling stock could not freely interchange with standard gauge rails on the existing Alaska Railroad. Narrow gauge rail was forwarded to second level screening, most likely as a variation on standard rail, rather than as a stand-alone alternative. It was noted that narrow gauge rail, while not as widely developed as it once was, is used in support of mining operations elsewhere and may provide advantages for reducing impacts because of its narrower footprint and generally more flexible design criteria.

6.4. Route Screening Results*

BLM's second phase of alternatives screening was to apply the screening criteria to the modes carried forward—road and rail modes—and to assess specific routes. This section describes BLM's rationale for screening out some route alternatives as not reasonable and carrying others forward for further analysis. BLM considered all available information (e.g., matrices, scoping comments, cooperating agency input, and applicant material). This section should be read in conjunction with the route screening information presented for all screened route alternatives in Attachment C of this document.

The BLM rescreened the Selawik Flats Route to reflect new information related to the reasonable foreseeability of a deep water port in Nome and reviewed the screening results of all of the other routes to determine whether or not the original analysis remains valid for the Supplemental EIS. For all other alternative routes, it was determined that the initial results of screening applied during preparation of the original EIS remain valid.

6.4.1 Alternatives Considered but Determined Not Reasonable

Alternative road and rail routes eliminated from further consideration:

- Original Brooks East Route (road; previous DOT&PF alternative)
- Kanuti Flats Route (road; previous DOT&PF alternative)
- Rail to Dalton Highway along AIDEA Proposed Route (from scoping)
- DMTS Port Route (road; previous DOT&PF alternative)
- DMTS Port Route (rail; previous DOT&PF alternative)
- Route along Kobuk River to Tidewater (road; from scoping)
- Road to Kiana Area, then Barge via Kobuk River (road and barge; from scoping)
- Cape Blossom Route (road; previous DOT&PF alternative)
- Cape Blossom Route (rail; previous DOT&PF alternative)
- Selawik Flats Route (road; previous DOT&PF alternative)
- Selawik Flats Route (rail; previous DOT&PF alternative)
- Cape Darby Route (road; previous DOT&PF alternative)
- Cape Darby Route (rail; previous DOT&PF alternative)
- Variation of Selawik/Cape Darby to access other mining resources (road; from scoping)
- Nome Route (road; a Selawik Flats variant suggested post-scoping)
- Elliott Highway Route (road; previous DOT&PF alternative)
- Parks Highway Rail Route (rail; previous DOT&PF alternative)

Original Brooks East Route

Type: Road Area: Eastern Length (miles): 220

This alternative is similar to the AIDEA Proposed Route. It preceded the current Proposed Route but was revised by AIDEA to avoid community impacts and concerns. Its screening results generally were positive. However, it was noted as not favorable to the communities of Bettles and Evansville, which it passes through or near. Community objections were a substantial reason AIDEA refined the route to avoid the communities. The alternative connects to the Dalton Highway, some 15 miles south of the AIDEA Proposed Route, but no substantive functional difference between these connection points would be anticipated. The revised connection point was proposed by the applicant. Between the refinements already made and the substantive duplication, this route is not being carried forward for detailed analysis in the Supplemental EIS.

- Duplication: This route is duplicative of the applicant's proposed route, but is less favorable (i.e., has unacceptable community impact compared to the applicant's proposed route) and therefore is not carried forward.

Kanuti Flats Route

Type: Road Area: Eastern Length (miles): 240

This alternative was an early route examined by DOT&PF that passes near or through Evansville and Bettles and south of Gates of the Arctic National Preserve before bending north to access the Ambler

Mining District. Community objections were a substantial reason AIDEA refined its routes to avoid the communities and did not continue to pursue the Kanuti Flats Route. BLM found it substantially similar in concept to the AIDEA Proposed Route and AIDEA Alternative Route, and did not find a compelling need for an alternative that would avoid the Preserve given that Congress explicitly wrote into law a provision for access through the Preserve. Of the environmental factors measured during screening, this route generally had higher caribou habitat impacts, crossed more anadromous fish streams, and impacted more riparian acreage compared with other alternatives.

- Duplication: This route is duplicative to the applicant's proposed route but is less favorable in regard to geotechnical concerns, difficult river crossings, access to construction materials, anadromous fish stream crossings, and construction cost. Therefore, this route is not being carried forward for detailed analysis.

Rail to Dalton Highway

Type: Rail Area: Eastern Length (miles): approximately 211

This alternative follows the same general route as the AIDEA Proposed Route but for a railroad instead of a road. During screening discussions with cooperating agencies, concerns were noted about construction costs (more than \$1 billion) and impracticality of transferring ore from rail to truck at the Dalton Highway, then potentially transferring it back to rail in Fairbanks for shipment south. DOT&PF did not analyze this alternative in its 2011 effort. The route had a cursory engineering overview for fatal flaws as a rail route, because railroads require lower maximum grades than roads, and then it was screened.

The concept is not practical due to substantial handling inefficiencies (and therefore increased operating costs). Due to the steepness of the terrain where the mines would be located it is not anticipated that rail spurs could be feasibly connected directly to the mines because of grade limitations. This implies ore and equipment would need to be loaded/unloaded at the rail line's western terminus and trucked to and from the mines themselves and necessitating an intermodal transfer facility at the rail line's west end. A similar intermodal facility would be needed at the east end (Dalton Highway), to again transfer ore/equipment to/from highway-legal trucks for transportation over the Dalton Highway to Fairbanks. According to testimony before the Alaska Legislature, Trilogy Metals intends to load containerized ore onto the Alaska Railroad near Fairbanks (necessitating yet another transfer point and handling facility). The transfer of modes at each end of the rail line and yet again in Fairbanks is inefficient and impractical due to the double, or triple handling of each truckload or container. Compared to loading trucks at the mine that can then drive onto the road system all the way to Fairbanks for 1 transfer to the Alaska Railroad (or trucked directly to a port), this requirement for multiple transfers would be inefficient. The time, infrastructure, and labor costs for the extra transfers would be high and not practical.

Also, having an "isolated" rail system not connected to a port or railroad was determined not to be practical. This isolated rail system would not allow an efficient or practical way to bring in locomotives, railcars, or other large equipment. During initial construction the locomotives would likely have to be disassembled and then reassembled at the site. This is very nearly cost prohibitive. Not having a connection to the existing railroad infrastructure would prohibit sending out any on rail equipment to existing Alaska Railroad maintenance shops. Thus all maintenance facilities would have to be self-contained on site.

There is also the added concern that the disassembled rail equipment may still be too heavy for the bridges on the Dalton Highway. Locomotives of the type anticipated to be needed for an alternative such as this weigh approximately 430,000 total pounds (over 215 tons) are over 10 feet wide, 16 feet high, and 76 feet long.

This alternative would be expected to follow the same general alignment as the AIDEA Proposed Route (with considerations regarding where grades need to be shallower for rail) and is therefore duplicative of that route. Its primary benefit was thought to be the somewhat less likelihood of people using street vehicles, all-terrain vehicles, or snowmobiles to access the land along the route, either legally or illegally. However, the rail concept includes a single lane maintenance road alongside the tracks, so the possibility of public access would remain. There is likely little practical difference in impacts between the road and rail modes on this alignment.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Economic Feasibility (in 2018 dollars): Cost would be \$1.05 billion, which would be nearly 3 times more (approx. \$700 million) than the applicant's proposal (\$356 million).
- Practicality: Not practical. Multiple handling requirements and mode transfers, inefficiency, and technical problems moving to, and maintaining rail equipment at, this remote, "isolated" rail line make this alternative impractical using common sense.
- Duplication: This alternative is expected to follow the same general alignment as the AIDEA Proposed Route with very little meaningful difference in impact and no clear benefit to outweigh the costs and practicality concerns.

DMTS Port Route – Road

Type: Road Area: Western Length (miles): 260

This alternative would access the existing DMTS port, which primarily serves mining at the Red Dog Mine. However, a 2012 DOT&PF assessment of needs at the DMTS port resulted in an estimated additional cost of \$215 million to \$260 million for additions to the port facility to enable adequate support for the Ambler Mining District activity. Screening indicated intermediate values for geotechnical concerns (poor soils and relatively poor access to construction material, such as gravel); a higher number of difficult river crossings compared to other alternatives; and high construction costs (nearly \$800 million, which is more than double the applicant's proposed route cost even before adding the cost to build new port facilities). There may be limited or no port use in winter if the Chukchi Sea continues to freeze over and there is a lack of investment in icebreakers. Both the future sea ice conditions and the prospect of icebreaker use to maintain access to ports is speculative. The route would cross substantial caribou habitat (8,030 acres), but these values are still intermediate relative to other alternatives. Crossings of anadromous fish streams would be relatively high at 13 compared with other alternatives.

Considering all the criteria, the BLM initially retained this alternative for further evaluation. Additional information was collected and reviewed, particularly with regard to capacity at the DMTS port. A 2014 feasibility study prepared for a separate proposed mine development in the vicinity assessed capacity at the DMTS port site and concluded that additional capital expenditures would be required to accommodate additional mine development (HDR, Inc. 2014).

While the DMTS port site exists and functions for mineral export currently, in addition to being owned by the applicant, existing capacity concerns exist; while space appears to be available adjacent to the existing DMTS site, the additional construction to provide sufficient capacity required is so extensive BLM determined it would be akin to building a new port. Furthermore, the existing port provides only seasonal access with open water roughly 3 to 4 months out of the year.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- **Purpose and Need – Logical Termini and Practicality:** The existing port with its current infrastructure is at its practical capacity. Therefore, BLM determined the route does not have a logical terminus because it would require the construction of a new port.
- **Economic Feasibility (in 2018 dollars):** The total project would be between \$1.02 billion and \$1.07 billion, which would include both the road construction and port construction. The road cost would be almost \$800 million, which is more than double the applicant's proposal (approx. \$356 million).
- **Environmental Factors:** compared with other alternatives, this alternative has relatively high impacts to caribou habitat, anadromous fish streams (13), National Hydrography Dataset (NHD) stream crossings (269), and NHD riparian habitat (151 acres), without substantive environmental benefits. There is a lack of substantive environmental benefits in other metrics compared to other alternatives, which might otherwise warrant this alternative's continuing analysis.

DMTS Port Route – Rail

Type: Rail Area: Western Length (miles): 260

This alternative would access the existing DMTS port, which primarily serves mining at the Red Dog Mine. It would follow the same alignment as the road but would be a railroad. Screening indicated intermediate values for geotechnical concerns (poor soils and relatively poor access to construction material, such as gravel), difficult river crossings, and high construction costs. The values indicated were the same as indicated above for the road, but the construction costs were much higher, at approximately \$1.46 billion for the rail, in addition to the cost to build new port facilities which would be an additional \$232 million to \$280 million (in 2018 dollars). There may be limited or no port use in winter if the Chukchi Sea continues to freeze over and there is a lack of investment in icebreakers. Both the future sea ice conditions and the prospect of icebreaker use to maintain access to ports is speculative. The route would cross substantial caribou habitat (8,030 acres). Crossings of anadromous fish streams would be relatively high at 13. Considering all the criteria, BLM initially retained this alternative for further evaluation during the screening process. Usability of the port is a key consideration of this alternative. Additional information was collected and reviewed to help determine if use of the DMTS port meets the purpose and need.

This alternative is not being carried forward for detailed analysis. The same key factors applicable to the road version of this route apply to the rail route. Additionally, the project would cost between \$1.61 billion and \$1.66 billion (which includes both rail and port development).

Route along the Kobuk River to Tidewater

Type: Road Area: Western Length (miles): 150 (no route to officially measure)

This concept was suggested during scoping, but the concept was vague and had insufficient detail to delineate a specific route. DOT&PF already engineered routes in this general corridor and found a technically feasible route along the Kobuk River as far as Kiana (see the DMTS route). Moving the route closer to the Kobuk River would only serve to increase impacts and decrease the route's technical feasibility. For example, it would increase floodplain impacts, and would be worse for subsistence values (the Kobuk River was identified during scoping as a critical river for subsistence fishing) compared to the DMTS route. Moreover, a route closer to the river would cross more challenging soils from an engineering perspective and would be farther from material sites, increasing costs and decreasing its technical feasibility. Screening indicated poor results on most criteria. Critical issues include lack of any existing port near the mouth of the Kobuk River, which means it would not adequately satisfy the project purpose and need. DOT&PF explored various port development options (although not at the mouth of the

Kobuk River) and found the costs on the west coast of Alaska to be high.⁸ Because the alternative would not connect to an existing port and fared poorly on other criteria, it was deemed unnecessary to delineate a precise route and calculate other metrics. This route was determined to be duplicative of the DMTS route on its eastern half (but was not as good as the DMTS route on several metrics, when considering the full route) and would not connect to an existing port on its western terminus. Primarily because of the purpose and need issues, and without sufficient other redeeming qualities, this alternative is not being carried forward for detailed analysis in the Supplemental EIS.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Purpose and Need – Logical Termini: Port does not exist at the mouth of the Kobuk River and therefore this alternative does not satisfy the purpose and need.
- Duplication: Similar to the DMTS route but would have worse soils and greater floodplain impacts compared to other alternatives.
- Not practical: Requires speculation that mining companies would find it practical given the long water-borne distance and shallow drafts in a short hauling season.

Cape Blossom Route – Road

Type: Road Area: Western (Kotzebue) Length (miles): 250

This alternative would access the coast at Cape Blossom, just south of Kotzebue on Kotzebue Sound. The screening criteria showed poor results, with relatively many large river crossings and poor access to material sites (average distance would be 20 miles). No port exists at Cape Blossom today. A 2012 DOT&PF assessment of port needs at Cape Blossom resulted in an estimated additional cost of \$255 million for a port facility there. A small port exists nearby at Kotzebue, and an 11-mile road is under construction between Kotzebue and Cape Blossom (as of 2018). The existing port at Kotzebue is a small, privately owned facility where ore export would be infeasible given the port's location in town. The reason is due to the lack of existing facilities to accommodate seasonal storage of ore and a lack of space on the land side of the port to construct such facilities. In addition, the requirement to transport ore through town by truck or possibly conveyer would cause community impacts. In fact, the community's desire to build a road to Cape Blossom is to provide access to a port location that's deeper than the shallow port conditions in Kotzebue.

The lack of an existing port at Cape Blossom, the small and shallow port at Kotzebue without shore-side capacity, and the construction feasibility and cost issues cumulatively weighed against this alternative. This alternative is not being carried forward for detailed analysis.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Purpose and Need – Logical Termini: Port does not exist at Cape Blossom and therefore this alternative does not satisfy the purpose and need. Adequate port facilities do not exist at Kotzebue; the additional construction required in Kotzebue is so extensive BLM determined it would be akin to building a new port. Therefore, at either Cape Blossom or Kotzebue, this alternative does not satisfy the purpose and need.

⁸ Port construction cost estimates range from \$215M to \$260M (in 2011 dollars) and are included in Ambler Mining District Access Draft Conceptual Port Cost Evaluation Report (February 2012).

- Economic Feasibility (in 2018 dollars): The total project cost would be approximately \$1.22 billion, which includes both the road and port construction. The road cost would be \$947 million, which is 2.5 times more than the applicant's proposed route (\$356 million). The additional cost of port development (approx. \$275 million) pushes this alternative over \$1 billion.
- Environmental Factor – Caribou Habitat: Would impact 8,290 acres, which would be 2,429 acres (41 percent or 1.4 times) more than the applicant's proposed route (5,861 acres). This alternative impacts an intermediate level of NHD stream crossings (260) and NHD riparian acreage (158 acres). There is a lack of substantive environmental benefits in other metrics compared to other alternatives, which might otherwise warrant this alternative's continuing analysis.
- Practicality: The alternative requires speculation that an adequate port would be built and therefore this alternative does not have a logical terminus.

Cape Blossom Route – Rail

Type: Rail Area: Western (Kotzebue) Length (miles): 250

This alternative would access the coast at Cape Blossom, just south of Kotzebue on Kotzebue Sound. No port exists there today, but a small port exists nearby at Kotzebue and an 11-mile road is under construction between Kotzebue and Cape Blossom. The screening criteria for this alternative showed poor results, with many relatively large river crossings and low access to material sites (average distance was estimated at 20 miles). The construction cost was among the highest of the alternatives. A 2012 DOT&PF assessment of port needs at Cape Blossom resulted in an estimated additional cost of \$255 million for a port facility. This alternative requires speculation that a suitable port would be constructed. The lack of an existing port at Cape Blossom, the relatively small and shallow port at Kotzebue (as described above for the Cape Blossom road route), and the construction and costs issues cumulatively weighed against this alternative.

The alternative is not being carried forward for detailed analysis. The same key factors applicable to the road version of this route apply to the rail route. The total project would be \$1.74 billion (in 2018 dollars), nearly 5 times more than the applicant's proposed route (approx. \$356 million). Rail and port costs would be approximately \$1.47 billion and \$275 million, respectively.

Selawik Flats Route – Road

Type: Rail Area: Western (Nome) Length (miles): 250

The Selawik Flats Route would connect to the existing Nome-Council Road and, via that road, to a reasonably foreseeable deep water port at Nome. The Nome-Council Road is an approximately 73-mile-long seasonal road. It is likely that the road would require upgrades to make it operable for regular year-round mining support traffic, and that would be an additional cost. A shallow port exists at Nome today which would not have capacity to support a substantial export of ore, nor does not have immediately adjacent space available to stockpile ore seasonally. However, a deep water port has been proposed at Nome, and its construction is reasonably foreseeable, with an estimated completion date of 2030. Once constructed, it is assumed that the deep water port would support year-round operations with the use of ice breakers.

In general, the alternative showed middle of the range values comparatively on the screening criteria, with limited material sites, multiple large bridges, and intermediate geotechnical rating, all of which is reflected in relatively high costs—more than \$1 billion. Along with the Cape Darby routes, it appears the Selawik Flats Route would have among some of the greatest impacts of all alternatives to the natural

environment in all categories. The preponderance of factors weighing against it means this alternative is not being carried forward for detailed analysis.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Economic Feasibility (in 2018 dollars): The road cost would be \$1.06 billion, which is nearly 3 times more than the applicant's proposed route (\$356 million).
- Environmental Factor – Caribou Habitat: Would impact 10,934 acres, which is 5,073 acres (87 percent or 1.9 times) more than the applicant's proposed route (5,861 acres). This alternative has one of the highest amounts of impacts to caribou habitat of any of the routes, along with the Cape Darby and Nome routes. A large portion of the route is located on lands with the highest percentage of fall migration use by the Western Arctic Caribou Herd (WAH).
- Environmental Factors: This alternative crosses four major anadromous rivers—the Kobuk, Selawik, Buckland, and Koyuk and would involve the greatest number of known anadromous fish stream crossings of any of the alternatives (18 streams). The route could indirectly result in impacts to marine mammals, including threatened and endangered species. There is a lack of substantive environmental benefits in other metrics compared to other alternatives, which might otherwise warrant this alternative's continuing analysis.
- Practicality: The alternative requires speculative assumptions regarding the reasonably foreseeable Port of Nome development; specifically, regarding the port's estimated completion date (currently estimated to be complete in 2030), storage capacity (TBD), and whether year-round access would be possible (i.e., with an ice breaker). In addition, this alternative assumes that Nome-Council Road may need to be improved.

Selawik Flats Route – Rail

Type: Rail Area: Western (Nome) Length (miles): 250

The Selawik Flats Route for rail has all the same issues as discussed above for the road. When DOT&PF examined the Selawik Flats route, DOT&PF gave the road and rail routes the same length, ending the routes at Council. A rail route, even more than a road route, would require an extension of rail construction to Nome. Following the existing Nome-Council Road route, this would be an additional extension of approximately 73 miles, or approximately 22 percent. It is not clear that the same route could be followed through the hilly terrain between Council and the coast, because of grade requirements, and it is not clear that the route along the coast would be sufficiently protected from sea ice. Regardless, this would represent substantial added cost, on top of an already expensive construction cost of \$1.72 billion.

This alternative is not being carried forward for detailed analysis. The same key factors applicable to the road version of this route apply to the rail route. Additionally, the project would cost at least \$1.72 billion (in 2018 dollars), or more than 4.8 times the applicant's proposed route (\$356 million).

Cape Darby Route – Road

Type: Road Area: Western (Norton Sound) Length (miles): 340

This alternative would share a long portion of its alignment with the Selawik Flats Route across the base of the Seward Peninsula and would access the coast at Cape Darby on Norton Sound. BLM determined this alternative would not satisfy the purpose and need because it would not connect to an existing port of any kind. Cape Darby has been a proposed deep water port site, but there is no indication a port actually would be built there. Without a reasonably foreseeable port, the alternative was considered to have no

logical terminus at its western end. Moreover, a draft 2012 DOT&PF assessment of port needs at Cape Darby resulted in an estimated additional cost of \$255 million for a port facility. This alternative requires speculation that a suitable port would be constructed. In addition, the Cape Darby Route, along with the Selawik Flats Route, would have among the greatest area of impact to caribou habitat and anadromous fish streams as well as high costs for construction. Of the environmental factors measured during screening, this route had higher caribou habitat impacts and crossed more anadromous fish streams than other alternatives. Therefore, this alternative is not being carried forward for detailed analysis.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Purpose and Need – Logical Termini: A port does not exist at Cape Darby and therefore this alternative does not satisfy the purpose and need.
- Economic Feasibility (in 2018 dollars): Total project cost would be \$1.32 billion, which includes \$1.06 billion for the road and \$275 million for port construction. Total project cost of this alternative is more than 3.5 times more the applicant’s proposed route, which would cost \$356 million.
- Environmental Factors – Caribou Habitat: Would impact 11,203 acres, which would be 5,342 acres (91 percent or 1.9 times) more than the applicant’s proposed route (5,861 acres). Like the Selawik Flats (road) Route and Nome Route, this is one of the alternatives that impacts the greatest amount of caribou habitat compared to all other alternatives. There is a lack of substantive environmental benefits in other metrics compared to other alternatives, which might otherwise warrant this alternative’s continuing analysis.
- Practicality: The alternative requires speculation that a port would be built and therefore this alternative does not have a logical terminus.

Cape Darby Route – Rail

Type: Rail Area: Western (Norton Sound) Length (miles): 340

This alternative would be identical to the Cape Darby road route, described above, but would be built as a railroad. The BLM decided it was not a reasonable alternative to carry forward for further analysis for the same reasons—the lack of a logical terminus at the western end means the alternative would not satisfy the project purpose and need, and it would have very high construction costs and environmental impacts compared to other alternatives. Of the environmental factors measured during screening, this route had higher caribou habitat impacts and crossed more anadromous fish streams than other alternatives.

This alternative is not being carried forward for detailed analysis. The same key factors applicable to the road version of this route apply to the rail route. Additionally, the project would cost \$2.0 billion (in 2018 dollars), which includes \$1.06 billion for rail construction and \$275 million for the additional cost of port construction.

Variations on Selawik Flats/Cape Darby Route – Road

Type: Road Area: Western Length (miles): 250–340, based on Cape Darby/Selawik

This alternative route came from scoping, but its location was not specified during scoping. The concept was vague and had insufficient detail to delineate a specific route. DOT&PF already engineered routes in this general corridor and found technically feasible routes in the Selawik Flats and Cape Darby routes. The BLM received this concept during scoping, which appeared to be suggesting there might be slight routing variations on the DOT&PF studied routes that would provide access to other mining districts,

thereby improving road usage and potential economic return. Examination of other mining districts along the general routes of the Selawik Flats and Cape Darby routes indicated the DOT&PF routing already provided adequate access to the mining districts in the vicinity (side road connections would be needed, but these connections are not any different than the connections that would be needed at the Amber Mining District). BLM's assessment was that there would be no need for any substantial route modification to provide access to these other districts. Therefore, the suggested variations were considered duplicative of the DOT&PF routes previously examined and additional refinement of this concept for screening would not be necessary. Moreover, the purpose and need is to provide access to the Ambler Mining District, not to provide access to these other mining areas. Based on these considerations, it was determined there was no need to carry a variation forward as a separate alternative for analysis because the suggested routing was substantially similar to the Selawik and Cape Darby routes.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Purpose and Need: An adequate port does not exist at Cape Darby and therefore variations of this alternative terminating at Cape Darby do not satisfy the purpose and need.
- Practicality – Environmental Factors: A variation on the Cape Selawik and Cape Darby routes would likely have similar environmental and cost factors, which contributed to the dismissal of those routes.
- Duplication: Further refining this concept for screening was determined not necessary as the Cape Selawik and Cape Darby routes already provide adequate access to these mining areas and were fully screened.
- Practicality: The variations of this alternative terminating at Cape Darby require speculation that a port would be built at Cape Darby and therefore these variations do not have a logical terminus. The variations of this alternative terminating at the Port of Nome require speculative assumptions regarding the port's estimated completion date (currently estimated to be complete in 2030), storage capacity (TBD), and whether year-round access would be possible (i.e., with an ice breaker). In addition, this alternative assumes that Nome-Council Road may need to be improved.

Nome Route (a Selawik Flats variant) – Road

Type: Road Area: Western (Nome) Length (miles): 338

This alternative was added for consideration during the alternatives development and screening phase, and expands on a particular scoping comment BLM received requesting consideration of a specific variant of the Cape Darby and Selawik Flats routes going westward from the mining district. In August 2018, the BLM received electronic files depicting this 388-mile road. Like the Selawik Flats route, this alternative would connect to the existing Nome-Council Road and, via that road, to a reasonably foreseeable deep water port at Nome. The Nome-Council Road is an approximately 73-mile-long seasonal road. As with the Selawik Flats route, it is likely that the road would require upgrades to make it operable for regular year-round mining support traffic, and that would be an additional cost.

The BLM calculated the environmental metrics for this route, which impacts the greatest amount of caribou habitat compared to any other alternative (11,738 acres). While this alternative likely has not received the same level of preliminary or conceptual design as other alternatives, the route appears to go through mountainous terrain; presumably the alternative could be re-routed to avoid steep topography. However, if it is re-routed to avoid the steep terrain, it may begin to look similar to the other Cape Darby or Selawik Flats routes.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- **Economic Feasibility:** While costs were not calculated, this alternative is anticipated to be more expensive than other nearby routes (Cape Darby or Selawik Flats) due to the steeper terrain. Costs for those 2 routes were estimated as more than 1 billion dollars, plus the cost of port construction.
- **Environmental Factor – Caribou Habitat:** This alternative impacts the highest amount of caribou habitat (11,738 acres). Similar to the Selawik Flats route described above, this route would also potentially impact more major anadromous rivers and key migration routes for the WAH and could indirectly impact marine mammals.
- **Practicality:** The alternative requires speculative assumptions regarding the reasonably foreseeable Port of Nome development—specifically, regarding the port’s estimated completion date (currently estimated to be complete in 2030), storage capacity (TBD), and whether year-round access would be possible (i.e., with an ice breaker). In addition, this alternative assumes that Nome-Council Road may need to be improved.

Elliott Highway Road Route

Type: Road Area: Southern Length (miles): 370

This alternative would extend from the existing Elliott Highway westward and across the Yukon River, then northward to Gates of the Arctic National Preserve, then west and north around the “boot” of the Preserve. This is the longest road route examined, and it would require a large bridge over the Yukon River. For these reasons it was the most expensive of the road routes examined. It has generally intermediate values for environmental impacts, with intermediate levels for caribou habitat and anadromous fish stream impacts. The geotechnical ranking was quite poor, indicating challenging construction. Its ongoing operations and maintenance costs were also noted as quite high. While there was no single value that weighed heavily against this alternative, there was little to distinguish it positively.

From a common sense practicality standpoint, the route would effectively parallel the Dalton Highway for about half its length (it runs nearly north south from a point just east of the Gates of the Arctic National Preserve to the Tanana area). This north-south segment would be a duplication of an existing road, the Dalton Highway, but with unnecessary environmental impact and cost. Moreover, it also is duplicative of an alternative suggested during scoping (the Communities Route), which runs on a diagonal, and thus has a shorter constructed length (64 miles) and costs less. The Elliott Highway route would also have more caribou habitat impacts, cross more anadromous fish streams, and cross slightly more NHD streams affecting slightly more riparian habitat than the communities alternative. Thus while it is similar to the communities route, it is not as good as the communities alternative. There is also a lack of substantive environmental benefits in other metrics compared to other alternatives, which might warrant this alternative’s continuing analysis. Considering this combination of factors, BLM determined this alternative is not being carried forward for detailed analysis.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- **Economic Feasibility (in 2018 dollars):** Cost would be \$1.09 billion, which would be nearly 3 times the applicant’s proposed route (\$356 million). This is most expensive and longest of the road routes examined.

- Duplicative: Is similar to the existing and parallel Dalton Highway for approximately half its length but is not as good due to environmental impacts (e.g., caribou and anadromous stream crossings).
- Duplicative: Would be similar to the Communities Route but with 64 additional miles of construction, \$375 million more in construction costs, and greater impacts to caribou habitat, anadromous and other streams, and riparian habitat.

Road to Kiana/Barge (Kobuk River)

Type: Road Area: Western Length (miles): 149 (plus up to 110 water miles)

This alternative would extend from the Ambler Mining District westward along the DMTS route alignment as far as Kiana, and would divert (7 miles) to the Kobuk River near Kiana. Instead of using barges at the ocean to lighter loads to ocean-going vessels, this alternative would use barges starting approximately 60 miles upriver. This road route is the same as the first half of the DMTS route except for the western 7 miles near Kiana. It would have similar issues but, at half the length (149 miles of road construction), would cost less to construct and would have fewer impacts than the DMTS route. Shallow-draft river-going barges (less than 5 feet draft⁹) are used to lighter fuel and freight from Kotzebue to communities along the Kobuk River drainage (e.g., Noorvik, Kobuk and Kiana). Often the Kobuk River is too shallow even for these barges, and at these times, fuel and other freight are flown to these communities. Consequently, barging ore and supplies on this route would not be technically feasible, especially when considering additional costs due to potential delays given the short operating window. Comments from the Northwest Arctic Borough at the first Alternatives Development meeting confirmed that the Kobuk is too shallow to be a reliable barging route. The concept of dredging raised environmental concerns for the cooperating agencies (Allakaket and Northwest Arctic Borough). Because it would not support transportation of ore, supplies, and heavy equipment, it also would not satisfy the purpose and need. Considering this combination of factors, BLM determined this alternative is not being carried forward for detailed analysis.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- Purpose and Need: Would not meet purpose and need because it would not feasibly and practically be able to support mining exploration and development activities. No adequate port exists so this alternative would not have a logical terminus.
- Technical Feasibility: Not technically feasible. Barges are not reliable given the shallow water conditions in the Kobuk River. Rivers near the Ambler Mining District are too shallow for barges hauling the kinds of materials anticipated, which would require dredging.
- Practicality: Changing climate conditions require speculation that water levels will remain constant over time, introducing further technical feasibility issues and making barge modes not practical based on the necessary speculation.

Parks Highway Rail Route

Type: Rail Area: Southern Length (miles): 420–450

This alternative would connect to the existing Alaska Railroad line west of Fairbanks with the Ambler Mining District by a generally direct route (diagonally in a southwest/northeast direction from the Ambler Mining District). The route overlaps with the Elliott Highway Road Route. At the southern end, variations

⁹ Of note, much larger barges with a draft of 23 feet are used at Red Dog Mine, and would be considered a more likely type of vessel needed to support a feasible operation.

would connect with the existing railroad north and south of the Tanana River, with the southern option requiring a crossing of the Nenana, Kashwitna, Tanana, and Yukon rivers. At the northwestern end, one variation would skirt Gates of the Arctic National Preserve and one would cross the “boot” of the Preserve at approximately its narrowest point. This alternative did not perform well in the screening criteria, with lengths of 420 to 450 miles, a poor geotechnical value, and costs of \$2.14 to \$2.72 billion for construction and up to 10,000 feet of major bridge construction. Its access to construction material was good, but anadromous fish stream impacts would be among the highest of the alternatives. Of the environmental factors measured during screening, this route had similar caribou habitat impacts as other alternatives and crossed more anadromous fish streams but had some of the higher impacts to other environmental features.

A potential benefit of this alternative initially was thought to be the somewhat less likelihood of people using street vehicles, all-terrain vehicles, or snowmobiles to access the land along the route. However, the rail concept includes a single lane maintenance road alongside the tracks, so the possibility of public trespass would remain.

Key factors the BLM considered in not carrying this alternative forward for detailed analysis were the following:

- **Economic Feasibility** (in 2018 dollars): Would cost between \$2.07 and \$2.21 billion, which would be approximately 6 times more than the applicant’s proposed route (\$356 million) depending on the alignment. This is the most expensive of the proposed alternatives.
- **Technical Feasibility**: Has the worst geotechnical ranking of the routes studied by DOT&PF and the most difficult river crossings.
- **Practicality**: The rail alternative concepts may result in a redundant infrastructure (requiring both an access road and rail) and similar trespass concerns if an adjacent service road is constructed to provide access along the rail line.
- **Environmental Factors**: This route has some of the highest environmental impacts. Depending upon the route, up to 17 anadromous fish streams would be crossed; up to 343 NHD streams would be crossed, which is the highest of any alternative; and up to 183 acres of NHD riparian area would be impacted.

6.4.2 Alternatives Retained for Further Analysis*

After review and based on reconsideration of the screening analysis, the BLM determined that the following alternative road and rail routes remain reasonable and are carried forward for additional analysis in the Supplemental EIS:

- AIDEA Proposed Route (road; GAAR North)
- AIDEA Proposed Alternative Route (road; GAAR South)
- Communities Route (road; from scoping)
- Combining Phasing Option for all action alternatives

AIDEA Proposed Route (GAAR North) - Alternative A¹⁰

Type: Road Area: Eastern Length (miles): 211

¹⁰ Note that going forward, this alternative is known as “Alternative A: AIDEA Proposed Route (GAAR North) to the Dalton Highway.”

This alternative is the applicant's proposed route, and authorization for this route crossing BLM lands is the proposed action. The route runs from MP 161 of the Dalton Highway almost due west to the Ambler Mining District, crossing Gates of the Arctic National Preserve. The alternative generally was within the "acceptable" range regarding all of the screening criteria. Under Effectiveness (Purpose and Need), the total distance to an existing port was noted as 936 miles, a high number but one that AIDEA appeared to be comfortable with and the majority of which (approximately 725 miles) would be utilizing existing transportation infrastructure. Other criteria indicate a road would be constructible and less expensive than other alternatives. Considering all criteria, BLM is carrying this alternative forward for detailed analysis in the EIS.

- Purpose and Need – This route constitutes the proposed action and meets the purpose and need. The route has a logical terminus and provides year-round surface transportation access.
- Technical Feasibility: The route is technically feasible in terms of constructability, existing technology, access to construction materials, and having acceptable soil types and number of river crossings.
- Economic Feasibility (in 2018 dollars): Construction costs would be approximately \$356 million and operational costs would be approximately \$8-10 million per year, which are considered acceptable compared to other alternatives.
- Practicality and Environmental Factors: Does not rely on speculative assumptions or remotely foreseeable circumstances, and environmental factors are acceptable compared to other alternatives (i.e., impacts to caribou habitat (5,861 acres), anadromous fish streams (5), NHD stream crossings (181), and NHD riparian habitat (86.28 acres).
- Duplication: Route is not duplicative with other alternatives.

AIDEA Proposed Alternative Route (GAAR South) - Alternative B¹¹

Type: Road Area: Eastern Length (miles): 228

This alternative shares much of its length with the AIDEA Proposed Route and screened similarly. Its results, like the Proposed Route, were generally positive in screening. It was noted as substantially similar to other routes. However, despite similarities, it was retained at this time because it provides a distinctly different route across Gates of the Arctic National Preserve and dovetails with the alternatives the National Park Service is evaluating across the Preserve in a parallel Economic and Environmental Assessment process required under ANILCA Section 201(4)(b). Considering all criteria, BLM is carrying this alternative forward for detailed analysis in the EIS.

- Purpose and Need – Route meets the purpose and need. The route has a logical terminus and provides year-round surface transportation access.
- Technical Feasibility: The route is technically feasible in terms of constructability, existing technology, access to construction materials, and having acceptable soil types and number of river crossings.
- Economic Feasibility (in 2018 dollars): Construction costs are unavailable but are assumed to be acceptable based on similarity to other AIDEA proposed route (Alternative A). Operational costs would be approximately \$9-11 million per year, which are considered acceptable compared to other alternatives.

¹¹ Note that going forward, this alternative is known as "Alternative B: AIDEA Alternative Route (GAAR South) to the Dalton Highway."

- Practicality and Environmental Factors: Does not rely on speculative assumptions or remotely foreseeable circumstances, and environmental factors are acceptable compared to other alternatives (i.e., impacts to caribou habitat (6,382 acres), anadromous fish streams (6), NHD stream crossings (190), and NHD riparian habitat (95.36 acres).
- Duplication: Substantially similar with other alternatives, except for its distinctly different route across Gates of the Arctic National Preserve.

Communities Route (Tanana-Hughes-Hogatza-Kobuk) - Alternative C¹²

Type: Road Area: Southern Length (miles): 306

This alternative would extend from the Elliott Highway across the Yukon River on the same route as the Elliott Highway alternative, but would head northwest toward Hughes, Hogatza, and Kobuk and enter the Ambler Mining District from the south. This alternative was developed based on a scoping comment that named the communities but did not otherwise specify a route. The route was developed at a cursory level based on an overview of aerial photographs and maps, including generalized topography and land status. The route has had no engineering beyond determination that an alignment substantially similar to that shown in this document likely could be constructed in the corridor. However, it was noted that if this alternative advanced through the screening process, additional engineering would be necessary.

The Communities Route is longer than most road routes, at 306 miles. Extrapolating from similar routes, it appears it would have reasonable access to construction materials but likely also would cross geotechnically poor soils and would have multiple large and challenging river crossings, including the Yukon River. Its southern route would cross relatively little caribou habitat. The length of the road and some of the construction challenges suggest an intermediate construction cost of approximately \$775 million, plus the cost of a crossing of the Yukon River (approx. \$153 million) (in 2018 dollars). This route would be shorter and less costly than the Elliott Highway route. In addition, public comments during scoping meetings in Shungnak, Kobuk, and Hughes showed some public support for the road and potential benefits to communities that could be derived from it.

In considering all criteria, including meeting the purpose and need and environmental factors, BLM is carrying this alternative forward for detailed analysis. This alternative would have logical termini – by connecting into the road and rail network it provides year-round access to existing ports. Its caribou habitat impacts (5,126 acres) and anadromous stream crossings (7) are among the lowest compared to the other alternatives evaluated (while its overall stream crossings and riparian acreage are among the highest). This alternative completes a range of reasonable alternatives in that it connects to the Dalton Highway considerably farther south of the proposed alternative (i.e., it spans a full range of geography) and will provide a comparison against the impacts of AIDEA’s proposed route.

This alternative would have similarities to the proposed route but would start north of the Yukon River and traverse west through the Ray Mountains and then head generally northwest toward Hughes, Hogatza, and Kobuk and enter the Ambler Mining District from the south. This alternative was developed based on scoping comments that named several communities but did not otherwise specify a route.

Alternative C is longer than most road routes, at 332 miles. It appears it would have reasonable access to construction materials but likely also would cross geotechnically poor soils and would have multiple large and challenging river crossings. Its southern route would cross relatively little caribou habitat. The length of the road and some of the construction challenges suggest an intermediate construction cost of approximately \$775 million (in 2018 dollars). Public comments during scoping meetings in Shungnak,

¹² Note that going forward, this alternative is known as “Alternative C: Diagonal Route to the Elliott Highway.”

Kobuk, and Hughes showed some public support for the road and potential benefits to communities that could be derived from it.

In considering all criteria, including meeting the purpose and need and environmental factors, BLM is carrying this alternative forward for detailed analysis. This alternative would have logical termini – by connecting into the road and rail network it provides year-round access to existing ports. Its riparian acreage is among the lowest of the alternatives (76) evaluated, while caribou habitat impacts (7,889 acres) and anadromous stream crossings (10) are intermediate among the alternatives evaluated. Overall stream crossings are among the highest compared to the other alternatives evaluated. For a discussion of the environmental data used see footnote 4. Inclusion of this this alternative in the Supplemental EIS ensures that a full range of reasonable alternatives will be evaluated. This alternative spans a wide-ranging geography in that it connects to the Dalton Highway considerably farther south of AIDEA’s proposed alternatives and would provide a comparison against the impacts of AIDEA’s proposed routes, including disclosing the impacts of an alternative that avoids crossing any Conservation System Units. Moreover, this route would traverse a different physical and ecological environment with a variety of ecotypes; thereby providing a comparison against impacts on the southern foothills of the Brooks Range under alternatives A and B.

- Purpose and Need – Route meets the purpose and need. The route has a logical terminus and provides year-round surface transportation access.
- Technical Feasibility: The route is technically feasible in terms of constructability, existing technology, access to construction materials, and having an acceptable number of river crossings.
- Economic Feasibility (in 2018 dollars): Construction and operation costs would be approximately \$775 million and \$13-16 million per year, respectively, which are considered less favorable than other alternatives.
- Practicality and Environmental Factors: Does not rely on speculative assumptions or remotely foreseeable circumstances. Riparian impacts (76 acres) are the lowest of any alternative and impacts to caribou habitat (7,889 acres) and anadromous fish streams (10) are intermediate among the alternatives evaluated.
- Duplication: Route is not duplicative with other alternatives. Spans a wide-ranging geography and different type of environment compared to AIDEA’s proposed routes.

In addition to these three alternative routes retained for detailed analysis described above, the BLM also determined that the following phasing alternative option, which was identified from new information and cooperating agency input (Section 5.4, Cooperating Agency Input on the Potential Range of Alternatives, of this alternatives memorandum), is reasonable and is retained for detailed analysis under each of the action alternatives.

- **Combining Phasing Option for All Action Alternatives:** The BLM developed this option based on public comments, new information and cooperating agency input. This option would eliminate Phase 1 and would build the entire road to Phase 2 standards. This option was developed to address impacts on permafrost, water quality, and fish and to reduce noise and disturbance impacts from staging and operating construction equipment for two separate phases.

Under this option, the first road constructed would be 4 feet wider than Phase 1 as described under the action alternatives. Additionally, it would have a thicker road embankment that would provide more insulation to mitigate potential impacts to permafrost, water quality, and fish as compared to the roadbed associated with Phase 1 of the action alternatives. Much of the

infrastructure required for Phase 2 standards of construction is the same as Phase 1 so infrastructure requirements for culverts and bridges for this option would be the same as the action alternatives.

This option of building the road to Phase 2 standards from the start is consistent with special condition number 13 of the USACE's CWA Section 404 permit for the project, which specifies, "[t]he permittee shall construct the road to Phase II standard embankment depths in areas with thaw sensitive permafrost soils and in emergent wetlands, without first constructing the pioneer road." The difference between the USACE's special condition and this proposed option is that building to Phase 2 road standards would apply to 100 percent of the route rather than the approximately 60 percent of the route that is located in areas with thaw-sensitive permafrost soils or emergent wetlands.

- It is estimated that construction of the route to Phase 2 requirements would require a single mobilization of construction equipment and construction time of approximately 2 to 3 years (compared to 3 – 4 years for separate construction of Phase 1 and Phase 2 roads).

7. Conclusion and Next Steps

7.1. Screening Results Summary

BLM conducted a 2-phase screening based on the criteria presented in Section 4, Screening Criteria, of this alternatives memorandum: first for transportation modes, independent of routes or locations of facilities; and second for specific routes and locations based on the modes carried forward for additional screening. The criteria were applied to the range of alternatives described in Section 5, Alternatives Considered, of this alternatives memorandum. BLM considered all available information (e.g., the matrices, scoping comments, cooperating agency input, and applicant material) during screening. The analysis is presented in Section 6, Alternatives Screening, of this alternatives memorandum, and is detailed in the matrices in Attachment B, Modes Screening Data, and Attachment C, Routes Screening Data, of this document. The results are summarized below.

Modes eliminated from further consideration:

- Seasonal ice road
- Elevated rail
- Standard aircraft
- Dirigible
- Barge
- Pipeline

Modes moving forward for further screening:

- Road
- Rail (includes narrow gauge and standard rail)

Alternative road and rail routes eliminated from further consideration based on route-specific screening:

- Original Brooks East Route (road; previous DOT&PF alternative)

- Kanuti Flats Route (road; previous DOT&PF alternative)
- Rail to Dalton Highway along AIDEA Proposed Route (from scoping)
- DMTS Port Route (road; previous DOT&PF alternative)
- DMTS Port Route (rail; previous DOT&PF alternative)
- Road to Kiana/Barge on Kobuk River (road; from scoping)
- Route along Kobuk River to Tidewater (road; from scoping)
- Cape Blossom Route (road; previous DOT&PF alternative)
- Cape Blossom Route (rail; previous DOT&PF alternative)
- Selawik Flats Route (road; previous DOT&PF alternative)
- Selawik Flats Route (rail; previous DOT&PF alternative)
- Cape Darby Route (road; previous DOT&PF alternative)
- Cape Darby Route (rail; previous DOT&PF alternative)
- Variation of Selawik/Cape Darby to access other mining resources (road; from scoping)
- Elliott Highway Route (road; previous DOT&PF alternative)
- Parks Highway Rail Route (rail; previous DOT&PF alternative)

Alternative road routes recommended for being carried forward for additional analysis¹³ based on route-specific screening:

- AIDEA Proposed Route (road; GAAR North)
- AIDEA Alternative Route (road; GAAR South)
- Communities Route (road; from scoping)

Conceptual alternatives being carried forward for additional analysis:

- Combined Phase 1 and 2 construction (construction of the road to Phase 2 standards)

Moving forward, these 3 alternatives will be known as, respectively:

- Alternative A: AIDEA Proposed Route (GAAR North) to the Dalton Highway
- Alternative B: AIDEA Alternative Route (GAAR South) to the Dalton Highway
- Alternative C: Diagonal Route to the Elliott Highway

These alternatives will be analyzed, along with a No Action alternative, in the Supplemental EIS.

Figure 5 illustrates the alternatives being carried forward for detailed analysis on a single map.

¹³ Note that while both road and rail modes moved forward from the first level screening, no specific rail routes moved forward for further analysis following the second level screening of individual specific routes.

7.2. Next Steps*

BLM delivered a draft of this document to cooperating agencies for review and comment in June 2018 and May 2023. Comments received were addressed, and this document was revised as appropriate based on that cooperating agency input.

Because the area of inquiry is geographically vast and the alignments long, the level of information currently known for each alternative is still limited. The BLM expects to continue gathering data and refining alternatives to ensure they are assessed based on equal data. It is considered likely that further understanding of construction costs, phasing of construction, the needs of the entire transportation system to support ore transport and transfer between transportation modes, and environmental impacts will be developed and could lead to further refinement and screening of alternatives.

A reconnaissance-level engineering effort for the Alternative C Diagonal Route to the Elliott Highway is needed to adequately compare the alternatives. Ground-proofing of assumptions, additional field studies, and other engineering evaluation may be required to provide adequate data to bring this alternative up to a level adequate for NEPA analysis. At that time further consideration of minimizing and avoiding sensitive resources should be undertaken (e.g., determining if it is feasible to avoid the Koyukuk National Wildlife Refuge).

Assuming the applicant continues to fund the effort, the alternatives will be further evaluated in a Draft Supplemental EIS, in which the purpose and need for the action will be explained in greater detail; the alternatives will be refined, mapped, and explained in greater detail; the affected environment will be described, including the physical, natural, and social/economic elements of the human environment; and all environmental impacts will be disclosed and analyzed. The public will have an opportunity to review the Draft Supplemental EIS and comment on it in writing and in formal public meetings before BLM issues a Final Supplemental EIS and a Record of Decision. A specific alternative will not be authorized until the Record of Decision is signed.

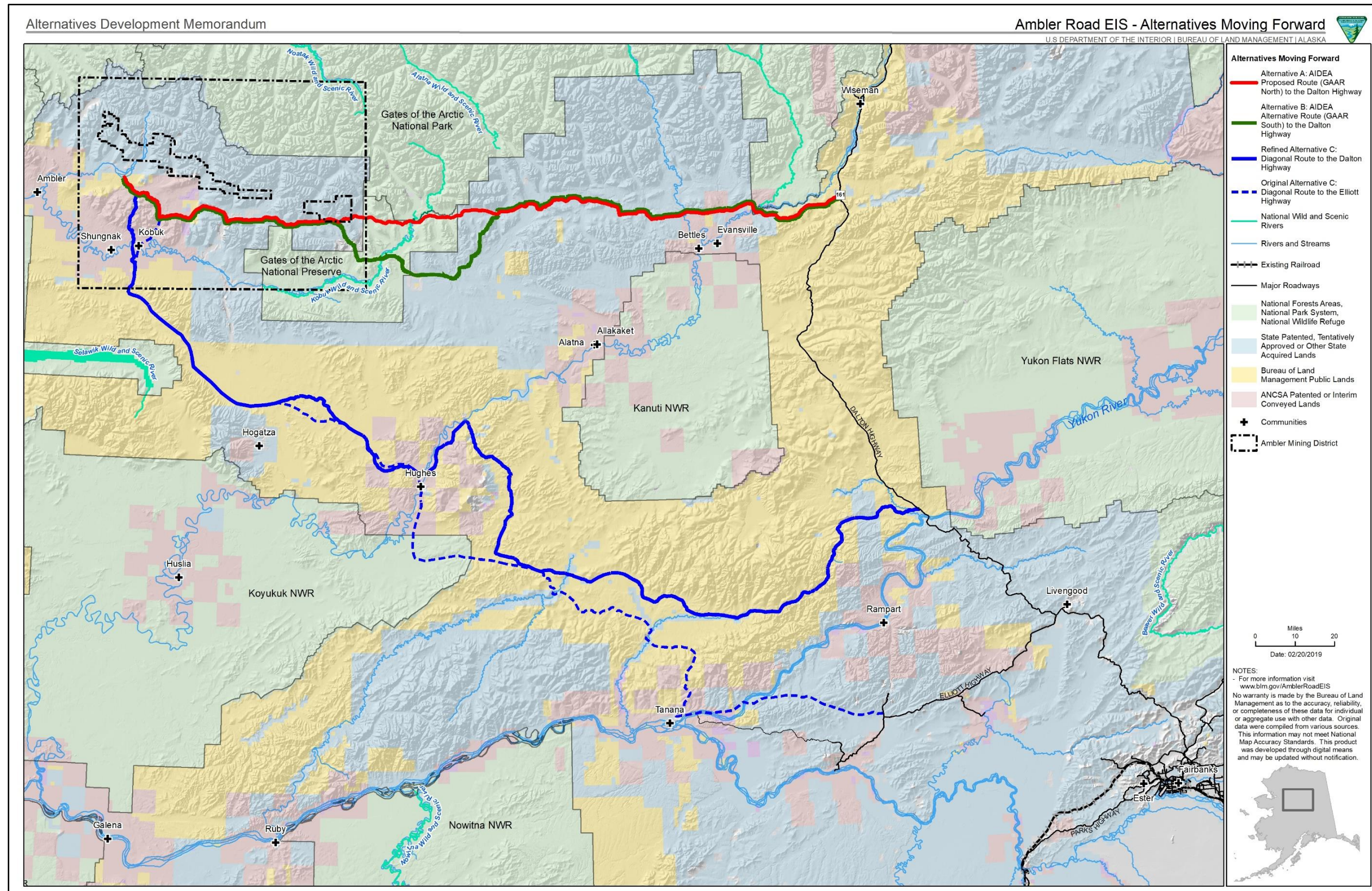


Figure 5. Alternatives carried forward for additional analysis

Source: Map prepared by HDR based on the screening results in this document.

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Attachment A. Scoping Comments on Alternatives

Note: This entire Attachment is specific to the Supplemental EIS process only. Therefore, none of the text has been highlighted to indicate new or substantially revised text.

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The following table includes approximately 98 substantive comments from the 2022 Supplemental EIS scoping period that were coded as relating to alternatives. Comments were extracted directly from the text of the public and agencies' submitted comment letters and have not been edited or corrected.

Letter Number	Comment Number	Scoping Comment
3	3	BLM should analyze a railway alternative. This would be much more energy efficient and perhaps cause less environmental damage. The trains might be electric and powered by clean alternative energy.
37	4	If this road is ever built, a 5 mile, motor-free corridor must be implemented as along the Dalton.
38	7	I recommend that potential access to tidewater to the west be added to the scope of this SEIS.
38	8	My preference is for the transport corridor for resource extraction to flow west to tidewater, not east to the Dalton Highway.
38	9	It appears, however, that the alternatives within a similar distance to the Chukchi Sea as the proposed alternatives are to the Dalton Highway have been eliminated in the DEIS screening process. It concerns me that the alternative considered to use the DMTS Port was eliminated
38	11	It is my opinion that estimates for the Action Alternatives in the FEIS are on the low range and estimates for the DMTS road are in the very high range, potentially due to the preponderance of known geotechnical information for Action Alternatives A and B.
70	2	The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.
70	4	AIDEA has not provided adequate design information about the road beyond developing a 1-lane pioneer road that will eventually become a 2-lane gravel road. With so little information about its design, BLM cannot approve the road without further broad review of the design, the construction and maintenance process, and their cumulative impacts.
71	2	BLM states that: "The proposed road would not be designed or open for public access and would be open only to industrial traffic to support expanded exploration, mine development, and mine operations at mineral prospects throughout the District. The proposed project is named the Ambler Mining District Industrial Access Project." The EIS must address how this will be accomplished. As noted, "The start of the road would be on BLM-managed public lands within the Dalton Highway Utility Corridor. The road would then extend across State-owned lands, Gates of the Arctic National Preserve, lands privately owned by Alaska Native corporations, and isolated BLM-managed parcels." So, who is responsible assuring that there is no trespassing on this road and how will they accomplish it? BLM isn't likely to take the responsibility on BLM-managed public lands; the State doesn't have the resources to do it on State land; it is unlikely that NPS has the resources to do it through the Preserve; and, I cannot speak to the Native corporations' willingness to take it on. This is problematic, and must be addressed before the project is allowed to proceed.
71	4	Can you really believe that you can control access to this road from local subsistence use? This is a huge, remote area, and resilient Alaskans are surely going to use it for access to hunting, trapping, fishing.
73	2	The best solution is to build a road to the red dog mine sight.
92	1	The SEIS should explore real alternatives to a road across the region. Railway transportation has been dismissed as too expensive by the project proponents but cost should not be a factor when analyzing the protection of sovereign tribal lands and their subsistence resources.
102	8	Wildlife overpasses must be considered to enable wildlife migration. Lower 48 examples give insight into how many overpasses and at what distance between them should be considered. Proposed project impacts will intersect with three caribou herd migratory routes.
109	6	The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.
121	6	Given the history of the Dalton and the mercurial nature of land use law in Alaska, a detailed consideration of impacts from a public road should be included in this permitting process.

Ambler Road Draft Supplemental EIS
Attachment A. Scoping Comments on Alternatives

Letter Number	Comment Number	Scoping Comment
131	2	The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.
135	2	The SEIS also needs to address alternatives, including a no-road alternative.
149	4	The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.
183	7	If a mine or mines are developed in the Ambler Mining District, using an alternative such as the existing DeLong Mountain Transportation System and port facility, which already services the Red Dog Mine, would be more reasonable, less costly to the State of Alaska, and less damaging than the Ambler Road. The revised EIS also should consider a no-action alternative.
194	1	The previous study was rushed and did not fully consider the impacts of the Ambler Road. The EIS needs to address alternatives, including a no-road alternative.
210	2	First, what leaps out to the most casual reader is that the SEIS should seriously consider the no action alternative.
217	1	The FEIS did not take a hard look at reasonable alternatives. Alternatives A and B have significant adverse impacts in the preserve.
217	2	After reviewing information in the FEIS, I recommend that the Supplemental EIS analyze in detail a new Alternative (for reference described as Alternative W1). This alternative would be feasible, prudent, and would result in fewer or less severe adverse impacts upon the preserve.
217	3	The proposed W1 route is consistent with the requirements of ANILCA and NEPA, including the direction in ANILCA that states, "4(b) Congress finds that there is a need for access for surface transportation purposes across the Western (Kobuk River) unit of the Gates of the Arctic National Preserve (from the Ambler Mining District to the Alaska Pipeline Haul Road) and the Secretary shall permit such access in accordance with the provisions of this subsection." The location of proposed Alternative W1 is depicted in Appendix A.1
217	4	Railroad Alternative Concerns BLM's failure to consider a rail option is particularly troubling. BLM states that during screening discussions, concerns were noted about construction costs for an alternative requiring use of a railroad along the same route as AIDEA's proposed route. There is no explanation or justification for BLM's assumption that a road must necessarily accompany a railway. Railroads operate efficiently without parallel roadways in Alaska and the rest of the United States. Indeed, the Alaska Railroad's main line stretches 470 miles to connect Seward to Fairbanks, through varied terrain, and much of that route lacks road access. BLM cannot arbitrarily determine that a road must parallel any potential railway to Ambler in order to make a rail alternative impracticable or to skew its assessment of the potential impacts. The BLM in the FEIS states, "The BLM determined that this alternative is not practical due to substantial material handling inefficiencies at both ends. The BLM determined an isolated rail system, not connected to a port or railroad, to be not practical. It was largely duplicative to the AIDEA-proposed road. With a maintenance road alongside the tracks, it would not have the suggested advantage of discouraging unauthorized users, and it would have similar impacts and no construction or operational cost advantage." A road along a railroad is not necessary. The resource benefits of a railway vs. a roadway greatly outweigh BLM's concerns that a railroad is "not practical due to substantial material handling inefficiencies."
217	5	The proposed Alternative W1 route should be analyzed in detail for both road and railroad construction (without an adjacent road next to the railroad) from the Dayton Highway to the Mining District area. Recognize that the proposed alignment of Alternative W1 may need to be adjusted by the planning team to control for maximum grades.
219	9	For example, there is no occasion to solicit or examine new "alternatives" to the Ambler Road Project because Project alternatives were not identified by federal agencies when they moved for remand.

Letter Number	Comment Number	Scoping Comment
220	5	There is no reason to solicit or examine new "alternatives" to the Ambler Road Project because no error in the FEIS's analysis of Project alternatives was identified by the federal agencies when they moved for remand, and Project alternatives were not the basis of any NEPA claim that Plaintiffs briefed in their combined 160 pages of summary judgment briefs. Moreover, given ANILCA's mandate to permit access through the GAAR to provide surface transportation access linking the Ambler Mining District and Dalton Highway, there is no need to consider alternative routes that do not connect the District with Dalton Highway: "[w]hen the purpose is to accomplish one thing, it makes no sense to consider the alternative ways by which another thing might be achieved."
227	6	it is possible that pressure on state and federal decision-makers would result in the road being opened to full public access.
227	7	agencies need to analyze the following alternatives in the SEIS: i. Single-phase construction alternative or variant. ii. Rail access alternative(s). iii. Western access alternative. iv. Tribal alternative. This alternative would maximize protection by modifying the route and incorporating other design features to prevent direct, indirect, and cumulative impacts on subsistence and cultural resources. Such an alternative would minimize reliance on unproven and ineffective mitigation measures to protect subsistence and cultural resources. (See the letter for more detail.)
227	18	the SEIS must ensure collection of critical new data on fish and fish habitats that would be impacted by the Project. Such data would help protect fish and fish habitats, including through appropriate designs and locations for Project-related culverts and bridges.
227	26	Because the SEIS may analyze other alternatives such as rail, western access, and/or Tribal alternatives (see Section III.), the agencies also would need to analyze the transportation-related impacts on the communities impacted by those alternatives. Notably, a rail alternative direct to Fairbanks would avoid ore transfer impacts, and this would reduce adverse impacts such as air pollution, noise, and traffic in Fairbanks.
228	35	EPA recommends the SEIS reflect the national priority to confront climate change in: * Identifying alternatives (e.g., alternatives which have fewer climate effects). * The selection of the Preferred Alternative for the project. * Describing available mitigation measures to reduce GHG emissions. * Incorporating all practicable mitigation into the SEIS and identifying the commitments made to implement mitigation measures.
228	41	EPA also recommends the SEIS evaluate the alternatives by discussing measures to better align the project with the national 2050 net- zero GHG emissions goal, consistent with the Long-Term Strategy of the United States.
262	8	The SEIS should contain a scenario in which the Ambler Road will not be removed and reclaimed, since that is the most likely outcome based on the history of other BLM or State- permitted mining roads in Alaska.
290	9	The scoping notice solicited comments on whether BLM should expand the SEIS to include an evaluation of additional Project alternatives. 87 Fed. Reg. 57,509 (Sept. 20, 2022). But BLM did not inform the Court or the parties to the pending litigation that it intended to use the limited remand to revisit its alternatives analysis, much less go back to the drawing board to canvass additional alternatives. Similarly, BLM did not initiate consultation with NANA on this subject despite it being a potential decision clearly requiring consultation with impacted Alaska Native corporations and Tribes. Given that no party pursued NEPA claims regarding the sufficiency of the alternatives analysis, BLM should not expand the SEIS to include an evaluation of additional alternatives.
290	10	In addition, BLM need not further consider a western alternative that will fundamentally not meet the project purpose and need. In this case, Congress has defined the Project's purpose and need in specifically approving the construction of a surface transportation route from the Dalton Highway in the east to the Ambler Mineral District in the west through the Gates of the Arctic National Preserve. 16 U.S.C. SS 410hh(4)(b). To the extent the FEIS's purpose and need articulation did not fully embrace Congress's intent by not emphasizing the need to connect to the Dalton Highway, it should be modified in the SEIS.

Ambler Road Draft Supplemental EIS
Attachment A. Scoping Comments on Alternatives

Letter Number	Comment Number	Scoping Comment
290	11	Accordingly, any alternative that is not tied to the Dalton Highway does not satisfy Congressional intent and will not satisfy the project purpose and need. <i>City of Angoon v. Hodel</i> , 803 F.2d 1016, 1021 (9th Cir. 1986) ("When the purpose is to accomplish one thing, it makes no sense to consider the alternative ways by which another thing might be achieved."); <i>West/ands Water Dist. v. US. Dept of Interior</i> , 376 F.3d 853, 868 (9th Cir. 2004) (agency need only evaluate alternatives that are reasonably related to the purposes of the project). And where, as in this case, an action is taken pursuant to a specific statutory objective, the statutory objectives determine the reasonableness of the alternatives considered. <i>West/ands</i> , 376 F.3d at 868. In short, it would be patently unreasonable to expand the scope of the limited remand in this case to consider a western alternative that by definition would not link the Ambler Mining District to the Dalton Highway.
290	12	NANA is aware of no new information that changes the analysis BLM previously undertook finding the western alternatives infeasible, impracticable, yielding significantly greater environmental effects, and failing the project purpose and need. Given the absence of a seriously different picture of the environmental landscape, there was no need and no basis to supplement the alternatives analysis.
300	6	There were many comments in the DEIS relating to missed opportunities for less intrusive access to the Ambler Mining District. I recommend that potential access to tidewater to the west be added to the scope of this SEIS.
300	7	My preference is for the transport corridor for resource extraction to flow west to tidewater, not east to the Dalton Highway. In my opinion, the headwaters of the Kobuk River are more fragile, more scenic and less traveled than the country west of Ambler.
300	8	the alternatives within a similar distance to the Chukchi Sea as the proposed alternatives are to the Dalton Highway have been eliminated in the DEIS screening process. It concerns me that the alternative considered to use the DMTS Port was eliminated.
300	9	AIDEA would be wise to upgrade and expand this port to provide greater capacity and facilitate use of a road to the Ambler Mining District. It eliminates 500 plus miles of road/rail transport to Cook Inlet or PWS ports.
300	11	It is my opinion that estimates for the Action Alternatives in the FEIS are on the low range and estimates for the DMTS road are in the very high range, potentially due to the preponderance of known geotechnical information for Action Alternatives A and B.
308	24	BLM's Alternatives Analysis in the FEIS Was Inadequate.
308	26	BLM Should Consider a Broader Range of Alternatives in the SEIS. The alternatives analysis is utterly lacking because it functionally only has two action alternatives -- one action alternative with differences in routing through Gates of the Arctic, and one other with a southern route. This does not satisfy NEPA's requirements for a reasonable range of alternatives.
308	27	the SEIS should fully consider rail as an alternative for this project. (See the letter for the rationale.)
308	28	BLM failed to fully consider the benefits of the no action alternative on subsistence and sociocultural systems in light of such studies. Further, BLM failed to consider the economic benefits of the no action alternative to both local communities and state taxpayers, among a host of other issues.
308	34	The SEIS Must Consider Foreseeable Impacts from the Road Ultimately Becoming Open to the Public.
308	83	he SEIS Should Consider Alternative Designs and Mitigation Measures to Address Permafrost and Other Impacts.
311	11	The Council emphasizes the environmental impact statement should include the analysis of non-road alternatives to access the proposed mining site, including though not limited to the use of rail to deliver ore to a Bering Sea port. These impacts need to be analyzed in the draft environmental impact statement.
313	11	The SDEIS needs to seriously consider the no-action alternative rather than using it as merely a benchmark or throw-away option. An adequate analysis of all options would almost certainly show the no-action alternative in a favorable light.
313	15	The longest route, Alternative C, which begins at mile 59.5 of the Dalton Highway and lies substantially south of Alternatives A and B would have less impacts to caribou, National Park lands and designated Wilderness.

Letter Number	Comment Number	Scoping Comment
313	16	It appears that Alternative C was generated primarily for the appearance of presenting a "full range" of alternatives. We recommend that a more robust array of alternatives be evaluated that would include rail transportation, because it would eliminate extension of the existing road system and thus foreclose public access via motor vehicles.
324	19	Considering the carbon footprint that construction and operation of the AAP and resulting mines will create, and the and short- and long-term environmental and social costs they will likely impose, a better alternative might be to recover and recycle the millions of tons of metals that are buried in the landfills of Alaskan communities and the U.S., and for AIDEA to invest in developing recycling centers within Alaska or in transporting recovered metals to recycling centers outside of Alaska.
362	4	I think a transportation route west to the coast is a better choice. The development of a port to handle this option would provide even more Alaskan jobs. The port would broaden the economic base in an area that sorely needs it.
368	2	Would a rail line do less damage?
376	3	Overland transportation to the Bering Sea coast is an order of magnitude shorter than the proposed Ambler Road to the Dalton Highway. It possibly could be done by rail.
376	6	Water transportation is more efficient, less fuel intensive, lower cost, and SAFER than rail transportation and both water and rail are MUCH SAFER than trucks for hauling freight.
402	3	A more environmentally friendly way to access the mining district might be a railroad spur from the Red Dog Mine, an existing facility with infrastructure in place.
423	1	The Ambler Access infrastructure/transportation plan ought to consider another route that would restrict public access & not be a one lane industrial road built for international mining corporations, an alternate that would not cross so many streams & creeks or interfere as much with the caribou herds and other creatures that live there.
423	2	Let me propose that another way in is just like Red Dog Mine with its port on the Bering Sea plus a road & conveyor. Its a bit out of the way but extending its road to Ambler could be considered. Closer still is building a new port near or up stream on the Kobuk River (depending upon its navigability for barges & tugboats). Constructing a port there provides a variety of routes into the Ambler Mining District & to the villages of the region. These roads would be significantly shorter and would cross far fewer streams and interfere far less with animal migrations as well as fish habitats.
426	3	Furthermore, AIDEA has not provided adequate design information about the road beyond developing a 1-lane pioneer road that will eventually become a 2-lane gravel road.
435	1	I strongly suggest the current and any further proposals, studies and reviews of ways to mine in the Ambler region be focused on alternative routing to the west of the Ambler district connecting to ocean going modalities.
454	3	The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.
471	2	A much better solution would be to build a road west that allowed mined ores to be trucked to the west coast of Alaska where they could either be processed and/or shipped by sea to a processing plant. I do not want to see trucks coming south to Fairbanks.
485	4	There can be an alternate transport route for their trucks - to create a road west to the Bering Sea.
503	3	The shipping port at Red Dog already exists. Hauling ore concentrate from Ambler mines, via railroad, to this existing port does make sense.
508	2	Please consider private funding since this only benefits private parties. Also building an airstrip with private funds would be less of an impact to the land and probably a cost savings.
509	2	If there are mining developments that are worthy of exploring and exploiting, build an airstrip in the Ambler area that is capable of supporting such needs.
522	4	The SEIS also needs to address alternatives, including a no-road alternative,
536	3	The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.

Ambler Road Draft Supplemental EIS
Attachment A. Scoping Comments on Alternatives

Letter Number	Comment Number	Scoping Comment
542	2	I believe the supplemental EIS needs an alternative that does not lead to a road being built through public land.
545	6	The previous EIS was done under the assumption that the road would be removed after a certain timeframe. The BLM needs to include an alternative in the SEIS that does not include the removal and remediation of the road.
545	8	Though this SEIS is being undertaken to further evaluate effects on subsistence, the BLM must include in their analysis the understanding that Alaska is the last true vestige of wilderness in the United States, we are the last state with caribou. The value of this land and it's wildlife extends beyond subsistence, and far beyond it's minerals and there must be a metric to measure that. As a final request I would ask that the BLM include an alternative in the SEIS that does not include the Ambler Road.
550	1	My question is that besides constructing and maintaining a road, has there been any consideration to expanding the Alaska Railroad to the Ambler mining district? * I am particularly interested to see the calculated cost efficiencies of transporting material per ton on rail versus truck. * Besides the cost of fuel, I would assume the environmental impact per ton of material moved would be less * This could also be seen as potentially opening later to the coast. * Additionally it might also alleviate local concern of reducing the ability of non-locals to visiting the area, so as to not become a conduit like the Dalton Highway opening up the north slope.
565	2	The SEIS must be broad and thoroughly analyze all design components and potential impacts to ensure that the agencies have sufficient information to address them. Baseline information about project design, and fish, caribou, wildlife, wetlands, water quality, and permafrost resources was missing from the previous EIS and needs to be included in the SEIS. The SEIS also needs to address alternatives, including a no-road alternative, and adoption of mitigation measures to minimize impacts of the development, as the alternatives considered in the EIS were effectively the same with major impacts resulting from each, and no measures to address those impacts.
567	4	One analysis I think should be conducted is to explore the costs and benefits of hauling processed mining materials out by airplane compared to building and maintaining either version of the proposed road access.
584	1	Development of the mineral resources from the Ambler mining district should be accomplished using a rail line running west to the existing port at Red Dog, or to a new port near Kotzebue.
596	3	I am not in favor of a road through the area when the possibility of a sea port is much closer to the proposed mine.
619	1	Hello. Have you considered a narrow gauge railroad? It could be a lot easier to reclaim when projects are completed. Could have a car for passengers. Smaller footprint also.
644	5	Wildlife overpasses must be considered to enable wildlife migration. Lower 48 examples give insight into how many overpasses and at what distance between them should be considered. Proposed project impacts will intersect with three caribou herd migratory routes.
653	5	It seems it would make better sense to ship the ore westward via barges on the Kobuk River and use the same port (DeLong Mountain Port) being used by Red Dog mine. This would obviate the need for a road and would provide some jobs along the Kobuk River system. There is already barge traffic on the Kobuk, and transportation costs via water are orders of magnitude cheaper than by road.
669	2	Several alignment routes were considered, including both western and eastern access routes. The Draft EIS offered only the eastern access alternative with minor modifications in routes, negating discussion as to why western route alternatives were dropped from further consideration. The most compelling basis for a western route originating either from Nome or the Red Dog mine port at DTMS is restricting or limiting non-authorized access, a major argument presented in the proposed action. A western access route would be a much more compelling argument in limiting access to the Ambler mining district as it also would be better suited to Northwest Alaska for economic development opportunities.
684	1	INSTEAD OF A ROAD, install an underground HVDC power/fiber cable to Upper Kobuk from Dalton highway. Make provisions for tapping power off at locations along the route for other communities or projects. -use aircraft, barges and winter roads from Kotzebue to bring in equipment&supplies and then ship out ore concentrate via Kotzebue.

Letter Number	Comment Number	Scoping Comment
701	2	Other more purposeful alternatives that should be considered include a roadway or a railroad from the main mining site on private land direct to the seacoast like the Red Dog's 55-mile roadway to a storage facility on the Chukchi Sea. A railroad compared to a roadway would be less costly to construct, maintain and operate year-round and much less of an environmental impact during construction and operation phases other than the ludicrous AEIDEA's roadway alternatives
701	3	Another alternative would be to use Aircargo to transport high quality or processed raw ore directly to where it could be further refined by a smelt rendering process. Air freighting is widely used in other countries with minimal access to distant, remote mining regions. It would be less deleterious to the environment, more expedient to develop or get online and cost much less than the proposed long haul by truck to Fairbanks.
3677	1	Both alternatives would disrupt the entire ecosystem with noise, light, and motorized intrusions into Gates of the Arctic. Both would seriously impact caribou migration. The impacts to those lands must be fully disclosed and analyzed, including the inevitable widespread infiltration by the public using motorized vehicles.
12555	1	Why build in such an inaccessible place that needs vehicles that will use gasoline when we are supposed to quit gasoline transportation? Why not fly out the ores? There are already some communities out there. Surely they fly supplies in and out?
21229	2	If the Ambler/Dalton Road goes through as planned the US military's efforts to develop a strategic plan for the Seward Peninsula and the Northwest Arctic would be stymied and delayed. At present, there is a lack of needed infrastructure in the Seward Peninsula and the Northwest Arctic. Getting supplies in and out of the area is difficult at best.
21229	3	A 360 mile Ambler/Nome Road by contrast would be a first step in creating that infrastructure throughout the region, and opening up access to the Upper Kobuk District and to six other mining districts on the Seward Peninsula. At present these six mining districts have no road access to port. An Ambler/Nome Road would generate the kind of economic activity sorely needed in the region.
21239	12	request that the SEIS include two sets of analyses: one that reflects the impacts if the road remains commercial-only and another in which impacts are analyzed if the road were to become available for public hunting access and other uses.
21255	14	This should include an analysis of train transportation, a western access route, the Tribal alternative (such as that proposed by Tanana Chiefs Conference), the ore export location and transportation to that location.
21257	13	Such alternatives could include rail access; seasonal ice road access; construction of only one phase of the road; aircraft access; barge access; and other alignments coming from the west. And, in analyzing the alternatives, BLM must give full consideration to the No Action alternative. Because the No Action alternative provides the baseline against which all other alternatives are measured, it is critical that there be good baseline data to understand what the "no action" condition is, and how that condition would likely change under the alternative actions. In taking the requisite "hard look" at the No Action alternative, the SEIS will present a clear picture of how each action alternative will affect the environment. It is our belief that the No Action alternative is the only way for the BLM to proceed in a manner that will cause no unnecessary environmental harm.
21264	1	It is important that the Supplemental EIS re-address the alternative routes. My opinion is that the previous EIS was biased towards accepting AIDEA's assumptions, cost estimates and preferred routing. This seems particularly clear when reading the response to comments of the draft EIS. The Supplemental EIS should consider the potential impacts of all the alternative routes (and alternative means of transporting ore) irrespective of cost.
21274	2	Two or three other, more feasible alternatives would be either a railroad, or a regular roadway, extending from the mining site, entirely on privately owned land, direct to a seaport like the Red Dog's 55-mile road to a storage facility on the Chukchi Sea. A railroad from the Mining District through the Kobuk Valley to a storage facility in Kotzebue Sound would be less costly to construct, maintain and operate than a long road to the Dalton Highway.
21274	3	A third alternative would be to ship a high grade or partially refined ore by air. Air freighting is widely used in other countries with minimal access to remote mining regions. It would be less deleterious to the environs, more expedient to develop or get online and cost much less than a multimillion-dollar road to the Dalton Highway.

Ambler Road Draft Supplemental EIS
Attachment A. Scoping Comments on Alternatives

Letter Number	Comment Number	Scoping Comment
21277	13	In the previous EIS, as with other EISs, BLM included an Alternative B, which allowed the proposed road but maximized avoidance and mitigation of environmental damage. While Allakaket supported the environmental conservation methods in this alternative and found it to be the least harmful action alternative, it did not fully address the expected socio-economic impacts of the road, particularly in regard to subsistence access and availability. We encourage BLM to develop an alternative that maximizes avoidance and mitigation of both environmental damage and socio-economic impacts.

Attachment B. Modes Screening Data

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Screening Criterion	I. Effectiveness, Meets Purpose and Need. a. Year-round surface transportation access?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? i. Logical termini?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? i. Support hauling mining equipment/heavy loads?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? a. Constructed Length (miles)	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? a. Distance to Transportation Network (mi) (distance to existing port site)	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Topography	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Poor Soils?	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Difficult River Crossings?	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Access to construction materials?	I. Technical Feasibility a. Existing Technology i. Generally accepted design criteria for the intended mode of transportation and intended uses?	I. Economic Feasibility a. Construction costs reasonable compared to other alternatives?	I. Economic Feasibility a. O&M costs reasonable compared to other alternatives?	I. Practicality a. Requires speculative assumptions or remotely foreseeable circumstances?	I. Practicality a. Practical or not practical using common sense?	I. Duplicative a. Substantially similar to another route?	I. Duplicative a. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration?
Air (general air method)	No, not surface access (not favorable)	Depends on route	No (not favorable)	Depends on route/ airport location	Depends on route/ airport location	Not an issue (acceptable)	Not an issue (acceptable)	Not an issue (acceptable)	Depends on route/ airport location	No. Aircraft generally do not support hauling the kinds of loads and equipment (not favorable)	Yes, airport construction cost would generally be reasonable compared to other modes. (acceptable)	No, the numbers of flights needed to haul the fuel and materials would not be reasonable (because of the small load capacity) (not favorable)	Yes. Because aircraft are not suitable for the kinds of hauling needed, it would be highly speculative to believe mines would be able to develop. (not favorable)	Not Practical. Aircraft are not practical for hauling the heavy loads and kinds of equipment needed. (not favorable)	Depends on route/ airport location	Depends on route/ airport location	Screened out
Air (blimp/dirigible carrier)	No, Not Surface Access (not favorable)	Depends on route	Untested in arctic conditions. (less than favorable or uncertain)	Depends on route/ airport location	Depends on route/ airport location	Not an issue (acceptable)	Not an issue (acceptable)	Not an issue (acceptable)	Depends on route/ airport location	No. Heavy lift dirigibles supporting mining in the arctic do not have generally accepted design criteria. (not favorable)	Unknown (less than favorable or uncertain)	Unknown (less than favorable or uncertain)	Yes. Requires speculation that an untested mode, in dark, harsh arctic environment would be safe and reliable. (not favorable)	Not Practical. An untested mode in the unique environment in the project area is not reasonable using common sense. (not favorable)	Depends on route/ airport location	Depends on route/ airport location	Screened out
Rail -DMTS Port route -Cape Blossom route -Selawik Flats route -Cape Darby route -Parks Hwy route -Route along AIDEA's proposed road route	Yes (acceptable)	Depends on route	Yes (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Yes. Standard design criteria are available. The mode is well established in arctic conditions. (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route; may be duplicative to regular-sized track width (less than favorable or uncertain)	Forwarded on for additional screening (acceptable)
Rail (narrow gauge)	Yes (acceptable)	Depends on route	Yes (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Yes (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route. Not practical for connecting to established ARRC line. Rolling stock cannot be freely interchanged. (less than favorable or uncertain)	Depends on route	Depends on route	Forwarded on for additional screening (acceptable)

Ambler Road Draft Supplemental EIS
Attachment B. Modes Screening Data

Screening Criterion	I. Effectiveness, Meets Purpose and Need. a. Year-round surface transportation access?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? i. Logical termini?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? i. Support hauling mining equipment/heavy loads?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? a. Constructed Length (miles)	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? a. Distance to Transportation Network (mi) (distance to existing port site)	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Topography	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Poor Soils?	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Difficult River Crossings?	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Access to construction materials?	I. Technical Feasibility a. Existing Technology i. Generally accepted design criteria for the intended mode of transportation and intended uses?	I. Economic Feasibility a. Construction costs reasonable compared to other alternatives?	I. Economic Feasibility a. O&M costs reasonable compared to other alternatives?	I. Practicality a. Requires speculative assumptions or remotely foreseeable circumstances?	I. Practicality a. Practical or not practical using common sense?	I. Duplicative a. Substantially similar to another route?	I. Duplicative a. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration?
Rail (elevated)	Yes (acceptable)	Depends on route	Yes (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	No. This is only a concept and has never been built in arctic conditions. (not favorable)	No (Cost per mile approx \$105-130 million) (not favorable)	Unknown (less than favorable or uncertain)	Yes. Requires speculation that an untested mode, in dark, harsh arctic environment would function. (not favorable)	Not Practical. High cost and unproven technology in arctic conditions. (not favorable)	Depends on route	Depends on route	Screened out
Road -AIDEA's proposed route -AIDEA Alternative route -DMTS Port route -Cape Blossom route -Selawik Flats route -Cape Darby route -Variation of Selawik Flats/Cape Darby route to access other mining resources -Route along Kobuk River to tidewater -Road Barge Kobuk River -Elliot Hwy route -Kanuti Flats route -Communities route	Yes (acceptable)	Depends on route	Yes (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Yes. Standard design criteria are available. The mode is well established in arctic conditions. (acceptable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Forwarded on for additional screening (acceptable)
Road (seasonal winter ice road)	No, not year-round (not favorable)	Depends on route	No. Changing climate makes this mode unreliable. (not favorable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	No (not favorable)	Depends on route	No. Ice roads require new construction each winter. (not favorable)	Yes. Requires the assumption that winter climate conditions (which are changing rapidly in the arctic) would remain stable.	No. Reconstructing an ice road each winter at the lengths needed is not practical using common sense. (not favorable)	Depends on route	Depends on route	Screened out

Screening Criterion	I. Effectiveness, Meets Purpose and Need. a. Year-round surface transportation access?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? i. Logical termini?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? i. Support hauling mining equipment/heavy loads?	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? a. Constructed Length (miles)	I. Effectiveness, Meets Purpose and Need. a. Feasibly and practically able to support mining exploration and development activities? a. Distance to Transportation Network (mi) (distance to existing port site)	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Topography	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Poor Soils?	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Difficult River Crossings?	I. Technical Feasibility a. Constructability? (proven construction methods and minimized construction risks) i. Access to construction materials?	I. Technical Feasibility a. Existing Technology i. Generally accepted design criteria for the intended mode of transportation and intended uses?	I. Economic Feasibility a. Construction costs reasonable compared to other alternatives?	I. Economic Feasibility a. O&M costs reasonable compared to other alternatives?	I. Practicality a. Requires speculative assumptions or remotely foreseeable circumstances?	I. Practicality a. Practical or not practical using common sense?	I. Duplicative a. Substantially similar to another route?	I. Duplicative a. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration?
Water (barge/boat) - Improve/dredge Kobuk River	No, not year-round (not favorable)	Depends on route	Depends on route. However, changing climate could affect water levels and reliability. (less than favorable or uncertain)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Barges can haul heavy materials. However, the river systems may be too shallow. Depends on the routes.	Depends on route	Depends on route	Yes. Requires the assumption that winter climate conditions (which are changing rapidly in the arctic) would remain stable. (not favorable)	Depends on route	Depends on route	Depends on route	Screened out
Winter ice -Ice road to lower Kobuk River	No, not year-round (not favorable)	Depends on route	No. Changing climate makes this mode unreliable. (not favorable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	No (not favorable)	Depends on route	No. Ice roads require new construction each winter. (not favorable)	Yes. Requires the assumption that winter climate conditions (which are changing rapidly in the arctic) would remain stable. (not favorable)	No. Reconstructing an ice road each winter at the lengths needed is not practical using common sense. (not favorable)	Depends on route	Depends on route	Screened out
Pipeline	Yes (acceptable)	Depends on route	No. This is only conducive for hauling fuel or potentially slurry. It may be a part of an overall corridor, but it does not support hauling equipment and supplies. (not favorable)	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Depends on route	Yes, for hauling slurry or fuel.	Depends on route	Depends on route	Yes (not favorable)	No (not favorable)	Depends on route	Depends on route	Screened out

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Attachment C. Routes Screening Data

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Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility		Practicality		Duplication				
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termin? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft, and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use? a. Construction costs reasonable compared to other alternatives? b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances? b. Practical or not practical using common sense? c. Unacceptable Environmental Factors	a. Substantially similar to another route? b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?						
AIDEA Proposed Route (rd). GAAR North [Alternative A]	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	211 (acceptable compared with other alternatives)	939 (distance from AMD to Port of Seward) (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	11 (SF299-Jun2016, p2) (acceptable compared with other alternatives)	Assumed similar geotechnical scoring as Original Brooks East Route (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$356 Million (all costs in this column escalated to 2018 dollars; costs are screening-level) (acceptable compared with other alternatives)	\$8-10 Million/year (acceptable)	Includes no speculative assumptions/ foreseeable circumstances. However, assumes adequate capacity/loading facilities at Port of Alaska or other existing port location in Southcentral AK. (acceptable compared with other alternatives)	Appears practical. (acceptable)	• Caribou habitat: 5,861 acres • Anadromous fish streams: 5 • NHD stream crossings: 181 • NHD "riparian" acreage: 86.28 (in this column, caribou and fish stream data calculated in June 2018 using GIS based on a 250-ft wide corridor; calculated in July 2018: number of streams crossed based on USGS National Hydrology Dataset [NHD] and riparian area calculated based on a buffer of NHD lines that intersected a 250-foot ROW, see also table footnote) (acceptable compared with other alternatives)	AIDEA's proposed route	AIDEA's proposed route	Moved forward for further analysis
AIDEA Alternative Route (rd) GAAR South [Alternative B]	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	228 (acceptable compared with other alternatives)	956 (distance from AMD to Port of Seward) (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	11 (SF299-Jun2016, p2) (acceptable compared with other alternatives)	Assumed similar geotechnical scoring as Original Brooks East Route (acceptable compared with other alternatives)	yes (acceptable)	Data not available but construction cost assumed reasonable based on this route being proposed by the applicant and its similarity to the other AIDEA proposed road route (GAAR North) (acceptable compared with other alternatives)	\$9-11M /yr (acceptable)	Includes no speculative assumptions/ foreseeable circumstances. However, assumes adequate capacity/loading facilities at Port of Alaska or other existing port location in Southcentral AK. (acceptable compared with other alternatives)	Appears practical. (acceptable)	• Caribou habitat: 6,382 acres • Anadromous fish streams: 6 • NHD stream crossings: 190 • NHD "riparian" acreage: 95.36 (acceptable compared with other alternatives)	Similar to AIDEA's proposed route	Similar to AIDEA's proposed route	Moved forward for further analysis

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility		Practicality		Duplication						
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termint? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft, and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?		
Original Brooks East (previous DOT&PF alternative)	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	220 (acceptable compared with other alternatives)	923 (distance from AMD to Port of Seward) (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Received 'best' Geotech ranking ("6") (DOT-2011 Geotech memo, p.66 based on length, foundation and permafrost conditions, mat'l site availability, lower score is better; all alts scores range from 6-26) (acceptable compared with other alternatives)	13/5,000ft (DOT-2011 Summ Report, pIII) (acceptable)	100% ("100%" of the corridor has mat'l sites within 10 miles, per DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$473M (acceptable compared with other alternatives)	\$8.5-11M/yr (acceptable compared with other alternatives)	Includes no speculative assumptions/ foreseeable circumstances. However, assumes adequate capacity/loading facilities at Port of Alaska or other existing port location in Southcentral AK. (acceptable compared with other alternatives)	Not practical; Right of way could not be acquired (Village Corp whose land would be needed is on record against the route). Was also screened out in part due to community input for avoiding communities (Evansville/Bettle s) (not favorable compared with other alternatives)	• Caribou habitat: 5,611 acres • Anadromous fish streams: 7 • NHD stream crossings: 173 • NHD "riparian" acreage: 101.07 (acceptable compared with other alternatives)	Similar to AIDEA's proposed route	Similar to AIDEA's proposed route but not as good because of community impact concerns. (not favorable compared with other alternatives)	Screened out
Kanuti Flats Road Route (previous DOT&PF alternative)	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	240 (acceptable compared with other alternatives)	943(distance from AMD to Port of Seward) (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("11") (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (less than favorable or uncertain compared with other alternatives)	14/5,440ft (DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	75% (DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$562M (acceptable compared with other alternatives)	\$9-11.5M/yr (acceptable compared with other alternatives)	Includes no speculative assumptions/ foreseeable circumstances. However, assumes adequate capacity/loading facilities at Port of Alaska or other existing port location in Southcentral AK. (acceptable compared with other alternatives)	Appears generally practical but not as practical as similar (duplicative) routes. (less than favorable or uncertain compared with other alternatives)	• Caribou habitat: 6,343 acres • Anadromous Streams: 11 • NHD stream crossings: 238 • NHD "riparian" acreage: 123.88 (less than favorable or uncertain compared with other alternatives)	Similar to AIDEA's proposed route	Similar to AIDEA's proposed route but not as good. Caribou and Anadromous Stream impacts worse. Community impact concerns. (less than favorable or uncertain compared with other alternatives)	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility					Economic Feasibility		Practicality		Duplication					
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termin? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft; and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration as a reasonable alternative?	
Rail to Dalton Hwy along AIDEA Proposed road route (identified during scoping)	Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	211 (acceptable compared with other alternatives)	939(distance from AMD to Port of Seward) (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	similar to AIDEA's proposed route (acceptable compared with other alternatives)	11 Assumed same # as AIDEA Proposed Route (acceptable compared with other alternatives)	100% (DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.05Billion (not favorable compared with other alternatives)	\$9M/year (acceptable compared with other alternatives)	Requires transfer of material/equipment from train to truck at Dalton Hwy intersection and the west end. Not practical. Requires speculation that locomotives and other equipment could even be shipped up the Dalton Highway to support this isolated rail. (not favorable compared with other alternatives)	Not Practical. Would require multiple transfers of material/equipment between train and truck at Dalton Hwy intersection and other locations (such as the at the mine site/west end of road and in Fairbanks) (not favorable compared with other alternatives)	• Caribou habitat: 5,861 acres • Anadromous fish streams: 5 • NHD stream crossings: 181 • NHD "riparian" acreage: 86.28 (acceptable compared with other alternatives)	Similar to AIDEA's proposed route	Similar to AIDEA's proposed route but is a unique mode (rail).	Screened out	
DMTS Port route (rd) (previous DOT&PF alternative)	Partial. Route is year-round. The port would be seasonal. (less than favorable or uncertain compared with other alternatives)	No. The DMTS port site exists and functions for mineral export and is owned by the applicant. However capacity is too limited and would require additional construction akin to building a new port. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	260 (acceptable compared with other alternatives)	260(distance from AMD to existing DMTS port) (acceptable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("17") (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (less than favorable or uncertain compared with other alternatives)	19/8,440ft (DOT-2011 Summ Report, pIII) (not favorable compared with other alternatives)	70% (DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	Between \$1.02B and \$1.07B (subtotals: road cost: \$793M port cost: \$232M-\$280M) (not favorable compared with other alternatives)	\$10-12.5M/year (acceptable compared with other alternatives)	DMTS port exists but is seasonal (3-4 months) and does not have the capacity or sufficient facilities. Requires speculation construction akin to a new port would need to occur. (not favorable compared with other alternatives)	Not practical due to likely port requirements akin to constructing a new port. Added cost to the applicant not reasonable using common sense. (not favorable compared with other alternatives)	• Caribou habitat: 8,030 acres • Anadromous fish streams: 13 • NHD stream crossings: 269 • NHD "riparian" acreage: 150.96 (less than favorable or uncertain compared with other alternatives)	Similar to DMTS RR route.	Unique mode on this route	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility		Practicality		Duplication		
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termini? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles) b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft, and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives? b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances? b. Practical or not practical using common sense? c. Unacceptable Environmental Factors	a. Substantially similar to another route? b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?				
DMTS Port route (rail) (previous DOT)	Partial. Route is year-round. The port would be seasonal. (less than favorable or uncertain compared with other alternatives)	No. The DMTS port site exists and functions for mineral export and is owned by the applicant. However capacity is too limited and would require additional construction akin to building a new port. (not favorable compared with other alternatives)	260 (acceptable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	19/8,440ft (DOT-2011 <i>Summ Report, pV</i>) (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	Between \$1.61B and \$1.66B (subtotals: rail cost: \$1.46B port cost: \$232M-\$280M) (not favorable compared with other alternatives)	\$11.5M/year (acceptable compared with other alternatives)	DMTS port exists but is seasonal (3-4 months) and does not have the capacity or sufficient facilities. Requires speculation construction akin to a new port would need to occur. (not favorable compared with other alternatives)	Not practical due to likely port requirements akin to constructing a new port. Added cost to the applicant not reasonable using common sense. (not favorable compared with other alternatives)	• Caribou habitat: 8,030 acres • Anadromous fish streams: 13 • NHD stream crossings: 269 • NHD "riparian" acreage: 150.96 (less than favorable or uncertain compared with other alternatives)	Similar to DMTS road route	Unique mode on this route.	Screened out
Road to Kiana area then barge via Kobuk River (Scoping)	Partial. Road is year-round. Port/barge is seasonal (less than favorable or uncertain compared with other alternatives)	No. Port site not available. (not favorable compared with other alternatives)	149 (acceptable compared with other alternatives)	Road is the same as the DMTS route between Ambler Mining District and Kiana. (acceptable compared with other alternatives)	Data not available	Road is the same as the DMTS Route between Ambler Mining District and Kiana. Shallow drafts in the river would not support lightering ore and other heavy equipment. (not favorable compared with other alternatives)	Road construction costs would be less than the DMTS road route, but would need barges also. (acceptable compared with other alternatives)	Road O&M cost less than the DMTS road route, but barge O&M not known. (acceptable compared with other alternatives)	The waterborne distance is long and the hauling must occur in a short summer season. Not practical. (not favorable compared with other alternatives)	Not practical. It is highly unlikely that barging ore and supplies on this route would be feasible, especially considering additional costs due to delays given the short operating window and the unreliability of river depths, the differing drafts/designs of barges on the ocean and in the river, and the importance of the Kobuk for subsistence. (not favorable compared with other alternatives)	• Caribou habitat: 4,497 acres • Anadromous fish streams: 10 • NHD stream crossings: 130 • NHD "riparian" acreage: 71.73 (less than favorable or uncertain compared with other alternatives)	Partly similar to DMTS route	Unique combination of road and barge modes	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)				Technical Feasibility				Economic Feasibility			Practicality		Duplication				
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical terminus? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft, and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration as a reasonable alternative?	
Route west from AMD along Kobuk River to tidewater (scoping)	Partial. Route is year-round. Port is seasonal (less than favorable or uncertain compared with other alternatives)	No. Port site not available at mouth of the Kobuk. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	Not calculated. Does not meet P&N. Not reasonable because it does not connect to a feasible port site.	Not calculated. Does not meet P&N. Not reasonable because it does not connect to a feasible port site. (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Similar to DMTS route but routing is in floodplain/flats. Would have worse soil conditions. (not favorable compared with other alternatives)	No specific route defined. Data not available.	Similar to DMTS route but routing is in floodplain/flats. Likely has less access to construction materials. (not favorable compared with other alternatives)	yes (acceptable)	Cost anticipated to be higher than DMTS road route (based on map inspection) because of construction in the flats (farther from construction materials) with poorer soils in more wetlands / floodplain. (not favorable compared with other alternatives)	Not calculated. Does not meet P&N. Not reasonable because it does not connect to a port	The waterborne distance is long and the hauling must occur in a short summer season. Requires assumption that mining companies could make that short season work given the long water route. Not practical. (not favorable compared with other alternatives)	The waterborne distance is long and the hauling must occur in a short summer season. Not practical. (not favorable compared with other alternatives)	Not calculated. Best engineered route is similar to DMTS Route as far as Kiana.	Similar to DMTS route	Similar to DMTS route	Screened out
Cape Blossom (rd) (previous DOT)	Partial. Route is year-round. The port would be seasonal. (less than favorable or uncertain compared with other alternatives)	No. Port does not yet exist. Speculative - terminus site at Cape Blossom has been identified as a potential deep-water port site. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	250 (acceptable compared with other alternatives)	Does not provide surface access to existing port site. (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("15") (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (less than favorable or uncertain compared with other alternatives)	24/9,250ft (DOT-2011 Summ Report, pIII) (not favorable compared with other alternatives)	10%; limited material sites (DOT-2011 Summ Report, pIII) (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.22B (subtotals: road cost: \$947M port cost: \$275M) (not favorable compared with other alternatives)	\$10-12M/yr (acceptable compared with other alternatives)	Requires speculation that the port site would be developed (not favorable compared with other alternatives)	Not Practical. Does not provide surface access to existing port site. (not favorable compared with other alternatives)	• Caribou habitat: 8,290 acres • Anadromous fish streams: 3 • NHD stream crossings: 260 • NHD "riparian" acreage: 157.54 (less than favorable or uncertain compared with other alternatives)	Not substantially similar to another route; however, route shares some of the Cape Darby and Selawik Flats route	Not applicable.	Screened out
Cape Blossom (rail) (previous DOT)	Partial. Route is year-round. The port would be seasonal. (less than favorable or uncertain compared with other alternatives)	No. Port does not yet exist. Speculative - terminus site at Cape Blossom has been identified as a potential deep-water port site. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	250 (acceptable compared with other alternatives)	Does not provide surface access to existing port site (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("15") (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (less than favorable or uncertain compared with other alternatives)	24/9,250ft (DOT-2011 Summ Report, pV) (not favorable compared with other alternatives)	10%; limited material sites (DOT-2011 Summ Report, pV) (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.74B (subtotals: rail cost: \$1.47B port cost: \$275M) (not favorable compared with other alternatives)	\$11M/yr (acceptable compared with other alternatives)	Requires speculation that the port site would be developed (not favorable compared with other alternatives)	Not practical. Does not provide surface access to existing port site. (not favorable compared with other alternatives)	• Caribou habitat: 8,290 acres • Anadromous fish streams: 3 • NHD stream crossings: 260 • NHD "riparian" acreage: 143.0 (less than favorable or uncertain compared with other alternatives)	Not substantially similar to another route; however, route shares some of the Cape Darby and Selawik Flats route	Not applicable.	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility			Practicality		Duplication			
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical terminus? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft; and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?
Selawik Flats (rd) (previous DOT)	Yes. Route is year-round. The reasonably foreseeable Port of Nome is assumed to support year-round operations with the use of ice breakers (acceptable compared with other alternatives)	Yes. Logical terminus would be the proposed deep water port at Nome, which is a reasonably foreseeable action with an estimated completion date of 2030 (acceptable compared with other alternatives)	360 (less than favorable or uncertain compared with other alternatives)	402 distance from AMD to existing Nome port (acceptable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("13") (DOT-2011 <i>Summ Report, pIII</i>) <i>Geotech memo, p.66, lower score is better; all alts scores range 6-26</i> (less than favorable or uncertain compared with other alternatives)	21/7,470ft (DOT-2011 <i>Summ Report, pIII</i>) (less than favorable or uncertain compared with other alternatives)	57%; limited material sites; (DOT-2011 <i>Summ Report, pIII</i>) (less than favorable or uncertain compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.33B (subtotals: road cost: \$1.06B port cost: \$275M) (not favorable compared with other alternatives)	\$13-16M/yr (less than favorable or uncertain compared with other alternatives)	Includes reasonably foreseeable circumstances (construction of Port of Nome) and speculative assumptions regarding the port's estimated completion date (currently estimated to be 2030), storage capacity (TBD), and whether year-round access would be possible (i.e., with an ice breaker). In addition, this alternative assumes that Nome-Council Road may need to be improved. (less than favorable or uncertain compared with other alternatives)	Appears practical (acceptable)	• Caribou habitat: 10,934 acres • Anadromous fish streams: 18 • NHD stream crossings: 257 • NHD "riparian" acreage: 143.37 (not favorable compared with other alternatives)	Route shares a substantial amount with the Cape Darby route	Not applicable. Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility			Practicality		Duplication				
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical terminus? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft; and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration as a reasonable alternative?
Selawik Flats (rail) (previous DOT)	Yes. Route is year-round. The reasonably foreseeable Port of Nome is assumed to support year-round operations with the use of ice breakers (acceptable compared with other alternatives)	Yes. Logical terminus based on the assumption that the terminus is the proposed deep water port at Nome, which is a reasonably foreseeable action with an estimated completion date of 2030 (acceptable compared with other alternatives)	330 (less than favorable or uncertain compared with other alternatives)	402 distance from AMD to existing Nome port (acceptable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("13") (DOT-2011 <i>Summ Report, pV</i>) (less than favorable or uncertain compared with other alternatives)	21/7,470ft (DOT-2011 <i>Summ Report, pV</i>) (less than favorable or uncertain compared with other alternatives)	57%; limited material sites (DOT-2011 <i>Summ Report, pV</i>) (less than favorable or uncertain compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.99B (subtotals: road cost: \$1.72B port cost: \$275M) (not favorable compared with other alternatives)	\$15M/yr (less than favorable or uncertain compared with other alternatives)	Includes reasonably foreseeable circumstances (construction of Port of Nome) and speculative assumptions regarding the port's estimated completion date (currently estimated to be 2030), storage capacity (TBD), and whether year-round access would be possible (i.e., with an ice breaker). In addition, this alternative assumes that Nome-Council Road may need to be improved (less than favorable or uncertain compared with other alternatives)	Appears practical (acceptable)	• Caribou habitat: 10,934 acres • Anadromous fish streams: 18 • NHD stream crossings: 257 • NHD "riparian" acreage: 143.37 (not favorable compared with other alternatives)	Route shares a substantial amount with the Cape Darby route	Not applicable.	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility		Practicality		Duplication						
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical terminus? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles) b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft; and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use? a. Construction costs reasonable compared to other alternatives? b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances? b. Practical or not practical using common sense? c. Unacceptable Environmental Factors a. Substantially similar to another route? b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?										
Nome Route (rd) (suggested by Doyon post-scoping)	Yes. Route is year-round. The reasonably foreseeable Port of Nome is assumed to support year-round operations with the use of ice breakers (acceptable compared with other alternatives)	Yes. Logical terminus would be the proposed deep water port at Nome, which is a reasonably foreseeable action with an estimated completion date of 2030 (acceptable compared with other alternatives)	Yes. Assumes adequate capacity/loading facilities would exist at the Port of Nome(acceptable compared with other alternatives)	388 (less than favorable or uncertain compared with other alternatives)	460 distance from AMD to existing Nome port (acceptable compared with other alternatives)	Questionable. Route goes through very mountainous terrain. (less than favorable or uncertain compared with other alternatives)	Data Not Available	Data Not Available	Data Not Available	yes (acceptable compared with other alternatives)	Cost data not available. Anticipated to be as high or potentially higher than other nearby routes (Cape Darby or Selawik Flats) due to steeper terrain (not favorable compared with other alternatives)	Data Not Available	Includes reasonably foreseeable circumstances (construction of Port of Nome) and speculative assumptions regarding the port's estimated completion date (currently estimated to be 2030), storage capacity (TBD), and whether year-round access would be possible (i.e., with an ice breaker). In addition, this alternative assumes that Nome-Council Road may need to be improved (less than favorable or uncertain compared with other alternatives)	Appears generally practical. However, technical feasibility concerns, cost, and environmental impacts remain high (less than favorable or uncertain compared with other alternatives)	• Caribou habitat: 11,738 acres • Anadromous fish streams: 13 • NHD stream crossings: 171 • NHD "riparian" acreage: 151.7 (not favorable compared with other alternatives)	Similar to Cape Darby and Selawik Flats routes	Similar to Cape Darby and Selawik Flats routes. Mountainous terrain is problematic.	Screened out
Cape Darby (rd) (previous DOT)	Partial. Route is year-round. The port would be seasonal. (less than favorable or uncertain compared with other alternatives)	No. Deep water port does not yet exist. Speculative - terminus site been identified as a potential deep-water port site. Accessing other mining districts not supported by purpose and need. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	340 (less than favorable or uncertain compared with other alternatives)	Does not provide surface access to existing port site (not favorable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("12") (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (less than favorable or uncertain compared with other alternatives)	25/7,890ft (DOT-2011 Summ Report, pIII) (less than favorable or uncertain compared with other alternatives)	58%; limited material sites (DOT-2011 Summ Report, pIII) (less than favorable or uncertain compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.32B (subtotals: road cost: \$1.06B port cost: \$275M) (not favorable compared with other alternatives)	\$13-16M/yr (less than favorable or uncertain compared with other alternatives)	Requires speculation that the port site would be developed (not favorable compared with other alternatives)	Not Practical. Does not provide surface access to existing port site. (not favorable compared with other alternatives)	• Caribou habitat: 11,203 acres • Anadromous fish streams: 14 • NHD stream crossings: 280 • NHD "riparian" acreage: 236.12 (not favorable compared with other alternatives)	Route shares a substantial amount with the Selawik Flats route	Not applicable.	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility		Practicality		Duplication						
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termini? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles) b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft, and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles) b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives? b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances? b. Practical or not practical using common sense? c. Unacceptable Environmental Factors	a. Substantially similar to another route? b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?									
Cape Darby (rail) (previous DOT)	Partial. Route is year-round. The port would be seasonal. (less than favorable or uncertain compared with other alternatives)	No. Deep water port does not yet exist. Speculative - terminus site been identified as a potential deep-water port site. Accessing other mining districts not supported by purpose and need. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	340 (less than favorable or uncertain compared with other alternatives)	Does not provide surface access to existing port site (not favorable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("12") (DOT-2011 <i>Summ Report, pV</i>) <i>Geotech memo, p.66, lower score is better; all alts scores range 6-26</i> (less than favorable or uncertain compared with other alternatives)	25/7,890 ft (DOT-2011 <i>Summ Report, pV</i>) (less than favorable or uncertain compared with other alternatives)	58%; limited material sites (DOT-2011 <i>Summ Report, pV</i>) (less than favorable or uncertain compared with other alternatives)	yes (acceptable compared with other alternatives)	\$2.0B (subtotals: rail cost: \$1.73B port cost: \$275M) (not favorable compared with other alternatives)	\$15M/yr (less than favorable or uncertain compared with other alternatives)	Requires speculation that the port site would be developed (not favorable compared with other alternatives)	Not Practical. Does not provide surface access to existing port site. (not favorable compared with other alternatives)	• Caribou habitat: 11,203 acres • Anadromous fish streams: 14 • NHD stream crossings: 280 • NHD "riparian" acreage: 236.12 (not favorable compared with other alternatives)	Route shares a substantial amount with the Selawik Flats route	Not applicable.	Screened out
Variation of Selawik Flats/Cape Darby routes to access other nearby mining resources (scoping)	Partial. Route is year-round. Assumes the reasonably foreseeable Port of Nome supports year-round operations with the use of ice breakers) or the Cape Darby Port would be seasonal (Cape Darby) (less than favorable or uncertain compared with other alternatives)	Partial. Terminus site (deep water port) is reasonably foreseeable at Nome but does not yet exist at Cape Darby. Accessing other mining districts not supported by purpose and need. (not favorable compared with other alternatives)	yes (acceptable compared with other alternatives)	Not calculated. Does not meet P&N. No logical termini. (not favorable compared with other alternatives)	Not calculated. Does not meet P&N. No logical termini. (not favorable compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	depends on route, though likely 12 (similar to Cape Darby) or 13 (similar to Selawik) (less than favorable or uncertain compared with other alternatives)	No specific route defined. Data not available.	No specific route defined. Data not available.	yes (acceptable compared with other alternatives)	Similar to Cape Darby or Selawik Flats routes. See costs above (not favorable compared with other alternatives)	Similar to Cape Darby and Selawik Flats routes. See cost above (less than favorable or uncertain compared with other alternatives)	Either requires speculation that the port site at Cape Darby would be developed or includes reasonably foreseeable circumstances (construction of the Port of Nome) and assumes adequate capacity/loading facilities would exist at the Port of Nome (not favorable compared with other alternatives)	Not Practical. Does not provide surface access to existing port site. (not favorable compared with other alternatives)	Likely similar impact at Cape Darby and Selawik Flats routes. (not favorable compared with other alternatives)	Substantially Similar to Cape Darby and Selawik Flats route. (not favorable compared with other alternatives)	Substantially Similar to Cape Darby; Selawik Flats route. Variations to the routes but would add length and impacts yet accessing other mining areas not supported by P & N. (not favorable compared with other alternatives)	Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility			Practicality		Duplication				
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termini? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft, and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics? Screened out or moved forward for further consideration as a reasonable alternative?	
Parks Hwy Rail Route (4 variants) (previous DOT)	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	420-450 (not favorable compared with other alternatives)	851-881 distance from AMD to existing Port of Seward (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking score range: 19-26 (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (not favorable compared with other alternatives)	Ranges from 13 to 17 / 7,470ft-10,670 ft (DOT-2011 Summ Report, pV) (not favorable compared with other alternatives)	96% (DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$2.07-2.21B (not favorable compared with other alternatives)	\$18.5-20M/yr (not favorable compared with other alternatives)	no (acceptable)	Uncertain: May not be practical given the length, cost, and environmental factors if other better alternatives exist. May result in a redundant infrastructure if an adjacent service road is constructed to provide access along the rail line. (less than favorable or uncertain compared with other alternatives)	• Caribou habitat: 5,403 to 6,153 acres • Anadromous fish streams: 11 to 17 • NHD stream crossings: 259 to 343 • NHD "riparian" acreage: 161.84 to 182.81 (not favorable compared with other alternatives)	Unique route / mode.	Unique route / mode. Screened out
Elliott Hwy Road Route (previous DOT)	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	370 (less than favorable or uncertain compared with other alternatives)	996 distance from AMD to existing Port of Seward (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Geotech ranking ("21") (DOT-2011 Geotech memo, p.66, lower score is better; all alts scores range 6-26) (not favorable compared with other alternatives)	12/7,360ft (DOT-2011 Summ Report, pIII) (less than favorable or uncertain compared with other alternatives)	84% (DOT-2011 Summ Report, pIII) (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$1.09B (not favorable compared with other alternatives)	\$14-18M/yr (not favorable compared with other alternatives)	no (acceptable compared with other alternatives)	Uncertain: May not be practical given the length, cost, and environmental factors if other better alternatives exist. (less than favorable or uncertain compared with other alternatives)	• Caribou habitat: 6,330 acres • Anadromous fish streams: 13 • NHD stream crossings: 288 • NHD "riparian" acreage: 155.56 (less than favorable or uncertain compared with other alternatives)	Unique route / mode, though shares some portions with the Communities Route.	Shares some portions with the Communities route, but longer. (less than favorable or uncertain compared with other alternatives) Screened out

Screening Criterion	Effectiveness (Meets Purpose and Need)			Technical Feasibility				Economic Feasibility			Practicality		Duplication				
	a. Year-round surface transportation access?	b. Feasibly and practically able to support mining exploration and development activities? 1. Logical termin? b. 2. Support hauling mining equipment/ heavy loads?	b. 3. Constructed Length (miles)	b. 4. Distance to Transportation Network (mi) (distance to existing port site)	a. Constructability? (proven construction methods and minimized construction risks) 1. Topography	a. 2. Poor soils? (peat prone/wetland soils and permafrost)	a. 3. Difficult River Crossings? (number of large bridges, greater than 140 ft; and/or total length of large bridges in feet)	a. 4. Access to construction materials? (gravel) (percent of corridor with material sites within 10 miles)	b. Existing Technology 1. Generally accepted design criteria for the intended mode of transportation and intended use?	a. Construction costs reasonable compared to other alternatives?	b. O&M costs reasonable compared to other alternatives?	a. Includes speculative assumptions or remotely foreseeable circumstances?	b. Practical or not practical using common sense?	c. Unacceptable Environmental Factors	a. Substantially similar to another route?	b. Similar to (but not as good as) an alternative with similar routing or other key characteristics?	Screened out or moved forward for further consideration as a reasonable alternative?
Communities Route: Tanana-Hughes-Hogatza-Kobuk (road) (scoping) [Alternative C]	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	306 (less than favorable or uncertain compared with other alternatives)	932 distance from AMD to existing Port of Seward (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Similar to Parks Hwy RR / Elliott Hwy. (not favorable compared with other alternatives)	Similar to Parks Hwy RR or Elliott Hwy. (not favorable compared with other alternatives)	Similar to Elliott Hwy and Parks Hwy RR routes (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$867M (subtotal: road cost: \$775M Yukon River Bridge Crossing: \$150M) (less than favorable or uncertain compared with other alternatives)	\$12-15M/yr (less than favorable or uncertain compared with other alternatives)	no (acceptable compared with other alternatives)	Compared to other alternatives, scoping comments from Kobuk, Shungnak, and Hughes showed some support of a road, which makes connecting the route to these communities appear practical. However, length and cost may be less practical if better alternatives exist. (less than favorable or uncertain compared with other alternatives)	• Caribou habitat: 5,126 acres • Anadromous fish streams: 7 • NHD stream crossings: 281 • NHD "riparian" acreage: 249.69 (less than favorable or uncertain compared with other alternatives)	Shares portions of Elliott Hwy Route. Overall, unique route.	Unique route / mode.	Initially moved forward for further analysis, but refined. Not carried forward on its original alignment. See next row.
Alternative C Refined	Yes. Route is year-round. Port is year-round. (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	332 (less than favorable or uncertain compared with other alternatives)	882 distance from AMD to existing Port of Seward (less than favorable or uncertain compared with other alternatives)	Can be designed to avoid steep topography (acceptable compared with other alternatives)	Similar to Parks Hwy RR / Elliott Hwy. (not favorable compared with other alternatives)	14 large bridge crossings (acceptable compared with other alternatives)	Similar to Elliott Hwy and Parks Hwy RR routes (acceptable compared with other alternatives)	yes (acceptable compared with other alternatives)	\$775 (less than favorable or uncertain compared with other alternatives)	\$13-16M/yr (less than favorable or uncertain compared with other alternatives)	no (acceptable compared with other alternatives)	Compared to other alternatives, scoping comments from Kobuk, Shungnak, and Hughes showed some support of a road, which makes connecting the route to these communities appear practical. However, length and cost may be less practical if better alternatives exist. (less than favorable or uncertain compared with other alternatives)	• Caribou habitat: 7,889 acres • Anadromous fish streams: 10 • NHD stream crossings: 249 • NHD "riparian" acreage: 76 (uncertain compared with other alternatives)	Unique route / mode.	Unique route / mode.	Moved forward for further analysis

Note: Text in parenthesis describing favorability as compared to other alternatives is not intended to be a ranking, but rather to draw attention for discussion purposes. *Italic text represents source documents.*

Footnote: Scoping comment suggested variation across Kobuk River: Move the Kobuk River crossing(s) downstream of Pah River confluence

Footnote for cost criterion: For the economic feasibility criterion, costs for alternatives were derived largely from the DOT&PF effort in 2011-2012 and the applicant's materials. For alternatives not considered previously and did not have original costs calculated, costs were extrapolated from these existing data sources. Older costs were escalated to 2018 dollars. Growth rates were based on the Bureau of Labor Statistics Urban Alaska Consumer Price Index. Escalation rates used were as follows: from 2011 to 2018: 10.1%; from 2012 to 2018: 7.7%; and from 2016 to 2018: 1.8%. Also, some numbers have been rounded.

Footnote for environmental factors: NHD riparian data was used as 'proxy' for wetlands data, because available wetlands data was determined inaccurate in August 2018. Riparian area was calculated based on a buffer of NHD lines that intersected the 250-foot ROW, as follows: Artificial Route – Code: 58800 – 500ft width; Perennial Route – Code: 46006 – 50ft width; Intermittent Route – Code: 46003 – 20ft width; Canal/Ditch Route – Code: 33600 – 10ft width.

Key Sources:

Ambler Road Draft Supplemental EIS
Attachment C. Routes Screening Data

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Appendix H. Indirect and Cumulative Scenarios

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Acronyms

AAC	Alaska Administrative Code
AADT	Annual Average Daily Traffic
ACEC	Area of Critical Environmental Concern
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
AIDEA	Alaska Industrial Development and Export Authority
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
ASTAR	Arctic Strategic Transportation and Resources
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DMTS	Delong Mountains Transportation System
DOT&PF	Alaska Department of Transportation and Public Facilities
DWT	dead weight tons
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FFS	Final Feasibility Study
GAAR	Gates of the Arctic National Park and Preserve
GHG	greenhouse gases
HHH	Hodzana Hills Herd
LNG	liquefied natural gas
MMA	Minimum Annual Assessment
MP	Milepost
NAAQS	National Ambient Air Quality Standards
NANA	NANA Regional Corporation
NAB	Northwest Arctic Borough

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Appendix H. Indirect and Cumulative Scenarios

NEPA	National Environmental Policy Act
NOA	naturally occurring asbestos
NPR-A	National Petroleum Reserve-Alaska
OHV	off-highway vehicle
OTZ	OTZ Telephone Cooperative
PAH	polycyclic aromatic hydrocarbon
PEA	preliminary economic assessment
PFS	Pre-feasibility Study
PGE	platinum group element
REE	rare earth element
RFA	reasonably foreseeable action
RMH	Ray Mountains Herd
ROW	right-of-way
TAPS	Trans-Alaska Pipeline System
TMF	tailings management facility
USACE	U.S. Army Corps of Engineers
WAH	Western Arctic Caribou Herd
YKCA	Yukon-Kuskokwim Census Area

1. Introduction

This appendix describes the indirect and cumulative scenarios and assumptions associated with the Ambler Road based on reasonably foreseeable development caused by the road, taking into account past and present actions and other reasonably foreseeable actions (RFAs). According to the federal Council on Environmental Quality (CEQ), indirect effects “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 Code of Federal Regulations [CFR] 1508.8). The Bureau of Land Management (BLM) considers mine development and changes to community access to be reasonably foreseeable, should a road be constructed. CEQ defines cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

2. Reasonably Foreseeable Actions*

The following sections present a forecast of mining development and activity and other past, present, and reasonably foreseeable actions and analyzes the anticipated indirect and cumulative effects of those actions.

The BLM and cooperating agencies re-examined RFAs from the 2020 Final EIS and made updates, as necessary, to incorporate new and updated information throughout this appendix. Updates made for the Supplemental EIS include the following:

- Minor updates were made to the ownership and status of mineral exploration projects.
- Assumptions were updated for the hypothetical mining development scenario related to construction phasing. Two options for construction phasing are now considered possible based on the range of alternatives analyzed in the Supplemental EIS (including both 2-phase and 3-phase alternatives).
- Updates were made to other uses of the road, including commercial use, public use, and unauthorized use (i.e., trespass).
- Updates were made to the status of existing and reasonably foreseeable Dalton Highway Improvement projects and the inclusion of the Willow Project, which will result in increased traffic on the Dalton Highway.
- New RFAs were added which were not previously considered in the Final EIS: OTZ Telephone Cooperative (OTZ) communication towers, fiber-optic development funding, proposed Alaska Native Claims Settlement Act (ANILCA) 17(d)(1) withdrawals, the Port of Nome Expansion Project, Port of Alaska modernizations, and the Mahn Choh mining project.

2.1. Mining Development Scenario in the Ambler Mining District*

The Alaska Industrial Development and Export Authority (AIDEA) has proposed a road for access to the Ambler Mining District (District), with the assumption that providing access will indirectly lead to

mining exploration and development. This Supplemental Environmental Impact Statement (EIS) is not in response to a mining proposal. Therefore, direct impacts are those that occur at the time and place of road construction. Direct impacts are attributable to the footprint the construction of the road and the road itself would make on the land in the project area and include the anticipated use of the road. The BLM considers mining exploration and mine development reasonably foreseeable if the road were built as AIDEA has stated at Draft EIS public meetings and indicates on its website that the project would not move ahead with road construction until legal agreements were in hand with the mining companies that would use the road. Therefore, this analysis treats impacts resulting from mining exploration and development anticipated to occur off the road and later in time as indirect effects. Mining effects are also considered as cumulative effects.

AIDEA has provided details regarding the proposed road, but no similar details were provided for mining proposals. To evaluate the indirect and cumulative effects of reasonably foreseeable development, the BLM convened a team of agency and private sector National Environmental Policy Act (NEPA) and mining professionals, and consulted with AIDEA and companies that anticipate mining in the District to gather information to inform development of a reasonable mining scenario. This scenario presents a forecast of mining development and activity and other reasonably foreseeable development in the area in the decades following its completion.

Construction and operation of an all-season, industrial access road to the District is intended to and would open the area to mining activities. The hypothetical baseline scenario provided in this appendix is an estimate of the levels of mining-related activities based on current information about the deposits and typical scenarios for mining development in Alaska. To avoid underestimating effects, the hypothetical scenario represents a high-production rate and favorable market prices.

This chapter lays out the reasonably foreseeable mining development scenario anticipated to result from development of the Ambler Road (road). Indirect effects based on this scenario are described in Section 3, Indirect and Cumulative Impacts.

2.1.1 Overview

The District is located in the Northwest Arctic Borough (NAB) along the southern foothills of the Brooks Range in north-central Alaska. Map 1 illustrates the location of the District relative to the industrial access road alternatives and other mining activities in the region. The District area has long been recognized as containing a variety of valuable mineral resources, and these resources have been explored or evaluated for more than a century (DOWL 2016). The primary identified mineral resources include copper, lead, zinc, silver, and gold (DOWL 2016). Development of a mine is primarily dependent on the economic feasibility of the endeavor, which includes several factors:

- **Technical analysis:** extent of the mineral deposit, purity of the mineral, ability to extract the mineral ore
- **Financial analysis:** market analysis, availability and location of the potential work force, access for mine exploration and development (via airplane, boat, or road), mineral extraction methods
- **Legal analysis:** land ownership, mining claim status
- **Environmental analysis:** environmental impacts, permitting, reclamation

Economic feasibility is still being determined for specific mine developments, but it is anticipated that with development of the industrial access road, mine development in the District would proceed. As stated in AIDEA's purpose and need for the project, the construction of an industrial access road is consistent with AIDEA's mission to increase job opportunities and otherwise encourage the economic

growth of the state, including the development of its natural resources (DOWL 2016). Specifically, AIDEA's purpose for this project is to support mineral resource exploration and development in the District. The road would provide surface transportation access to the District to allow for expanded exploration, mine development, and mine operations at mineral prospects throughout the District. AIDEA indicates that surface transportation access would help to bring the high-value mineral resource areas into production (DOWL 2016).

AIDEA also lists multiple public benefits related to the project purpose, including direct employment for road construction and operation, indirect employment related to mining, revenues paid by mining companies to local and state governments and Alaska Native corporations, and commercial access opportunities for nearby communities associated with proximity to a road (DOWL 2016).

2.1.2 Description of Geology*

Physiography

The District contains 3 different physiographic provinces. Wahrhaftig (1965) continues to be the definitive reference for the descriptions of these provinces, and the following are excerpts from that reference dealing with physiographic areas which are present in the District. See https://ngmdb.usgs.gov/Prodesc/proddesc_4487.htm for a map of the provinces. See also *Mineral Occurrence and Development Potential Report-Leasable for the Central Yukon Resource Management Plan* (BLM 2018a).

1. Central and Eastern Brooks Range (6)

General Topography – The central and eastern Brooks Range is a wilderness of rugged glaciated east-trending ridges that rise to generally accordant summits 7,000 to 8,000 feet in altitude in the northern part and 4,000 to 6,000 feet in altitude in the southern part. The easterly grain of the topography is due to belts of hard and soft sedimentary and volcanic rocks. The mountains have cliff-and-bench slopes characteristic of glacially eroded bedded rocks. Abrupt mountain fronts face foothills and lowlands on the north.

Drainage – The drainage divide between the Bering Sea and Arctic Ocean drainages is near the northern edge of the range west of longitude 149 degrees west and in the center of the range east of longitude 149 degrees west. The major rivers flow north to the Arctic Ocean and south to the Yukon, Koyukuk, and Kobuk rivers in flat-floored, glaciated valleys 1 to 2 miles wide; they have a broad dendritic pattern. Minor tributaries flow east and west parallel to the structure, superposing a trellised pattern on the dendritic pattern of the major drainage.

Lakes – Large rock-basin lakes lie at the mouths of several large glaciated valleys on the north and south sides of the range. The Brooks Range in general is characterized by a paucity of lakes for a glaciated area.

Glaciers – Small cirque glaciers are common in the higher parts of the range, in the Schwatka Mountains (6a), and in mountains around Mount Doonerak. The firn line is at an altitude of about 6,000 feet in north-facing cirques and about 8,000 feet in south-facing cirques. Valley glaciers 6 miles long are fed from cirques and small icecaps in the Romanzof Mountains (6b).

Geology – The central and eastern Brooks Range is composed chiefly of Paleozoic limestone, shale, quartzite, slate, and schist. Northeast of the Sagavanirktok River the Paleozoic rocks are in faulted folds overturned to the north. Elsewhere they are in giant plates or nappes thrust to the north. The deformation is of Laramide age. The north front of the range is made of light-colored cliff-forming Mississippian limestone. Rocks south of latitude 68 degrees north are

metamorphosed and generally equivalent in age to those farther north. Granitic intrusions underlie the higher parts of the Schwatka Mountains (6a) and Romanzof Mountains (6b), both of which rise to 8,500 to 9,000 feet in altitude.

2. Ambler Chandalar Ridge and Lowland Section (7)

General Topography – This section consists of 1 or 2 east-trending lines of lowlands and low passes 3 to 10 miles wide and 200 to 2,000 feet above sea level, bordered on the north by the abrupt front of the Brooks Range. Along the south side is a discontinuous line of rolling to rugged ridges, 25 to 75 miles long and 5 to 10 miles wide, rising to 3,000 to 4,500 feet in altitude. Some of these ridges are intensely glaciated. Within the lowlands are east-trending ridges 5 to 10 miles long.

Drainage – The western part of the section is drained by tributaries of the Kobuk River, the central part by the Koyukuk River and its tributaries, and the eastern part by the Chandalar River. Most streams flow south out of the Brooks Range across both the lowlands and the ridges to lowlands farther south. The drainage was probably superposed but may have been disoriented later by glaciers. The Chandalar River flows east along the eastern part of the trough.

Lakes – Several large lakes fill ice-carved rock basins in deep, narrow canyons across the southern ridge. Areas of ground and end moraines contain many ponds. The floodplains of the major streams have thaw lakes and oxbow lakes.

Glaciers and permafrost – The section contains no glaciers but is underlain by continuous permafrost.

Geology – The ridges are composed in part of resistant massive greenstone (metamorphosed basalt) of Mesozoic age. The lowlands are underlain largely by Cretaceous sedimentary rocks folded into synclines. Pleistocene glaciers from the Brooks Range extended across the lowland and through passes in the line of ridges.

3. Baird Mountains (6)

General topography – Moderately rugged mountains having rounded to sharp summits 2,500 to 3,000 feet in altitude rise abruptly from lowlands on the south and west to a subsummit upland along the crest of the Baird Mountains. This subsummit upland slopes gently northward and merges with the Aniuk Lowland and Cutler River Upland. Scattered groups of higher mountains (3,500–4,500 feet in altitude) rise above the subsummit upland; they were centers of glaciation in Pleistocene time. The indistinct boundary with the Schwatka Mountains on the east is drawn where the relief increases abruptly eastward.

Drainage – The Baird Mountains are drained by streams that flow north to the Noatak River and south to the Kobuk River. The south-flowing streams head in narrow ravines with steep headwalls, several hundred feet high, incised in broad, flat passes that are the beheaded parts of north-draining valleys. This relationship indicates that the divide is migrating to the north by headward erosion.

Lakes and glaciers – There are no lakes or glaciers in the Baird Mountains.

Geology – Schist, quartzite, and limestone of Paleozoic age make up most of the Baird Mountains. Structural trends are eastward, and the internal structure is probably anticlinorial. Differential erosion involving limestone and volcanic rocks of a northeast-trending anticline along the northwestern border of the mountains has produced prominent northeast-trending ridges.

2.1.3 Past and Present Mineral Exploration and Development Potential*

The District has been explored for mineral potential since the 1950s and contains one of Alaska’s major mineral belts (Grybeck et al. 1996). NovaCopper U.S., Inc. (now Trilogy Metals, Inc. [Trilogy] or Ambler Metals LLC¹), Valhalla Mining, LLC (Valhalla), and Teck Resources, Inc. (Teck), have staked more than 160,000 acres of mining claims in the District. There are 4 major mineral deposits within the District: Arctic, Bornite, Sun, and Smucker, which are shown on Map 2. These 4 deposits have the potential to provide copper, zinc, lead, silver, and gold ore (Cardno 2015). The anticipated mineral resource in the District is 221,900,000 tonnes² of ore (Cardno 2015; Trilogy 2018a, 2018b). Table 2-1 highlights the potential mineral resources for each of the 3 companies that have staked the majority of claims in the District.

Table 2-1. Estimated resources for 4 major deposits in the District

Deposit	Owner	2018 mineral resource (million tonnes)	Ore concentrates
Arctic	Ambler Metals (formerly Trilogy Metals, Inc.)	43	Cu, Zn, Pb, Ag, Au
Bornite	Ambler Metals (formerly Trilogy Metals, Inc.)	182	Cu, Co
Sun	Valhalla Mining, LLC	11	Cu, Zn, Pb, Ag, Au
Smucker	Teck Resources, Inc.	11.6	Cu, Zn, Pb, Ag, Au

Source: Lasley 2018; Trilogy 2018a, 2018b

Note: Ag = silver; Au = gold; Cu = copper; Pb = lead; Zn = zinc. The “mineral resource” column indicates data available, whether “indicated,” “inferred,” or both. Percentages of valuable minerals within the ore vary. All deposits are in the exploration stage, with various amounts of data gathered and made public. In general, most is known about the Arctic deposit and less about the others. These numbers do not indicate a determination has been made that the resources are economically minable or that these numbers represent the maximum extent of the resource that may be minable at each deposit. Exploration continues in the area.

The Arctic Project is 1 of 2 Ambler Metals (formerly Trilogy) projects that constitute the Upper Kobuk Mineral Project. The Arctic Project is located on the east side of Subarctic Creek, approximately 170 miles east of Kotzebue, 22 miles northeast of the village of Kobuk, and 160 miles west of the Dalton Highway. In total, the Arctic Project is approximately 114,500 acres and is the most advanced mining project in the District. An estimated 43 million tonnes of valuable minerals have been identified at the Arctic Mine, including copper, zinc, lead, gold, and silver. The project proposes a single open-pit mine, a conventional grinding mill and-flotation circuit complex with a production rate (mill input rate) of 10,000 tonnes of ore per day over a 12-year anticipated life span (Trilogy 2018a).

The Bornite Project is the other Upper Kobuk Mineral Project and occurs on land owned by NANA Regional Corporation (NANA). The Bornite Project is located approximately 15 miles southwest of the Arctic Project on a 241,000-acre site. It consists of 2 mineralized zones: Ruby Creek and South Reef. Exploration has determined that Ruby Creek resources may be extracted through open-pit mining, while South Reef resources may be extracted using underground mining methods. For purposes of this evaluation and for simplicity, all of the Bornite Project is assumed to be an open pit mining operation because not enough is known about the underground portion and examining the mine as an open pit

¹ In February 2020, Trilogy Metals Inc. and South32 Limited announced the completion of the formation of a 50/50 joint venture company named Ambler Metals LLC (Ambler Metals). Ambler Metals will be working to advance the Upper Kobuk Mineral Projects, including the Arctic and Bornite Projects.

² Tonnes is an industry term for metric tons and is equivalent to 2,204.6 pounds. In comparison, a U.S. ton (also referred to as a short ton) is the equivalent of 2,000 pounds.

provides a more conservative estimate of surface and ground-disturbing impact. The Bornite Project is estimated to contain approximately 182 million tonnes of primarily copper resources (Trilogy 2018b).

The Sun Project is owned by Valhalla and is located approximately 35 miles east of the Arctic Project (Freeman 2018). The Sun deposit is 36,800 acres in size and includes the Main Sun Deposit, S.W. Sun Deposit, and a number of other prospects totaling 230 State of Alaska 160-acre claims. The 11 million tonnes of mineral resources include silver, copper, lead, zinc, and gold. Valhalla is currently conducting exploration activities within the Sun Project (ADNR 2023).

The Smucker Project is owned by Valhalla and is located 25 miles west of the Arctic Project. The property includes 27 State of Alaska claims. Resources include copper, lead, zinc, silver, and gold. Early estimates indicate that the Smucker deposit contains about 11.6 million tonnes of mineral resources in the form of copper, zinc, lead, silver, and gold. The Smucker deposit is still in the early stages of exploration (Cardno 2015).

The Roosevelt Project is owned by South32 and located 20 miles west of Coldfoot and 30 miles north of Bettles. The project consists of over 105,000 hectares of State of Alaska Mineral Claims in a geological belt that may have potential to be similar to the Ambler Mining District and could be host to copper, zinc, lead, and silver mineralization.

The following studies and resources further document the mineral potential of the project area:

- Other studies regarding minerals in the project area include a mineral investigation report for the Koyukuk Mining District (Kurtak et al. 2002), a study of resource potential for critical minerals in Alaska in 2016 (Karl et al. 2016), and a summary report on leasable mineral occurrence and development potential (BLM 2016).
- Outside the District, there is potential for additional mining development to occur along the 3 alternative routes. This would include access to the mining claim clusters near the Zane Hills and Ray Mountains for Alternative C and other locations along all 3 alternative routes, as shown in Volume 4, Maps, Map 2-2. The BLM notes bituminous coal occurrences along Alternatives A and B in the Upper Koyukuk Basin (resource quantity is not available) and sub-bituminous coal occurrences along Alternative C in the Rampart Field (estimated resources: 50 million short tons; BLM 2018b).
- Maps 3 through 8 identify potential for rare earth elements (REEs), placer gold, platinum group elements (PGEs), carbonate-hosted copper, sandstone-hosted uranium, and tin-tungsten-molybdenum deposits, respectively. These areas could also be potentially accessed from the industrial access road for further exploration and development.

2.1.4 Reasonably Foreseeable Mine Development Scenario*

The hypothetical baseline scenario projects an estimated level of activity in the District that would occur under any of the build alternatives. The activities evaluated are typical of those associated with mining in northern Alaska. Table 2-2 provides an estimated timeline for the major steps in exploring and developing a mine. While these time frames are mine-specific and may vary, the time frames provided are included for context and to project a potential schedule for development of the District as it relates to the construction and operation of the proposed road.

Table 2-2. Typical time frames for mine exploration and development

Project phase	Typical time frame	Projected activities
Prospecting and staking	2 years	Geological data and map reviews, airborne geophysics, non-invasive exploration. Completed for the initial 4 projects.
Exploration	2–6 years	Subsurface investigations that include drilling and bulk sampling. This phase can continue for many years and be concurrent with multiple feasibility studies. The time frame shown assumes an aggressive exploration schedule. Exploration has been largely completed for the 4 projects.
Feasibility studies and permitting	6–8 years	Prepare increasingly rigorous feasibility studies, enter into the NEPA process, and obtain permits for mine development.
Development	2–4 years	Development of the mining facility to bring the mine into production.
Production	5–35 years	Mine life spans vary depending on the extent of the deposits and market conditions. The Arctic Project has indicated a minimum life span of 12 years. ^a Production of each mine would vary, but is estimated between 5 and 35 years based on production rates anticipated for the Arctic Project and applied to the total anticipated mineral resource in the District ^b .
Closure and reclamation	2–5 years	Closure of the mine, including removing equipment and some roads, and reclamation of the area.
Long-term monitoring and management	50+ years	Following closure and reclamation, the site is monitored until physical and chemical stability is achieved, and typically includes post-closure water management and treatment. This time frame varies and can be perpetual. The relatively small amounts of fuel, personnel, and supplies needed for the monitoring effort are assumed to be delivered by air during this period.

^a Trilogy 2018a

^b Wood 2019

Method and Assumptions for Hypothetical Development Scenario Projections

The hypothetical development scenario provided in this report is an estimate of the levels of mining-related activities that are anticipated based on current information about the deposits and typical scenarios for mining development of base metal deposits in northern regions of Alaska.

The time frame used for the hypothetical development scenario is approximately 50 years, which correlates to the requested term of the right-of-way (ROW) authorization for the proposed road. This time frame accounts for the time required to construct the main access road and, assuming positive feasibility, bring mining operations online, mine the deposit, and close and reclaim the mines. Given the probable deposit sizes in the District, and realistic mining rates, it is reasonable to expect that the life cycles of the larger deposits fit within the proposed life span of the road.

Additional assumptions to support the hypothetical development scenario are as follows:

- Industry would aggressively explore the District.
- Economic conditions would be strong enough to support development in the District.
- The 4 most advanced projects - Arctic, Bornite, Sun, and Smucker - would be developed and would consist of 4 separate mines.
- Production activities at each deposit would continue year-round for approximately 5 to 35 years, depending on deposit sizes and world markets. Mining activities (exploration, feasibility studies and permitting, development, production, closure, and reclamation) would be staggered as mine development at all 4 projects is unlikely to occur on the same timeline.

- Mine operators would share roads where feasible and as documented in agreements, but other major components mostly would be separate for each mine, such as airports, treatment facilities, storage facility, or maintenance facilities.
- The proposed road would be the primary access to the District and no other major access roads would be required. Access roads would be expected to individual project sites.
- Fuel for equipment operation would be transported to the respective mine sites over the Ambler Access Road.
- All potentially productive areas would be open to mineral entry except those closed by law, regulation, or executive order. Highly prospective lands in Native ownership would be available for lease.

• The road would be constructed in 2 or 3 phases, depending on the selected alternative (see construction phasing description in Chapter 2, Section 2.4.3, Features Common to All Action Alternatives, of the Draft Supplemental EIS). Under the 3-phase alternatives, a pioneer road would be constructed in Phase 1 primarily for winter use, followed immediately by Phase 2, a 1-lane road for year-round use, and a decade later by Phase 3, a 2-lane, year-round road. Under the 2-phase alternative (i.e., the combined phasing option), construction of a pioneer road would not occur, and the road would be constructed to Phase 2 standards from the start. While some aspects of mine development could occur without the road (e.g., air exploration), this hypothetical baseline scenario assumes that mine development would not occur until after the Phase 1 pioneer road construction is constructed (under the 3-phase alternatives) or until after the Phase 2 road is constructed (under the 2-phase alternative).

- The hypothetical baseline scenario mine uses existing active mines of a similar nature in Alaska. All disturbance estimates would be increased or decreased by different terrain, deposit size, ore grade, mine development requirements, and energy and transportation requirements.
- The analysis is based on publicly available information.
- Long-term monitoring of the mines would not require road access via the road. Monitoring would continue beyond the life span of the road. The relatively small amounts of fuel, personnel, and supplies needed for the monitoring effort are assumed to be delivered by air.

Hypothetical Baseline Scenario

Prospecting and Staking

Prospecting is the first step in mine development. Geological data and maps are reviewed to identify areas that have the potential to contain mineral resources. On government land, once an area is identified, a company stakes rights to mine in a specific location (also referred to as a mineral location claim). Typically, these first 2 steps do not involve subsurface investigations. Four major mineral deposits within the District have been prospected and staked: Arctic, Bornite, Sun, and Smucker, which are shown in Map 2. The ownership of these deposits includes (Cardno 2015):

- The Arctic Project is owned by Ambler Metals (formerly Trilogy). The Arctic Project consists of 1,358 contiguous state and federal patented claims located on approximately 112,000 acres.
- The Bornite Project occurs on land owned by NANA. The Bornite Project is located on a 241,000-acre site.
- The Sun Project is owned by Valhalla. The Sun deposit is 36,800 acres in size and a total of 230 State of Alaska 160-acre claims.

- The Smucker Project is owned by Valhalla. The project includes 27 State of Alaska claims.

While these 4 major mineral deposits within the District were determined to be reasonably foreseeable to be developed into mines with implementation of the proposed road, there are other mineral deposits that were not considered reasonably foreseeable because their development was more speculative. Sunshine is one such polymetallic deposit that contains copper, zinc, lead, and silver. While other deposits may not yield the quantities estimated in the 4 existing projects, they could become potential satellite mines as the full extent of the District is explored and developed (NovaCopper Inc. 2012). Further exploration is needed to determine the extent and economic viability of developing these additional areas. Because development of these additional areas is highly speculative, they are not included in the detailed development scenario in this EIS and cumulative impacts from such development are assessed only in broad terms.

Exploration

Once an area has been prospected (using sediment sampling, airborne geophysics, or outcrop analysis), the owner of the staked claims begins exploration of the area. This is primarily subsurface exploration using drilling and sampling to confirm the presence of a deposit and determine its size, shape, characteristics, and mineral grade. Due to the expense, trenching and drilling is generally limited to the area needed to sufficiently identify the deposit to support the costs of development. After sufficient drilling and trenching has been completed, the owner of the claim completes a delineation of the anticipated extent of the ore deposit within the claim and prepares a preliminary economic assessment (PEA) for development. While an ore body may be present, if it does not appear to be of sufficient quantity and quality, it does not make sense to develop the mine. If the PEA shows promising economics, the owner of the claim will enter into the Feasibility Studies and Permitting process.

Feasibility Studies and Permitting

Prior to mine development, each proposed mine prepares a Feasibility Study. Typically, a Pre-feasibility Study (PFS) is completed first, followed by a Final Feasibility Study (FFS) for large-scale projects. The Feasibility Study defines the extent and type of mining to be conducted, including construction, operation, and reclamation, as well as the capital and operating costs. These studies are often used to assist in establishing financing for mine development.

In addition, easements for access and use of the land, or permits and approvals from a federal entity (e.g., Clean Water Act Section 404 permit), will require preparation of an accompanying NEPA document. The NEPA document provides an assessment of the existing conditions and resources at the proposed mining facility and the potential effects to those resources. Mitigation measures to avoid or minimize those effects are included and a description of the proposed reclamation post-operation is provided. These documents are evaluated by the agency(ies) prior to approval for the mining operation, and include agency and public outreach.

In addition, the mine must receive all necessary approvals and permits from the various resource agencies before mine construction may begin. Moreover, prior to any proposed mining action, the company would be required to provide Financial Assurance to the State for the Reclamation and Closure of the mine. While AIDEA has indicated that the Ambler Road construction would not begin until sufficient lease agreements had been signed between AIDEA and mining companies to pay for the road, the road could be completed in advance of other mines having their own approvals.

Of the 4 most advanced projects in the District, only the Arctic Project has developed a PFS, published by Trilogy in 2018. The PFS provides information on the development of the mine that has been incorporated into this hypothetical development scenario. Other representative mines (e.g., Kensington,

Red Dog, Pogo) in operation in Alaska are typical of the size and methods that would be expected in the District for the 4 known projects and have also been used in development of the hypothetical baseline development scenario. While the following sections provide a qualitative description of mine development and closure and reclamation (Section 2.1.4, Reasonably Foreseeable Mine Development Scenario), quantitative information from typical mines can be found in the Kensington Gold Project Final Supplemental EIS (USFS 2004), Pogo Gold Mine Final EIS (EPA 2003), Red Dog Mine Extension Aqqaluk Project Final Supplemental EIS (EPA 2009), and *Kobuk-Seward Peninsula Resource Management Plan* (BLM 2005). Information from these documents is incorporated by reference into this appendix.

Development

Development of each mine assumes that the proposed road would be completed. Accessory roads from the main access would also be constructed. After completion of the road, additional equipment and supplies and workforce necessary to fully develop the mine could be more efficiently transported. The District would likely develop using 2 mining methods: open pit and underground mining. Open pit is the most likely method to be used in the District, but the Bornite Project has indicated the use of underground mining methods for the South Reef site.

Open Pit Mining

Open pit mining is a typical surface mining technique of extracting rock and ore from the surface, resulting in an open pit. This style of mining is best for ore found near the surface, where the overburden is relatively thin or the use of tunnels may be structurally unsafe. Arctic Project preliminary designs provide a typical example of the layout of an open pit mine, as shown in Figure 2-1 and Figure 2-2. The mine is slowly enlarged until the ore is exhausted or it is no longer economically feasible to mine the deposit. The layout of an open pit mine includes construction of bench areas set at 4- to 60-meter intervals that are used in the removal of ore and waste rock. The walls of an open pit mine are angled to aid in stabilization of the soils and minimize rock falls. A haul road is also constructed along the side of the pit to form a gradual ramp for equipment and trucks to enter and exit the mine.

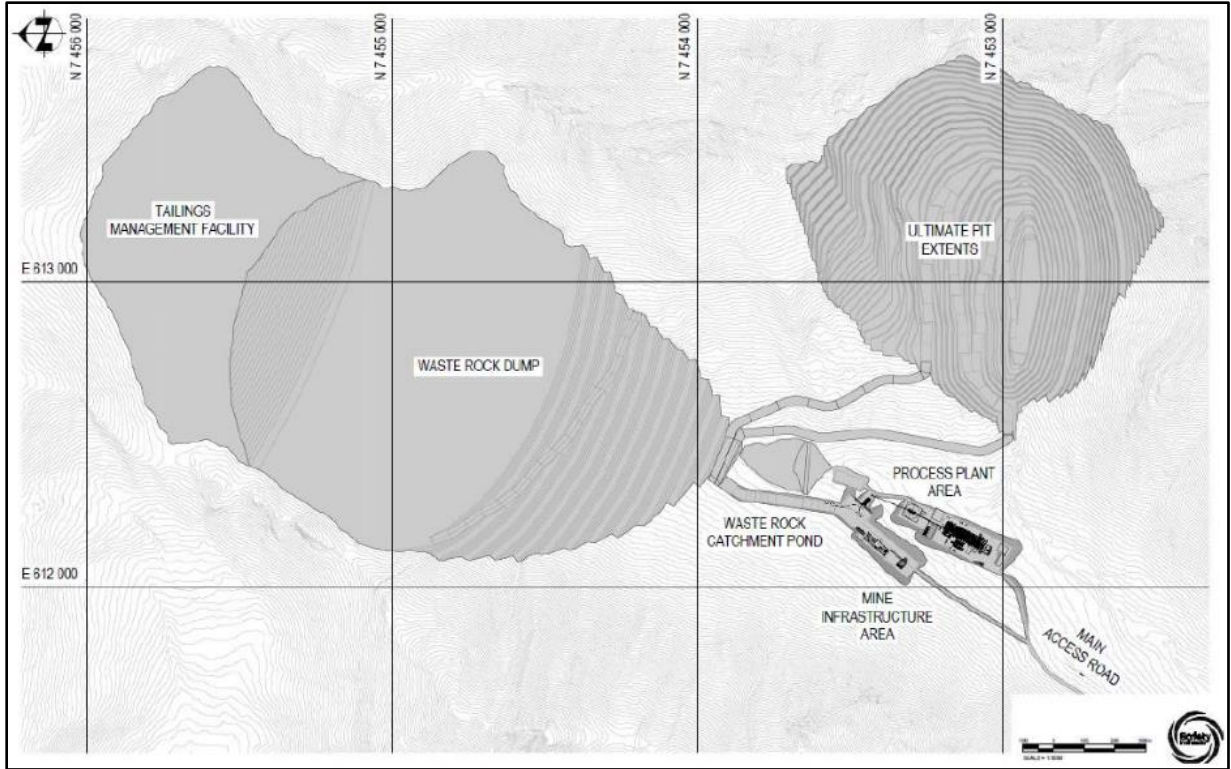


Figure 2-1. Arctic Project proposed mine layout

Source: Trilogy 2018a; adapted from Figure 18-2: proposed site layout

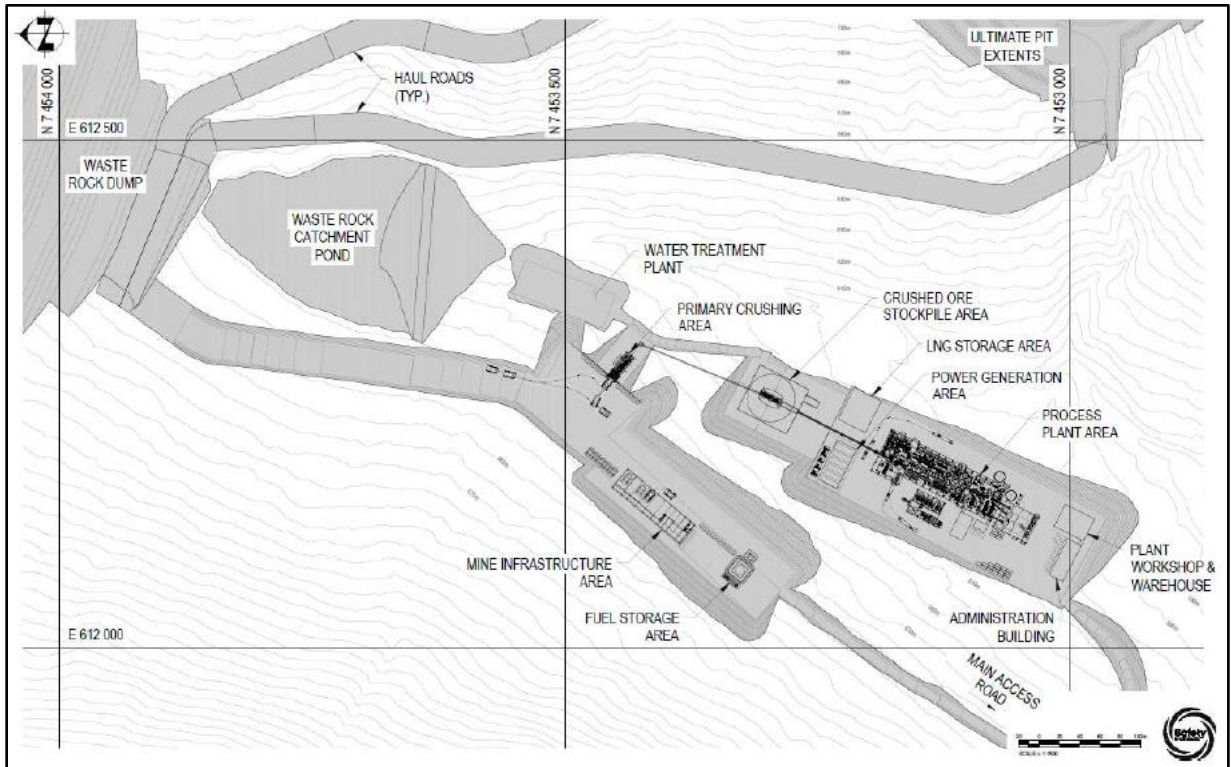


Figure 2-2. Arctic Project proposed ore processing facility

Source: Trilogy 2018a; adapted from Figure 18-1: proposed location of the processing plant and other buildings

Underground Mining

Underground mining consists of digging tunnels and shafts to access ore deposits. A typical example of the layout of an underground mine would be similar to the open pit scenario, but instead of an open pit there is an underground ore body. Underground mining is typically done for ore that is located deeper, with a thick overburden, and the surrounding rock is considered “hard rock” that is structurally sound enough for tunnels and shafts. The ore and waste rock are extracted and brought to the surface for processing. The tunnels and shafts are slanted to allow for equipment access and extraction and are typically sized to accommodate a 40-ton haul truck (approximately 11 feet wide and 12 feet high). Workers may also use the tunnels and shafts, but an elevator may be installed to provide access to deeper parts of the mine. A key to safety is ventilation shafts to allow contaminated air to escape and fresh air to be drawn in. These can also be used in cases of emergency as ingress and egress points.

Production

The production phase is the time frame during which the ore is extracted from the mine and processed to produce a mineral concentrate for shipment and sale. The processing rate would vary by mine, but could range from 10,000 to 15,000 tonnes of ore per day. The Arctic Project is expected to have a production rate of 10,000 tonnes of ore per day (Trilogy 2018a). The anticipated mineral resource in the District is about 248 million tonnes of ore (Cardno 2015; Trilogy 2018a) comprised of copper, zinc, lead, silver, and gold. Production of each mine would vary and the actual amounts of ore processed could differ from the totals shown in Table 2-1, but is estimated between 5 and 35 years based on production rates anticipated for the Arctic Project and applied across the District (Wood 2019), and based on AIDEA’s request for a 50-year term for the road ROW authorization. The Arctic Project has indicated a minimum life span of 12 years (Trilogy 2018a). The Red Dog Mine, north of the District, began operations in 1989 and is expected to continue production through 2031 (43 years; Teck 2018).

Blasting

Blasting is necessary to efficiently break rock in the mine to manageable sizes for hauling to the mill. It is typically done using explosives comprised of a mixture of ammonium nitrate, fuel oil, and emulsion blasting agents. A plan is developed to identify appropriate locations for blasting that will yield the highest returns. This is based largely on the geology of the rock and whether it is a hard rock type such as granite or a soft rock such as sandstone. Once the locations are evaluated and marked in the field, a drill is used to create a hole for placement of the explosive and fuse. Blasting is conducted following mine safety and health regulations.

Overburden and Waste Rock Disposal

Overburden and topsoil are the uppermost layers removed before the ore is encountered. Open pit mines generally generate more overburden and topsoil removal than underground mines. These materials could potentially be used during mine closure and reclamation. As such, they are generally stockpiled separately from waste rock.

Waste rock is the material removed to expose the ore body prior to mining and may have an ore content that is not economically recoverable. For underground mines, the waste rock is hauled to the surface for storage, use, or disposal. If the waste rock is suitable, it may be reused to create foundations, drainage, or embankment material at the mine site. During mine reclamation or during the backfill process in underground mining, the waste rock may be used as part of the backfill process. Waste rock that is reusable is stockpiled in designated areas. For open pit mining, waste rock stockpile areas are likely adjacent to the pit. Any soils encountered that are suitable for plant growth are separated and stockpiled

for later use as a growth medium during reclamation. During mine reclamation, the waste rock stockpiles are likely regraded to a 3 to 1 slope, covered with growing medium, and seeded.

Unsuitable waste rock is taken to a nearby permanent disposal site. To the extent practical, stockpile and disposal sites are located away from streams, wetlands, or other sensitive areas. Rock in the District likely will include some that could produce acid rock drainage. Any waste rock determined to contain acid rock or other hazardous material is stored separately in appropriate containment to prevent contact with workers or the surrounding environment. Permanent disposal of the potentially hazardous waste rock, and treatment of drainage discharges from such rock, must meet all permit requirements.

Equipment

Most mining equipment is diesel-powered and consists of large and small equipment, depending on the task. Technological advancements are being made that allow for the potential use of liquefied natural gas (LNG)-powered haul trucks. As the bottom of the open mining pit is lowered or an underground mine is deepened, additional equipment is required to reflect increased overburden stripping volumes and longer cycle times for removal of materials. Each mine includes a service shop for equipment maintenance. Each piece of equipment is maintained routinely to ensure high performance and minimize equipment failures that could result in safety or environmental risks (e.g., spills). Mobile equipment is serviced at the service shop, while track-bound equipment (i.e., shovels, excavators, drills, dozers) is serviced in the field using spill prevention measures. Auxiliary equipment to support mine maintenance and mine operation is required over life of the mine. This equipment generally includes cranes, forklifts, service trucks, pickup trucks, crew buses, and similar equipment.

Table 2-3 shows the typical equipment expected at each mine required for mine production, regardless of whether it is open pit or underground. Aircraft for transportation for non-production or maintenance activities, such the transport of people, goods, or equipment to and from the mine from nearby towns, are not included.

While equipment needs are similar, the specific model of equipment would differ slightly to accommodate the environment of an open pit versus underground mine. For example, with space more available in an open pit scenario, a larger and taller wheel loader could be used for open pit mining. This larger loader would not be practical in the confined space of an underground mine. A compact loader capable of navigating smaller spaces that is shorter and narrower would be used for underground mining. The Arctic Project PFS includes a list of anticipated equipment (including specific models) and quantities for the proposed open pit mining operation. Specifications are included in Table 2-3.

Table 2-3. Estimated equipment to be used at each mine for production purposes

Equipment Unit	Use	Arctic Project PFS proposed equipment
Drill	Drill rigs that are used to drill blast holes.	178 mm/45 klb Production Drill 5 inch Top Head Hammer Track Drill
Shovel	Used to load blasted waste rock or stripping rock into the haul trucks.	300 t/17 m ³ Hydraulic Face Shovel
Loader	Mobile shovels that can be deployed for specific waste stripping.	125 t/12 m ³ Front End Loader
Excavator	Primary method for loading blasted ore rock into haul trucks.	30 t/12 m ³ Hydraulic Excavator 68 t/4 m ³ Hydraulic Excavator 35 t m ³ Hydraulic Excavator

Equipment Unit	Use	Arctic Project PFS proposed equipment
Haul trucks	Transport the ore and waste rock within the mine facility; larger trucks are used for waste stripper and smaller truck for mining the ore.	131 t Haul Truck 91 t Haul Truck 40 t Articulated Truck
Track and wheel dozers	Maintain pit floors, dumps, and stockpile areas, and build roads.	70 t/430 kW Track Dozer 50 t/370 kW Rubber Tired Dozer
Graders	Haul road maintenance.	27 t/221 kW Motor Grader
Water trucks	Spray a layer of water to suppress dust, especially on haul roads and for watering the drills and for fire patrol.	34,000 L Water Truck
Fuel / Lube trucks	Provide fuel and lube supplies to primarily shovel and other tracked field equipment.	40 t Articulated Fuel/Lube Truck
Sand truck	Used primarily in winter to provide traction to roads or high-use areas.	40 t Articulated Sand Truck
Snow plow	Clearing of snow for access.	Equipment type not listed in PFS
Explosive trucks	Used to deliver a bulk emulsion product down the borehole for blasting.	2 MMU bulk explosive trucks

Source: Trilogy 2018a

Note: klb = thousand pounds; kW = kilowatt; L = liter; m³ = cubic meter; mm = millimeter; MMU = mobile manufacturing unit; PFS = Pre-feasibility Study; t = ton

Ore Processing

Ore processing is the method by which target minerals are separated from surrounding material. Figure 2-3 illustrates the typical steps in the process and is not specific to a particular ore. Processing differs for each ore, but in general includes crushing, grinding, flotation, thickening, and filtration. Each mine could have a separate processing facility located near the open pit or ore shaft to minimize transportation costs. It is possible that a mine, especially a satellite mine, would use the processing facility of another for similar ore content. For purposes of the hypothetical scenario, it is assumed that each of the Arctic and Bornite projects would have its own processing facility and that the Sun and Smucker projects would use those facilities as appropriate.

Ore from the mine is hauled to a primary crushing plant to reduce the maximum particle size to approximately 6 inches. The crushed material is conveyed using either a haul truck or conveyor belt to a stockpile before being ground in the grinding plant. The grinding plant uses semi-autogenous grinding mills and ball mills to further reduce the particle size to the consistency of facial powder. As the material is ground, it is typically directed to a hydrocyclone that separates the oversize material from fine material. Oversize material is rerouted through the grinding process until it reaches the proper size range.

Once the grinding process is complete, the fine material is fed into a flotation process. The flotation process differs slightly for each ore; however, the purpose is to separate the ore minerals, such as copper, from the barren material using a water slurry treated with specific chemicals that separates out the desired ore hydrophylically. Once separated, the ore floats to the top of the slurry and is easily skimmed off and collected. The mineral concentrate then flows through additional flotation tanks to further remove impurities and increase the mineral grade of the concentrate. The flotation process is designed to keep most of the chemicals used in the process within the flotation tanks or remove them with the flotation concentrate. The chemicals added during flotation will be in process water, concentrate, and tailings. As an example, the Arctic Project anticipates that the flotation process would include a talc pre-float followed by a bulk copper-lead flotation and zinc flotation, followed by a separation of the copper and lead. Most of the metals would likely be copper and lead concentrates (Trilogy 2018a).

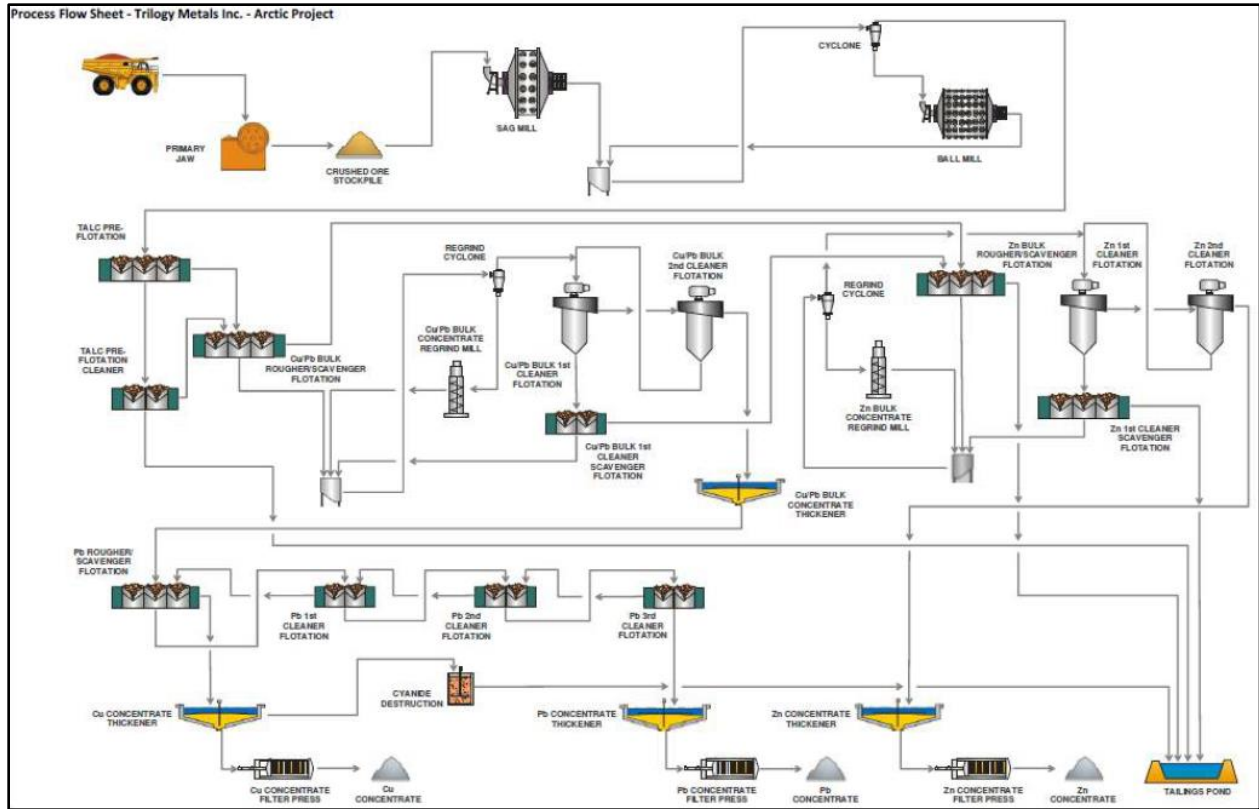


Figure 2-3. Ore processing steps for the Arctic Project mine

Source: Trilogy 2018a; adapted from Figure 17-1; simplified process flowchart.

Once the concentrated ore has finished the flotation process, it is dewatered and placed in specialized, sealed transport containers for shipment to an existing, off-site processing facility. The containers used are approved for use in trucks, rail, or ship, depending on the transport type and final destination.

Tailings Disposal

Tailings are the material that remains after the concentrated ore has been removed from the flotation process. Tailings are generally thickened with additives to create a slurry that allows solids to settle easily. Once solids are separated, the tailings can be moved to a disposal area or reused as backfill material during mine closure.

Tailings are used to backfill areas of an underground mine once all the ore in a specific section has been removed. Typically, the tailings are mixed with a cement-like mixture to create a paste that can be easily placed inside the mine via a pipeline. The pipe includes secondary containment in the event of a pipeline failure. Backfilling of the mine provides additional stability and increased safety for continued mining activities and following reclamation. Similarly, the tailings can be used in backfilling the open pit mine during reclamation.

For tailings that are not reused, the slurry is moved through a pipeline, with a casing for spill containment, to a tailings management facility (TMF). The TMF design is location- and mine-specific, and many factors are evaluated to determine the appropriate facility design. These include geotechnical information to determine the stability of a given location, proximity to the processing facility and pit, area available to develop the TMF, costs, and environmental concerns.

Using the Red Dog Mine and Arctic Project PFS as examples, the TMF likely would include a lake behind an earthen dam, designed and constructed in accordance with applicable regulations. However, there are other forms for the TMF, such as paste tailings and dry stack that are used at the Pogo Mine (EPA 2003) and Greens Creek Mine (USFS 2003), respectively. The dam can be constructed in part using waste rock generated from the mining process. In simple terms, the slurry is pumped into the containment area behind the dam to allow solids and water to separate. The solids settle to the bottom, which allows the water on top to be reclaimed as processing water at the mill. The dam height is often raised over the life of the mine to provide more capacity in the TMF. Designs often include diversion channels to keep surface water runoff from entering the TMF. During the reclamation process, the amount of water behind the dam is reduced to the extent practicable, but the TMF remains in place for the long term. Water from behind the dam and mined areas is likely to be considered acid rock drainage, based on the geology of the area (see Chapter 3, Affected Environment and Environmental Consequences, Section 3.2.1, Geology and Soils, of the Draft Supplemental EIS), and is likely to need treatment during and after the life of the mining operation.

Mine Water Management

Mining activities encounter water, whether in the mine itself, from intersecting groundwater, or from stormwater and meltwater runoff. Water is generally classified as mine drainage, contact surface water, non-contact surface water, or process water. Mine waters are handled differently depending on whether they are non-contact or contact waters:

- Mine drainage includes surface water and groundwater encountered during excavation and mining activities that outflow from the mine. Mine drainage has interacted with the exposed mineralized rock wall surfaces in the mine and as a result may contain pollutants. Mine drainage is typically captured and either used in the mineral processing or directed to a water treatment facility. At the facility, it is filtered and then treated to remove pollutants to meet surface water discharge permit limits. Proposed surface water mine drainage discharge would be regulated under an Alaska Pollutant Discharge Elimination System Permit managed by the Alaska Department of Environmental Conservation (ADEC). Any proposed groundwater mine drainage or mine drainage not discharging to surface water would be regulated under a Waste Management Permit (Alaska Statute [AS] 46.03 and 18 Alaska Administrative Code [AAC] 15, 60, 70, and 72) managed by the ADEC.
- Non-contact water is stormwater and meltwater that does not come into contact with the mining operations. This water is collected separately and allowed to settle sediments before being discharged back into a stream or infiltrate to groundwater.
- Contact water is stormwater and meltwater runoff that comes in contact with the mining operations, such as waste rock or tailings, and as a result may contain pollutants. Contact water is minimized through best management practices, including runoff controls. Contact water is typically captured and directed to a water treatment facility where sediments are settled out of the water, and it is filtered and then treated to remove pollutants to meet discharge permit limits.
- Process water is the water used and generated during the ore processing at the mill. While the water is derived from either a groundwater or surface water source originally, once the mill is operational, the water in the TMF is reclaimed, treated, and used as process water to minimize the overall water needs for the mine. Prior to being reused in the facility, the process water is collected and treated to remove sediments and pollutants to meet discharge permit limits. In its role as a cooperating agency, the U.S. Environmental Protection Agency (EPA) indicated that some volume of process water may be discharged if it is commingled (stored) with an allowable

source like mine drainage or net precipitation. Then, only the volume of the allowable source may be discharged.

An important impact of a mining operation is the drawdown of the water table, using pumps, in order to access ore at depth. Such water typically would be treated as non-contact water. If it was determined to be contact water, it would be further treated, as described above. This drawdown of water results in a large cone of depression in the groundwater table, which can lower the water table well below natural stream or lake levels and substantially reduce flow into streams. The effects of water drawdown on fish and amphibians are described in Chapter 3, Affected Environment and Environmental Consequences, Section 3.3.2, Fish and Aquatics, of the Draft Supplemental EIS. Mine-induced alterations to the exchange patterns of surface and groundwater also has the potential to create additional pathways for dispersal of potential contaminants.

Sanitary Wastewater

Each mine would maintain a permitted sanitary wastewater treatment plant near the facility to handle sanitary wastewater. Further evaluation is necessary to determine if a septic system would be feasible. Septic systems collect sanitary wastewater in a central septic system that discharges to a leach field. If the groundwater table is too high, it may not be feasible to discharge to a leach field. Treated wastewater would then be discharged into either the tailings impoundment or another permitted alternative.

Water Supply

Each mine requires fresh water for domestic use and ore processing. Water needs would vary by the size of the mining operations. To meet the necessary water demands in the District, each mine would be required to obtain water rights to access groundwater and/or surface waters to meet water supply needs. The Red Dog Mine Final EIS and Arctic Project PFS provide representative examples of the water supply needs anticipated for the District (EPA 2009; Trilogy 2018a).

Each mine would treat the water to remove any pollutants prior to use. During construction, before the permanent water supply and treatment facility were operational, water would be treated through a portable treatment plant prior to use. As described in Mine Water Management, treatment would meet permit requirements for discharge and use.

Power Supply and Fuel Use

Each mine would have differing power requirements, but is expected to include either LNG or diesel generators to provide power to the process area, with underground lines used to supply power from the process area to other areas of the mine. A selective catalytic reduction system or similar best available technology would be included in the design for the diesel generators, as required by the ADEC air quality permit. The power supplies would be operated and emission sources controlled according to ADEC's air quality permit requirements.

Each mine would provide on-site storage for diesel, LNG, and gasoline, with secondary containment. Best management practices typically would include concrete-lined, bermed areas, or double-walled tanks for storage. Diesel would be the primary fuel used on site for vehicles, equipment, and power generators. Gasoline would be used for small engine equipment. Certain vehicles and overall power generation for the facility would use LNG. Each mine would prepare a Spill Prevention Control and Countermeasures plan for specific operations. An estimate of power needs was projected for the Arctic Project and provides a quantitative analysis of the potential power needs (Trilogy 2018a).

Reclamation and Closure

Reclamation and closure occur once the mine is no longer producing ore. Typically, the process to formally reclaim and close a mine site takes 2 to 5 years following the termination of production. Reclamation may also take place concurrently with ongoing mining as areas are mined out or if mining waste stockpile storage areas are full and ready to be reclaimed and closed. Reclamation also applies to activities that are undertaken on an interim basis. Interim reclamation would be done to reduce erosion potential by stabilizing road cuts and stockpiles, and other disturbances resulting from exploration, as well as construction and operation of the mine facility. Interim reclamation typically involves the use of seeding and mulching. Reclamation and closure of each mine would need to meet the State of Alaska's requirements for reclamation established under AS 27.19 and 11 AAC 97. This includes a requirement for financial assurance that the reclamation will be completed. Reclamation and closure plans, if approved by the state, are reviewed at a minimum of every 5 years.

The overall closure objective is to establish stable chemical and physical conditions at the mine site. Reclamation usually entails the following activities:

- For an underground mine, the mine facility would be backfilled to stabilize the soils within the mine to prevent erosion or collapses. Fencing and signage would be placed to deter trespassers and limit wildlife access to the area for safety.
- For an open pit mine, the pit walls and backfill would be stabilized as appropriate. As proposed for the Arctic Project, water would be allowed into the pit to create a "pit lake." Water from the pit lake would be treated and discharged to meet permit requirements. An emergency spillway would be constructed in the event of an overflow. Fencing and signs would be placed to deter trespassers and limit wildlife access to the area for safety.
- All waste rock dumps would be regraded to stabilize the slopes, covered with an engineered soil cover, and seeded. Waste rock runoff would also be routed to the pit lake for treatment.
- Tailings impoundments may be closed by such means as maintaining a shallow water cover, dewatering, and covering with an engineered cover. Runoff water or seepage would be collected and routed to the pit lake for treatment and discharge.
- Buildings and equipment would be dismantled and removed. It is possible that concrete foundations would remain in place and be covered, such as is proposed for the Arctic Project (Trilogy 2018a). Rock pads for building structures and equipment would be regraded.
- Access roads, hauls roads, and rock fill pads would be removed, regraded, and reseeded to restore these areas.
- A landfill for non-hazardous materials would likely be placed in the area used for the waste rock disposal. Materials from the closure and reclamation process would be placed in this landfill. The landfill would then be graded and reseeded to restore the area.
- If not economical to remove or sell at closure, mobile or stationary equipment would be stripped of electronics and batteries, and fluids drained and placed in an approved landfill for final disposal.
- Hazardous waste materials would hauled to a licensed disposal facility in a sealed container, while non-hazardous waste would be placed in the landfill.

Structures required for long-term monitoring, as described in the next section, would not be removed during the closure and reclamation process.

Long-Term Monitoring and Management

Long-term monitoring, and associated management and treatment of water, soils, and vegetation, is required to maintain water quality and determine whether reclamation goals are met. Long-term monitoring varies, but could extend 50 or more years beyond the life of the mine and could be perpetual. Long-term financial assurance for conducting the long-term monitoring would be established by each mine for the monitoring activities.

As described in the Arctic Project PFS (Trilogy 2018a), shorter duration post-reclamation monitoring could occur for up to 10 years and include:

- Visual inspection for soil stability annually for 3 consecutive years and less frequently thereafter for up to 10 years.
- Annual inspection of the soil covers over the waste rock dump and TMF to ensure that the physical integrity of the cover is maintained.
- Inspection roughly every 3 years to confirm suitability of the revegetation efforts.

Water quality monitoring and water management is the longest of the post-reclamation requirements. This monitoring and management could be required in perpetuity, and frequency and duration will be determined during the permit process.

With the need to conduct long-term monitoring, the water treatment facility and ancillary power generation for it would remain. An access road to the facility would also remain for inspection and maintenance of the facility. Seasonal housing and required power generators for housing would be established using materials already on site, as practicable. It is assumed that the Ambler Road would no longer be required and that access to the mines for water treatment and long-term monitoring would occur by air, with some delivery by barge if needed. The local road system between Kobuk/Dahl Creek Airstrip and the mines are assumed to remain. It is possible the mining companies would request that portions of the Ambler Road within the District that provide direct access to the mines (e.g., toward Sun and/or Smucker mines) be retained under mining company control and not closed and reclaimed when AIDEA closes the rest of the road.

Employee Housing and Crew Shifts

Employee housing for each mine would be provided at a camp that is self-contained with its own power supply, water treatment plant, sanitary treatment facility, and garbage disposal at a landfill. Each mine could have up to 3 different camps for exploration, construction, and operation.

Exploration camps are generally smaller and are used to house employees during exploration of the deposit. These camps are often located closer to a nearby road or access point for easier transport of employees, goods, and equipment. These camps can also be used during the construction phase.

A temporary work camp would be created during construction near an access point similar to that described for the exploration camp. The construction camps proposed for the Arctic Project use both the Bornite Exploration Camp (houses 70 people) and a separate work camp (houses 200 people; Trilogy 2018a). After construction, the temporary work camps would likely be removed. Construction crews would typically work 6 weeks on and 2 weeks off.

For operations, a permanent work camp would be established closer to the mine and processing facility. The permanent camp would likely be constructed as soon as access allowed so that it could be used as a construction camp as well. The Arctic Project anticipates that the permanent work camp would house 450 people and is sized to accommodate the peak accommodation requirements during construction (Trilogy

2018a). Once the mine became operational, workers would rotate on a 2-week-on, 1-week-off schedule. On rotation day, workers would be bussed to the local airstrip for flights to either local villages or Fairbanks. The Arctic Project has projected that, during operations, there would be 3 rotating crews working 12-hour shifts. The crews would overlap between shifts to maintain optimal operations of the mine. The daylight shift would include more staff than the night shift as most operations at the mine, including general maintenance and blasting, would take place during daylight hours (Trilogy 2018a).

Transportation

Employees, supplies, and equipment require different transportation methods depending on the stage of development. Exploration is currently underway at the 4 projects in the District. During the exploration phase, access from a major city for the transport of supplies, equipment, and people is via nearby airstrips. Except for Bornite, roads from the airstrip to the other deposits are not available, so transport of employees and equipment are delivered to the sites via helicopter or along dirt trails during summer and ice roads during winter. As construction of each mine progresses, equipment and supplies would be transported primarily using the proposed road; however, the transport of employees to and from Fairbanks (the likely transportation hub for employees departing from and arriving at the general region) to each of the project sites would continue via airplane, as it is likely the most economical means of transporting people. Employees from local villages would either take scheduled flights to the Fairbanks hub to get to work or possibly would be picked up by a mining company flight.

Once the proposed road is constructed, continuing exploration activities would use the road. Traffic associated with initial activities would likely be to 10 to 15 trucks per week from May 1 to October 15. After the road is constructed, access roads to work camps, airstrips, and the overall mining facilities would be constructed, but transport of employees would still primarily occur using the airstrips. Closure and reclamation would remove the majority of infrastructure from the District, but established airstrips and some local roads could remain to provide access to each mine for long-term monitoring.

Air Transport

The Bornite Project currently uses the state-owned airstrip at Dahl Creek and a smaller airstrip near the deposit (Trilogy 2018b). These would likely continue to be used during development and production phases of the project. The Arctic Project is anticipating using the Dahl Creek airstrip, as the proposed mining operation location is topographically unsuitable for an airstrip. While the Dahl Creek airstrip currently supports exploration efforts, it would require upgrades in order to support the use of Dash 8 aircraft or an equivalent aircraft for transporting mine crews, equipment, and supplies during construction and operation. Anticipated upgrades include lengthening the runway and adding a lighting system and an automated weather observation system (Trilogy 2018a). The Dahl Creek airstrip is connected via the Dahl Creek Road to Kobuk, which has its own state airport. The road connects Kobuk, the Bornite deposit, and the established airstrip at the deposit.

The Smucker and Sun projects would also use their own airstrips. The Smucker Project is located near the western edge of the District, and no existing airstrips are present near the deposit. The Sun Project is located in the eastern part of the District and has its own airstrip, although it may require updates to accommodate construction and operation activities.

Projected flights to and from the 4 mining projects have not been published. Using the weekly fixed-wing schedule for the Red Dog Mine published in the Final Supplemental EIS (EPA 2009), an approximation of the weekly flights relative to the expected direct employment numbers during operation of each of the 4 mining projects is estimated in Table 2-4. Included in the flights is 1 weekly flight to deliver or pick up

freight and materials, and 3 additional flights for employees or visitors that are not specific to a crew change. Flights for construction activities for mine development would be similar to those for operation.

Table 2-4. Estimated weekly fixed-wing flights for the 4 mining projects

Project	Direct jobs during operation	Number of weekly fixed-wing flights for freight deliveries or other transport	Number of weekly fixed-wing flights for crew changes	Total number of weekly fixed-wing flights
Arctic	217	4	4–5	8–9
Bornite	157	4	3–4	7–8
Sun	66	4	1–2	5–6
Smucker	55	4	1–2	5–6

Source: HDR 2019a; UA 2019

Transport of Concentrate

Once ore is processed and ore concentrate packaged, the concentrate would be transported along the access road and ultimately to a port for export. With the 3 access road alternatives, the selected transportation corridor from the District would connect to the surface transportation system in Alaska’s Interior: the Dalton Highway. Generally speaking, the logistics train that would serve to supply the District begins with transport from marshalling yards in Canada or on the west coast of the United States by container barge to tidewater ports in Alaska such as Seward, Whittier, Anchorage, or Port MacKenzie. From there, the containers would be transferred to rail and hauled to Fairbanks, transferred again to truck trailer, and then hauled along the Dalton Highway and Ambler Access Road to the mine site. Currently, the use of a pipeline to transport processed ore or provide fuel is not anticipated and not considered in the hypothetical baseline scenario. Mineral concentrates would be loaded into specialized (sealed) intermodal bulk shipping containers, trucked to Fairbanks, hauled by rail to tidewater ports in Southcentral Alaska (such as Seward, Whittier, Anchorage, or Port MacKenzie), and then unloaded into bulk carrier vessels for ocean transport to the smelter. With this containerized system, which is not used at Red Dog Mine, metal releases from the transport of ore concentrate would not be expected if the container systems were well maintained.

Truck Transport and Vehicular Traffic. The Arctic Project has projected production input of 10,000 tonnes per day of raw ore. Output is estimated as 550,000 short wet tons of concentrate per year, or 1,507 short wet tons³ per day. AIDEA has noted that each truck would transport 2 trailers (doubles), each trailer carrying an ore container with a 30-tonne capacity (33 short wet tons) along the proposed road. For the Dalton Highway, the trucks would transition to 1 trailer with 1 container. A staging area is assumed at the eastern end of the Ambler Road for staging and reassembling trailers. With up to 4 mines operating around the clock, the staging area would be expected to have continual activity (e.g., moving trucks, trucks idling, backup bells). One or more similar staging areas would occur at the mine end of the road. Projecting the same technique described above to other mines, and adding ancillary traffic—from fuel deliveries to road security patrols to commercial deliveries for communities—Table 2-5 provides approximate total traffic levels on the proposed road and public highways farther south. The estimate includes traffic related to mining in the District, operations and maintenance of the road and its associated communications system, and deliveries to communities. It does not include road construction or reclamation equipment or associated construction traffic, potential trips associated with emergencies or

³ A short wet ton is equivalent to a short ton (2,000 pounds) but refers to the weight of materials that are still “wet,” in slurry or paste form.

fighting of wildfires, or potential agency/land manager trips. Table 2-5 estimates the number of trucks anticipated for transport of the mineral ore from the 4 mining projects to Fairbanks.

Projecting the same technique described above to other mines, and adding ancillary traffic—from fuel deliveries to road security patrols to commercial deliveries for communities—Table 2-5 provides approximate total traffic levels on the proposed road and public highways farther south. The estimate includes traffic related to mining in the District, operations and maintenance of the road and its associated communications system, and deliveries to communities. It does not include road construction or reclamation equipment or associated construction traffic, potential trips associated with emergencies or fighting of wildfires, or potential agency/land manager trips.

Table 2-5. Mine characteristics and resulting traffic generated by the 4 mining projects during production

Item	Arctic	Bornite	Sun	Smucker
2018 resource (tonnes)	43 million	182 million	11 million	11.6 million
Product recovered in concentrate	Cu, Zn, Pb, Ag, Au	Cu, Co	Cu, Zn, Pb, Ag, Au	Cu, Zn, Pb, Ag, Au
Mill throughput (tonnes/day)	10,000	14,250	5,000	5,000
Production rate (short wet tons/day)	1,507	784	548	548
Mine life (years)	12	35	6	5
Annual/daily concentrate production (short wet tons)	550,000/1,507	286,000/784	200,000/548	200,000/548
Ore concentrate containers filled per day for transport	46	24	16	16
Daily double-trailer trips: Ambler Road (total of full outbound and empty return)	46	24	16	16
Daily single-trailer trips: Dalton Highway (total of full outbound and empty return)	92	48	32	32
Annual mill and maintenance supplies (short tons)	11,000	9,000	6,000	6,000
Mill and maintenance daily trips	2	2	2	2
Daily fuel and other supply trips	12	12	6	6
Daily incidental trips	2	2	2	2
Daily trip total: Ambler Access Road	62	40	26	26
Daily trip total: Dalton Highway	108	64	42	42

Source: HDR 2019b; Trilogly 2018a, 2018b; UA 2019; Wood 2019

Note: Ag = silver; Au = gold; Cu = copper; Pb = lead; Zn = zinc

Alaska Highway System legal load limit of 40 tons for tractor-trailer unit, 20 tons for single-trailer. Concentrates are loaded into sealed 30 metric-tonne (33 short ton) containers for truck transport to Fairbanks. Concentrates are hauled in double trailers on the proposed road, then in single trailers on Dalton Highway. It is important to distinguish between containers filled and trips on a road; trips include the empty backhaul trip. Bornite uses the same amount of supplies and fuel as Arctic, but fewer mill reagents. Sun and Smucker mills are half the size of Arctic mills, and use half the supplies and fuel, or use Arctic mill. A trip is a vehicle passing an observer in either direction. Travel in each direction is considered a separate trip. Traffic not included: Ambler Access Road construction/road maintenance and operations vehicles; commercial community deliveries; land management agency traffic; emergency/fire suppression traffic; and any concurrent mining exploration traffic.

Using the traffic information from Table 2-5 and scheduling for development and construction of the proposed road and mines in the District, a projection of traffic by phase is provided in Table 2-6. The range of traffic given is from the low Annual Average Daily Traffic (AADT) in the time period to the high AADT in that time period.

Table 2-6. Traffic projections for Ambler Road and Dalton Highway

Road Phase	Assumed time period	AADT on Ambler Road ^a	Additional AADT on Dalton Highway ^b
Phase 1	2025–2026	7–57	7–57
Phase 2	2027–2036	58–118	58–179
Phase 3	2037–2051	104–168	160–238
Phase 3 ^c	2052–2071	83, tapering to 3	123, tapering to 3

Source: HDR 2019b; Wood 2019; and internal calculations for the Supplemental EIS

^a AADT indicates traffic passing an observer in either direction. Ore concentrate is assumed to be hauled 24 hours/day.

^b AADT on the Dalton Highway is higher than on the proposed road, because 1 truck is assumed to haul 2 ore container trailers on the proposed road, but only 1 ore container trailer on the public highway, so the number of ore trucks doubles.

^c Phase 3 is broken into 2 time periods. The break point is after production at 3 of the 4 main mines is assumed to be finished and traffic decreases.

Rail Transport. Once the trucks reach Fairbanks, the containers would be removed from the trailers and compiled into a unit train for transport to the ports in Southcentral Alaska. Table 2-7 summarizes the estimated rail traffic to haul the processed ore for the 4 mining projects from Fairbanks to a port. A unit train is a train that transports a single commodity directly from producer to consumer. Each rail car is capable of holding of 2 containers in a single-stack configuration (versus a double-stack configuration). A unit train of approximately 75 cars is typical for Alaska and would result in each unit train carrying 150 containers. Using the 1,507 short wet tons per day production capacity of the Arctic Project, there would be approximately 1 train southbound every 2–3 days, as shown in Table 2-7.

Table 2-7. Estimated rail traffic to haul processed ore for the District from Fairbanks to a port

Project	Production rate per day (short wet tons)	Number of containers required for 1 day of production (outbound only)	Weekly frequency of 75-car-unit trains (both directions)
Arctic	1,507	46	4.3
Bornite	784	24	2.2
Sun	548	16	1.5
Smucker	548	16	1.5

Source: HDR 2019a; Wood 2019

Vessel Transport. Upon arrival at a port, the containers would be removed from the rail cars and stored temporarily in a container yard if a ship were not already berthed at the port. Ambler Metals (formerly Trilogy) has indicated that the likely port of choice would be the Port of Alaska at Anchorage. While land-side modifications may be necessary (e.g., creating container staging areas, adding a specialized crane to dump containers into the ship), no in-water construction is anticipated to take place at the port as an indirect consequence of the action alternatives. In-water modification likely would not be necessary at the Seward and Whittier ports, but may be necessary at Port MacKenzie, if those ports were chosen by the mining companies. Table 2-8 estimates the anticipated vessel traffic that would occur for the 4 mining projects. Ore is generally transported in a Panamax or Handymax-sized ship. An average carrying capacity of 50,000 dead weight tons (DWT; DWT are equivalent to tonnes) accounts for the majority of the ships in the Panamax and Handymax size ranges. Using 50,000 DWT as an average load capacity (55,116 short tons), a port would need storage capacity for a minimum of 1,670 containers in the container yard as well as capacity to hold loaded and empty unit trains to account for rail scheduling timelines. If the volume of containers being delivered to ports exceeds the storage capacity of the container yards, additional container yards may need to be constructed, other ports used, or delivery

schedules altered to meet the needs of container storage. Resolution of this issue is undetermined, and impacts cannot be defined at this time.

Table 2-8. Estimated monthly vessel traffic for the District

Project	Production rate per day (short wet tons)	Number of ships per month	Number of ships per year
Arctic	1,507	0.82	9.8
Bornite	984	0.43	5.1
Sun	548	0.29	3.4
Smucker	548	0.29	3.4

Source: HDR 2019a; Wood 2019

Existing ports at Anchorage, Seward, and Whittier have businesses and residential areas nearby. Among the issues that may need to be examined in future EISs for mining operations are air quality and health effects from the ship and train traffic and from any dust that may escape during the ore loading process (ore concentrate would be wet, and the cranes contemplated would not open the sealed ore concentrate containers until they were inside the hull of the ship; these measures typically would result in negligible dust). Other issues that may need to be examined more closely are the noise and visual effects of the additional port operations, and effects to automobile traffic. If selected, Port MacKenzie in particular may require examination of in-water work and new vessel traffic patterns on marine mammals in Cook Inlet. All of these would be dependent on the port(s) selected and the details of the operations proposed by the mining companies, and would be examined in their respective NEPA and permitting analysis.

Projected Timeline for Hypothetical Baseline Scenario

Using the projections from the Arctic Project’s timeline, anticipated construction and operational crew shifts, employment numbers, and production output, a general projection of the life of the Arctic Project can be developed. The other 3 projects would be anticipated to follow a similar development pattern. For purposes of the hypothetical baseline scenario, the Arctic Project would be developed first, followed closely by Bornite and later by Smucker and Sun in succession, which would likely use the mills at Bornite and Arctic. Table 2-9 provides the schedule for development of the District.

Table 2-9. Assumed mine development timing for the District*

Events Sequence	Start	End
Ambler Road EIS Record of Decision	2024	2024
AIDEA completion of business agreements with mine(s), state approvals, and financing	2025	2026
Ambler Road Phase 1 Design (AIDEA issue design and construction contracts, and complete design)	2027	2028
Ambler Road Right-of-Way Authorization (50-year term)	2024	2074
Ambler Road Construction, Phase 1, pioneer road	2028	2030
Ambler Road Construction, Phase 2, 1-lane road	2030	2032
Arctic Mine production	2033	2044
Bornite Mine production	2035	2069
Ambler Road Construction, Phase 3, 2-lane road	2040	2042
Sun Mine production	2045	2050

Events Sequence	Start	End
Smucker Mine production	2051	2056
Other mines, production	2045	2068
Last mine closure and reclamation	2068	2071
Ambler Road closure and reclamation ^a	2071	2074

Source: BLM analysis; DOWL 2016; UA 2019; Wood 2019

^a Road closure and reclamation is part of AIDEA's proposed action (see Chapter 2, Alternatives, Section 2.4.3, Features Common to All Alternatives, of the Draft Supplemental EIS, and DOWL 2016 for additional information).

Hypothetical Baseline Scenario Surface Disturbance

The potential for surface disturbance has been estimated for the 4 mines in the District (Table 2-10). Using the development footprint provided for the Arctic Project (Figure 2-1 and Figure 2-2), including access roads, an approximate acreage of surface disturbance was calculated (Trilogy 2018a). A similar footprint was used for the other 3 mines in the District. These approximate areas are shown on Map 10. Factors affecting the size of a proposed mine include the amount of ore to be mined, the depth to the ore and the thickness of orebody, the amount of waste and tailings to be disposed of, the distance to powerlines, the distance to employee housing, and the local topography. Only gross estimates of disturbance can be developed. These estimates are based on existing operations elsewhere and generally reflect a moderate stripping ratio of overburden to ore for surface mining, or depth from surface for underground operations. These are order of magnitude estimates, meaning they may be 50 percent higher or lower as the result of unknown or unforeseen circumstances. Variance from these estimates does not reflect on efficiency or management, but is the result of mining and transportation conditions inherent in a given deposit.

Table 2-10 describes the potential surface disturbance resulting from the projects in the District. Current and future exploration activities are anticipated to result in 5 to 15 acres of disturbance in the District. Currently, the Arctic Project has reported 5 acres of disturbance for exploration (Trilogy 2017b). Surface disturbance from exploration is not reflected in the table. No estimate was made of gravel needs required by the individual projects. Local material sources would be used wherever possible, including the use of excavated mine site material.

Table 2-10. Hypothetical surface disturbance within the District

Project	Resources (million short tons)	Mining method	Production disturbed acres
Arctic	43	Open pit	1,327
Bornite	182	Open pit	1,223
Smucker	11.6	Open pit	837
		Underground	282
Sun	11	Open pit	837 ^{Te}

Source: Trilogy 2018a, 2018b

2.2. Road Access Scenarios*

AIDEA filed an application for a ROW to construct a private industrial access road and associated facilities from the Dalton Highway, crossing multiple land ownerships, including federal public lands managed by the BLM and the National Park Service, to the Ambler Mining District. AIDEA also proposes that communities would be allowed to use the road for delivery of commercial goods. However, interested communities would need to develop any secondary access means on their own (i.e., any

ancillary roads that would be needed to connect the community to the Ambler Road would not be developed by AIDEA). Members of the public and some cooperating agencies have expressed concern over the potential effects of trespass along the private road on subsistence use and cultural resources, and the effects of possible future authorized public use on the region. While the road would not be open to the general public by design, some public use, including trespass, is expected. This section lays out reasonably foreseeable access scenarios associated with commercial use, and public and non-industrial use, including trespass, of the road. The effects of these scenarios are described in Chapter 3.

2.2.1 Commercial Access Scenario*

AIDEA's application indicated that some commercial deliveries may be allowed via the road. This section describes the reasonably foreseeable scenario for commercial deliveries using the proposed alternatives. This section also describes the assumptions used to develop the scenario based on intentions stated by AIDEA. Federal statute and regulations provide that BLM and NPS determine the scope of allowable access through the terms and conditions of any ROW authorizations they may issue; AIDEA would have no independent discretion or permit authority if issued a ROW. The text below provides details about the proximity of communities, mining claims, and private property to the alternatives as a basis for developing assumptions about how communities or other landowners might use the road for "commercial deliveries." Refer to Map 9 for locations of communities, private lands, mining claims, and existing/historic travel routes in relation to the alternatives.

Background from AIDEA

AIDEA has proposed in its application that some commercial deliveries may be allowed under a permit process. AIDEA's application states:

Other permitted traffic at times could include commercial deliveries of goods for local communities or commercial transport for local residents and emergency response authorized through access permits. Only commercially licensed drivers would be allowed on the road. The traffic level for these local community and emergency response operations would likely total less than 1 truck or bus per week. No additional work outside the approved ROW would occur to accommodate this. – *Revised SF299, June 2016, p. 5*

Although the proposed road would have controlled access, local communities would have the potential to hire commercial transportation providers to deliver fuel or freight to staging areas where the communities could access it, probably in the winter. Alternatively, local residents could instead form their own companies to provide these services. – *Revised SF299, June 2016, p. 16*

An April 2019 presentation by AIDEA to the BLM at a cumulative effects workshop for this project also indicated that agencies (with a permit) could have limited access on the road (e.g., for monitoring or management activities). One slide indicated that the road would have a "limited access designation" and listed state and federal landowners, regional Alaska Native corporations, and "others TBD" as the groups apparently intended to have limited access.

Commercial Deliveries Scenario

All Alternatives

The following assumptions apply to analysis of all alternatives:

- Use of the road would be by authorization only, by drivers who had road-specific training and who were equipped with 2-way very-high-frequency radios. Almost all use would be by those with commercial drivers' licenses. Exceptions would be agency access or during emergencies.

- AIDEA’s road operator would have authority to allow drivers access under limited terms— vehicles associated with large-scale mines in the District, commercial trucks making deliveries of goods for community residents or landowners along the road, and landowning agency vehicles, including those of Alaska Native regional corporations that own land adjoining the road. Agency access is likely to include those that need access for permit-compliance inspections related to the road and mines, land management, land use planning, scientific research, and, if necessary, firefighting. Alaska State Troopers on official business likely would be authorized. Community emergency medical personnel would be included for emergency response and medical evacuation. Transport of the general public, either by commercial vehicle or public transit, would not be included in the authorization. Commercial vehicles delivering goods or fuel for communities would be subject to insurance requirements and road-use fees/tolls set by AIDEA or its road operator. The cost to drive the road for commercial deliveries has not been determined at this time.
- Owners of the land crossed by the road could decide whether to authorize other individual users under separate decision-making processes. For example, if another mine were proposed outside the District, access could be allowed, but authorization would have to come through the underlying landowner(s) and not from AIDEA or its road operator. Landowners issuing such authorization would do so in consultation with AIDEA and its road operator, though AIDEA concurrence would not be required, and all drivers would be required to follow AIDEA road safety and operations requirements.⁴
- Landowners could issue a separate authorization for a boat landing, storage shed or warehouse, bulk fuel storage tank, or connecting road or driveway that might aid the transfer of commercial deliveries to communities or private lands. These would be separate environmental analyses and public interest decisions.

In general, the opportunities for less-expensive transportation of goods and people to and from a study area community increase with the proximity of the community to the road. The distance of a particular study area community from the proposed road would differ across the action alternatives. Table 2-11 shows the approximate straight-line distance between the study area communities and the roadway alignment under each action alternative.

Table 2-11. Distance of study area communities from the proposed road under the action alternatives (in miles)

Community	Alternative A	Alternative B	Alternative C
Alatna	35	35	37
Allakaket	34	34	39
Bettles	8	8	77
Evansville	8	8	78
Hughes	68	55	3
Huslia	92	92	47
Ambler	22	22	22

⁴ As a practical matter, government landowners have the ability and sometimes a requirement to authorize access across public lands by trail, road, or overland at any time. Native corporation landowners also have this ability. In practical terms, it may make sense if the Ambler Road were in place to authorize new use of the then-existing road rather than authorize a separate parallel access road. The intent of these bullet points is to illustrate the limits of what AIDEA would be able to authorize on its own versus what could be authorized by the underlying landowner through its standard permitting processes.

Community	Alternative A	Alternative B	Alternative C
Kobuk	9	9	2
Shungnak	15	15	5
Rampart	105	105	18

All action alternatives would be similar in their proximity to communities at the west end of the road. Maps 10 and 11 illustrate the potential future transportation network between these communities and the 3 alternatives as described below:

- **Kobuk:** Alternatives A and B are expected to connect directly to the existing 15-mile road that connects Bornite to Kobuk. Bornite is an active mining prospect; it is reasonable to assume that an existing tractor trail would be improved to road standards approximately 2.5 miles to make the connection, which in turn would connect the proposed road to Kobuk. Alternative C would use the alignment of the existing 15-mile road and would connect directly with Kobuk’s local road system.
- **Shungnak:** Shungnak lies about 12 river miles down the Kobuk River from Kobuk (8 overland miles in winter).⁵ These additional distances for delivery of goods by boat or snowmobile would apply to all build alternatives.
- **Ambler:** Ambler lies about 38 river miles downstream from the road’s end at the Ambler River (approximately 26 miles along the river valley in winter). This compares to 62 river miles or 32 miles overland (winter) from Kobuk.

It is reasonably foreseeable that, once the road is open to commercial deliveries:

- Kobuk would see direct deliveries to the community, which would likely include regular delivery of bulk fuel, groceries, and large loads (e.g., construction materials).
- Shungnak would benefit by transporting road-delivered goods by boat or snowmobile from Kobuk, but these would likely be smaller loads.
- Ambler would desire to get goods by boat or snowmobile, but this would occur less frequently than at Shungnak because of distance.

Alternatives A and B

In addition to the access cited above, Alternatives A and B would likely provide improved commercial deliveries to other communities. In the following text, where Alternatives A and B overlap, the mileposts given are based on Alternative A. The following communities are nearest to the Alternatives A and B alignment:

- Bettles/Evansville lies about 24 river miles south of road Milepost (MP) 45 via the John River, or 8.5 overland miles south of either road MP 38.5 or 45.
- Alatna and Allakaket lie about 85 river miles south of road MP 45 via the John and Koyukuk rivers. Potential winter overland routes could be about 57 miles from road MP 90, via the Alatna River valley, or 52 miles from road MP 39.5, via Evansville and Bettles.

It is reasonably foreseeable that once the road is open to commercial deliveries:

⁵ The term “river miles” accounts for bends in the river and is an approximation of the mileage by boat. The term “overland miles” or indications of winter use is based loosely on topography or known existing winter trails and almost always does not follow the bends in the rivers but cuts across them, resulting in shorter winter distances between points.

- The Bettles/Evansville community would desire to re-route the winter road (ice road) they build most years to the Dalton Highway to instead access the proposed road (about 1/3 the length). This would also continue to benefit Alatna and Allakaket. The communities may need to contribute to road maintenance costs, and a separate authorization from land managers would be required. It is not likely the road would be authorized for use by the general public, but it is reasonably foreseeable that it would be authorized for commercial deliveries, which is in keeping with AIDEA's application.
- The ability to pick up commercial deliveries by boat at the road may be desired by Bettles/Evansville, but this would likely involve less freight than winter access. Alatna and Allakaket are sufficiently distant that boat access would be anticipated to be rare.

The Alternatives A and B alignment comes close to several areas that would be anticipated to desire some access for commercial deliveries. The Alternatives A and B alignment would:

- Pass between a collection of state mining claims located 1–3 miles north and south of the road route at about road MP 5 to MP 11.
- Pass south of mining claims near Wild Lake and Flat Creek, about 30 miles up the Wild River, and other claims at Crevice Creek, about 29 miles up Timber Creek and John River. Access for both would originate in the MP 37–39 area via known winter trails (Revised Statute [RS] 2477 routes).
- Pass south of the south end of Iniakuk Lake, about 1.5 miles from road MP 89. The Iniakuk Lake Wilderness Lodge and perhaps other private property owners on the lake are likely to desire occasional commercial delivery of building materials, fuel, or food supplies for transport over snow.
- Pass south of 3 Native Allotment parcels near Mauneluk River and Avaraak Lake, within about 1 mile of road MP 130 and 133. A material site, which would be accessible by road, is adjacent to 1 of the properties.
- Pass north of the north end of Narvak Lake, about 3.5 miles from road MP 157.5. Peace of Selby Wilderness Lodge is located near the north end of the lake, and a Native Allotment parcel is located near the south end of the lake.
- Pass north of a Native Allotment parcel on the Mauneluk River, about 2.5 miles downstream of road MP 174.
- End 3–4 miles from 2 Native Allotment parcels fronting on both the Ambler River and Lake Anirak. Multiple other allotments occur downstream, mostly nearer to Ambler.
- Where Alternatives A and B split, only Alternative A would pass north of Nutuvukti Lake, where a Native Allotment is located about 1 mile from road MP 133.
- Only Alternative B would pass north of Norutak Lake, about 0.5 mile from the north end of the lake, near road MP 131, where there are 3 Native Allotment parcels that appear to be currently undeveloped.

It is reasonable to assume that there would be demand by these mining claim holders and landowners for commercial deliveries of supplies, mostly for transport over snow from the road to the final destination.

Over the 50-year life of the proposed road, in addition to Kobuk, it is reasonable to assume that Bettles/Evansville, Shungnak, and/or Ambler would pursue additional permanent roads connecting to the road (Alternative A or B). Bettles/Evansville is on the opposite side of the Koyukuk River and would require a large, expensive bridge of 600 feet or more, so this road is assumed to develop as a replacement

winter road or a permanent road that terminates across the river, requiring a boat to make the last connection. It is reasonable to assume that connecting roads would be authorized as public roads, given current ADOT Regional Transportation Planning (DOT&PF 2022) and the assumption that construction of any connecting road would involve some public funding. Therefore, it is also reasonable to assume that the public, especially residents of the community, would use the connecting road.

Alternative C

In addition to Kobuk, Shungnak, and Ambler, discussed above for all alternatives, the following communities are nearest to the Alternative C alignment:

- Tanana lies 33 miles south of road MP 76 via an existing Tanana-Allakaket winter trail, an RS2477 route in the Ptarmigan Creek valley.
- Hughes lies fewer than 4 miles south of road MP 197.
- Alatna and Allakaket lie about 71 miles north of road MP 105 via an existing Tanana-Allakaket winter trail, an RS2477 route, and 51 river miles from MP 179 on the Koyukuk River.
- Huslia lies about 207 river miles southwest of road MP 279 (Hughes area) along the Koyukuk River and about 63 overland (winter) miles south of road MP 247 along the Koyukuk and Hogatza river drainages. Also, it is reasonable to assume that a direct road connection to Hogatza's existing mining road network would develop, and thus access to Hog Landing near the confluence of the Hogatza and Koyukuk rivers would occur. Huslia lies more than 100 river miles from Hog Landing via the mainstem Koyukuk River (85 via Cutoff Slough), but lies about 37 overland (winter) miles from Hog Landing.
- Rampart is close in straight-line miles but is located on the opposite side of the Yukon River. Given terrain and the river, it is likely that Rampart would not take deliveries from the proposed road.

It is reasonably foreseeable that once the proposed road is open to commercial deliveries:

- Hughes would desire deliveries year round.
- Alatna and Allakaket would likely continue to depend primarily on air service and the late-winter road to Bettles for deliveries, but would occasionally take delivery by boat or snowmobile from Alternative C.
- Tanana, which has road access to a point across the Yukon River and about 8 miles upstream, likely would not arrange for deliveries via the Alternative C alignment.
- Huslia, which normally has summer barge service, would likely not seek deliveries via the proposed road. The Hog Landing road would provide relatively close winter access, but it presumably is maintained for summer use by barges and not for winter. Occasional delivery by road and boat may occur in summer when a delivery is needed, outside the regular Huslia barge schedule.

In addition, the Alternative C alignment would:

- Pass through a large private parcel near road MP 20.
- Pass south of a set of multiple mining claims in the Ray River valley, located about 8 miles from road MP 23. Because of topography, any road connection would be longer. It is worth noting that some of these claims lie a similar distance from the Dalton Highway, and no road has been developed to them.

- Pass south of a large block of mining claims in the Spooky Valley area, about 11 miles from road MP 63 from up Gishna Creek.
- Pass east of the Utopia airstrip and its associated 10-mile road system supporting the U.S. Air Force’s Indian Mountain Long Range Radar Station, about 7 miles from road MP 155.
- Pass near multiple Native Allotment parcels along the Koyukuk River at and upstream of Hughes.
- Pass north of a large block of mining claims near Hogatza. It would be about 8 miles from the proposed road MP 250 to tie into an existing road. The existing 35-mile Hogatza-area road system links mining claims, an airstrip, and Hog Landing near the confluence of the Hogatza and Koyukuk rivers.
- Pass close to multiple Native Allotment parcels near Kobuk, north and south of the Kobuk River.

It is also reasonably foreseeable that:

- The Hogatza mining area could seek a direct connection to the proposed road and, even without an all-season road, would deliver some equipment for overland transport in winter. These would be by separate authorization.
- Other mining claimants may seek direct connection or wish to use the road for delivery of some equipment in winter.
- The Air Force likely may wish to have use the road for access by radar station maintenance personnel and for delivery of equipment.
- Some Native Allotment owners may also seek commercial deliveries of relatively small loads for transport to their sites for final delivery by boat or snowmobile.

Over the 50-year life of the road, it is reasonably foreseeable that Hughes would pursue a direct, year-round road connection to the community along the east side of the Koyukuk River and would receive regular commercial deliveries, including bulk fuel, groceries, and relatively large loads (e.g., construction materials). The other communities may see intermittent deliveries of relatively small loads that would be transported from the road by snowmobile or boat.

2.2.2 Public and Non-Industrial Access*

AIDEA’s ROW application expressly requests the ROW for an “industrial-access road,” for which access “would be controlled and primarily limited to mining-related industrial uses, although some commercial uses may be allowed under a permit process.” AIDEA also acknowledges the potential for government use, such as BLM use for mobilization of equipment and personnel for fire suppression actions or other fire management in the planning area.

For these reasons, the BLM is not considering issuance of a ROW for a public road, and a public road is not among the action alternatives being considered for analysis in the EIS. The proposed road would be closed to the general public. AIDEA, in comments on the original EIS and in published material on its project website, indicates the following combination of legal and contractual requirements that would keep the road from being open to the general public:

- The request is that the landowners (mostly federal and state government) grant only limited-access ROW; the EIS Record of Decision and federal permit stipulations can restrict road uses.
- It is likely that private landowners such as Native corporations would require the road to be closed to the public where the ROW crossed their lands.

- Any proposal to open the road to the public would require all landowners to agree.
- The road ROW (land rights) would be issued to a private corporation, not the general state or federal government.
- The entity seeking to own and manage the road as a public road, including the State of Alaska, would be required to buy out AIDEA's interest in the road.
- There would be restrictions on road use in the contractual terms financing construction and operation.
- Endorsements in insurance policies for the road would be based on restricted road use.
- The identified road users (mine owners/operators) ultimately responsible for paying back road construction costs through road-use fees want road use limited for safety reasons.

ADNR, in its role as a cooperating agency for the project, has stated that it must separately adjudicate an easement for state lands and during that process ADNR will address use of the road and restrictions on use. AIDEA has applied to ADNR for an exclusive easement for a private industrial road with potential commercial use for delivery of goods and services but no public access. Per the State of Alaska, ADNR will address use of the road and restrictions on use when it considers the easement application.

Modifying a restricted access industrial road to one capable of supporting public access would require a new ROW application and authorization process and renegotiation of easements, financing, and insurance. Such a road would have a different purpose and need. Any application to convert an approved, restricted industrial access road to a public road across federal public lands would require additional NEPA, ANILCA (1980) Section 810, and National Historic Preservation Act analyses, including appropriate public involvement and consultation with federal, tribal, state, and local government entities. No such application has been submitted; however, given the requested ROW time frame of 50 years, it is reasonably foreseeable that once the road is constructed, local residents within the general area of the road, as well as other residents within Alaska, will seek ways to access the road both lawfully and unlawfully.

There are a few examples of existing industrial roads in northern Alaska that have restricted access. Each road in the following discussion is uniquely different in terms of land ownership underlying the road and authorization(s) granted. However, they provide useful examples of past, present and possible future actions regarding public use of industrial access roads.

The Pogo Mine Road is a 56-mile-long restricted access road that begins on the Richardson Highway near Delta Junction and ends at the Pogo Mine. The road is located on state lands and authorized by ADNR under two separate ROWs, one a public ROW with restricted access for the first 23 miles issued to the DNR and the second an exclusive ROW for the remainder of the road to Teck Pogo (Teck-Pogo, Inc. 2003). Access to the road is controlled by a staffed security gate, approximately a half mile from the highway. Public access to the road is strictly controlled. An April 16, 2019, letter from AIDEA to the BLM stated AIDEA's belief that land managers have the authority to limit use of the road, such as ADNR has done with the Pogo Mine Road. AIDEA stated that the Ambler Road would be intended as an industrial access road and specified that their proposal is that "individual miners and recreational miners would not be authorized to use the road" under AIDEA's ROW grant. However, miners or other land users who have a legitimate need to access can apply for a land use authorization from ADNR allowing them to utilize the road.

As stated within the ROW, once the useful life of the mine is over, the first 23 miles of the Pogo Mine Road would convert to a public road to provide access to the Tanana Valley State Forest and other State

Lands, in accordance with state land plans for this area (Teck-Pogo, Inc. 2003). The remainder would be reclaimed with the decommissioning of the mine. The Northwest Alaska Transportation Plan 2022 Update prepared by the Alaska Department of Transportation and Public Facilities (DOT&PF 2022) contains key recommendations for improving transportation infrastructure in the next 20 years. Within the report are new potential road linkages that are proposed for planning and environmental linkage studies, including an Ambler-Shungnak-Kobuk connection route envisioned to be connected to the existing Bornite Road. “If the private Ambler Mining District road is developed, these communities could potentially connect to the National Highway System on a permit basis” (DOT&PF 2022:58).

The Delong Mountain Transportation System (DMTS) includes a 52-mile-long restricted access road that crosses private land owned by the NANA Regional Corporation (NANA) connecting the Red Dog Mine to port facilities at its terminus on the Chukchi Sea. The entirety of the DMTS, including the associated facilities, is owned by AIDEA and authorized through a lease from NANA. In their 2017 Asset Management Review, AIDEA lists risks and opportunities to the DMTS (AIDEA 2017). Opportunities focused on the potential uses of the DMTS after the current mineral deposit is fully worked and depleted, which is estimated to occur in 2031. Listed opportunities include additional planned exploration by Teck that could increase the life of the mine, other mineral development within the region, or use of the DMTS for other purposes, such as assisting local community development by connecting to the nearby communities of Noatak or Kivalina; continuing to provide lower cost fuel to local residents; or providing support for scientific research, tourism, or Arctic shipping.

The DMTS is currently used by the residents of Kivalina to access subsistence hunting (Arctic Sounder 2015; WACH Working Group Minutes 2019) in compliance with safety best practices and guidelines. In 2018 Teck prepared a draft Environmental Evaluation Document (EED) to support a U.S. Army Corps of Engineers (USACE) Environmental Assessment of the proposed Anarraaq and Aktigirug Exploration Program, which included construction of 13 miles of new road (Teck 2018b). Although the access road is not open to the public, inadvertent casual use of the road by residents of Kivalina and Noatak was expected to occur and analyzed as part of the proposed action. Similarly, The North Slope oilfield contains an extensive road network on both state and federal lands that is closed to the general public and access is controlled by industry. However, North Slope residents have successfully negotiated access to and use of the road network through a Good Neighbor Agreement, allowing them the ability to use the oilfield roads to access the public Dalton Highway.

Many comments on the original EIS and in the development of this Draft Supplemental EIS question the ability of the BLM and AIDEA to keep the Ambler Road private, basing their comments on the opening of the Dalton Highway to the general public after nearly 20 years of its north end being open to industrial traffic only. While the situations differ, given the dearth of developed infrastructure in Alaska, and the value of the road and associated facilities, it is reasonably foreseeable that ultimately, efforts will be taken to convert the Ambler Road to a public-accessible road, not unlike opportunities contemplated for the DMTS. During the initial EIS process, the Alaska Outdoor Council stated that they will pursue all channels to ensure the road is permanent and open to the public (AOC 2019). Further, once communities are connected to the road for commercial purposes, it is unlikely that those commercial uses would be discontinued.

AIDEA has proposed that public access to the Ambler Road would be restricted by means of a staffed gate facility near the eastern end of the road and another near the western end. The gate facilities would be staffed 24 hours per day for the life of the road. AIDEA proposes to hire others to provide road security and maintenance. Security personnel and authorized drivers would be in continual radio contact as they traversed the road and would report unauthorized use of the road.

Crossing of the proposed road by the general public would be allowed for traditional overland transportation (i.e., snowmobile, dog team, on foot). AIDEA may specify certain areas for safe crossing. Use of the road by the general public for purposes other than to cross would not be allowed. Area residents and landowners would have the ability to take delivery of goods by commercial carrier as described in Section 2.2.1, Commercial Access Scenario.

Given the above discussion, the following assumptions are reasonably foreseeable with regard to public and non-industrial access of the Ambler Road:

- Local residents will use portions of the Ambler Road in conjunction with subsistence use of the area, traveling by snowmachine, off-highway vehicle (OHV), or on foot, including using the road to facilitate boat access.
- Should commercial access result in connecting roads to local communities, those communities will negotiate access for local residents to use the road to connect to the Dalton Highway.
- Individuals with valid existing land use rights within the area (such as miners wanting to access their state or federal mining claims) may apply for road access.
- After the road is constructed, efforts may be made to convert the road to a public road. This would require a new application, additional NEPA analysis, and the issuance of new authorizations. The road would need to be constructed to appropriate standards for public health and safety.

2.2.3 Trespass Scenario*

Members of the public and some cooperating agencies have expressed concern over the potential effects of trespass along the Ambler Road and the impacts of trespass on subsistence use and cultural resources. For the portions of the road that cross public lands, the road would not be open to the general public, including people who live in the project area, by design and general public access would not be authorized under the BLM's ROW permit; however, there is potential that use of the road and associated facilities, such as airstrips, by unauthorized users (i.e., trespass) will occur. The following assumptions are reasonably foreseeable with regard to unauthorized use associated with the Ambler Road:

- Unauthorized use of the road and airstrips would occur by both regional residents and non-local visitors in pursuit of hunting, angling, or other recreational opportunities.
- Overland unauthorized use of the road would primarily occur by people on snowmobiles and OHVs, and points of access would be focused at locations where existing OHV trails or roads intersect the road alignment and away from staffed gates and entrances, which unauthorized users would avoid due to the presence of security personnel.
- Unauthorized use would be sporadic and isolated. It could occur at any time but would be most likely to occur during hunting season.
- Unauthorized use could also occur via boat access where bridges intersect with the road.
- The public Dahl Creek airstrip is located approximately 10 miles south of the proposed road and could serve as an access point for unauthorized use of the road, given existing trails.
- The 3 new airstrips are proposed for each alternative road route also provide potential unauthorized access to the road and the adjacent lands.

2.2.4 Fiber-Optic Communications and Related Issues

AIDEA has applied for placement of a fiber-optic communications line for Internet and telephone service along the proposed road. This is intended first to serve the road maintenance stations and operations along the length of the road. AIDEA notes that District customers and communities also are likely to desire connection to the fiber-optic line. It is reasonable to assume that residents of the area would desire connection if it would result in better Internet connection (greater bandwidth and speed) for equal or less cost than currently available via satellite. Over the 50-year life of the proposed road, the following are considered reasonably foreseeable:

- Alternatives A, B, and C may result in fiber-optic connection to Kobuk and Shungnak (the 2 already are connected by power transmission line).
- Alternatives A and B, in addition, may result in fiber-optic connection to Bettles/Evansville.
- Alternative C, in addition, may result in fiber-optic connection to Hughes and to a mining operation at Hogatza and possibly to the military's Long Range Radar site on Indian Mountain.

Construction of spur line connections to AIDEA's proposed fiber-optic line would be projects that are separate from AIDEA's Ambler Road Project and would need to be paid for by communications companies or others outside of AIDEA. These projects would require additional authorization from agencies that manage lands the fiber-optic spur line would cross.

2.3. Past, Present, and Other Reasonably Foreseeable Actions*

This chapter identifies past, present, and other reasonably foreseeable future actions that establish the basis for the cumulative effects analysis. The method for determining the cumulative impacts of the proposed project is based on *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) and Chapter 6.8.3 (Cumulative Effects) of the BLM NEPA Handbook (BLM 2008a). It includes:

- Definition of spatial (geographic) and temporal (time frame) boundaries of the analysis
- Identification of past, present, and reasonably foreseeable actions within the spatial and temporal boundaries and their potential environmental effects on resources directly or indirectly affected by alternatives

2.3.1 Geographic Scope and Time Frame for Cumulative Impacts Analysis

The spatial scope for analysis of cumulative effects is considered the same as the affected environment for each resource and is shown on maps in the EIS for each resource. Generally, the area in question is the proposed road corridor for each alternative and the area described in Section 2.1, Mining Development Scenario in the Ambler Mining District, and Section 2.2, Road Access Scenarios, for the mining scenario. For some resources, such as subsistence and wildlife, the areas are much larger because of the range of the affected subsistence hunters and of species such as fish and caribou.

The time frame for the cumulative impacts analysis is the same for all resources and includes past, present, and future actions. The temporal boundary extends back to when the area's human activities were primarily traditional uses by indigenous people. Mining exploration activities have occurred in the region stretching back to the late 1800s. The period for road impacts analysis extends through 2072, which encompasses the 50-year life of the proposed BLM ROW; however, water treatment at potential mines could extend the cumulative impacts much longer. See the assumed development schedule in Table 2-8.

2.3.2 Past and Present Actions*

The following lists past and present actions that have shaped baseline conditions presented in the Affected Environment sections of the EIS. Baseline conditions are a combination of natural conditions and conditions created by the past and present actions. The actions may be considered collectively as past and present actions—that is, actions of increased access and human activity and increased land management that create trends. The trends have formalized land ownership and management for both development and conservation and for managing human activity. Past and present actions include:

- Placer and hard rock mineral exploration and mining development, including gold rushes in Nome, Klondike/Yukon Territory, and Interior Alaska, that brought people from outside Alaska to and through the study area in the late 1800s and early 1900s, and specific exploration and staking of claims in the District and other parts of the study area. Mineral exploration has been occurring within the Ambler District since the 1950s (Cardno 2015). Small-scale mining development and ore exploration still occurs within the Ambler District and is currently supported by air since there is no road access to the District.
- Collective actions of government, businesses, and individuals that resulted in a transition in rural Alaska communities from traditional subsistence economies to partial cash economies, with associated cultural changes, including shifts in sovereignty, housing, heating, food, sanitation, education, transportation, communication, and health. These trends could potentially extend into the future.
- Use of historic travel routes by area residents and explorers, originally by dog sled, but over time by larger or faster equipment (e.g., snowmobiles, cat trains, ice roads); clearing of some routes; invoking of RS2477 ROWs by the State of Alaska. Such transportation uses are expected to continue into the future.
- A myriad of actions on a global scale that emit greenhouse gases (GHGs) and contribute to climate changes and to associated noticeable effects on the ground in the project area, including permafrost degradation or warming and seasonal changes (e.g., shorter winters).
- Recreational exploration of the Brooks Range and area rivers, along with recent efforts to expand Interior Alaska tourism (e.g., Explore Fairbanks marketing efforts; former Governor Bill Walker’s delegation to China) and popularization of Alaska’s wildlife, wilderness areas, and aurora borealis, leading to further recreational use and to land conservation. This growing recreation trend could continue into the future.
- Increasing levels of hunting in rural portions of Alaska by nonlocal hunters including nonresident, foreign and urban Alaskan hunters since roughly the 1950s has resulted in the growth of commercial hunting services, e.g., booking agents, guides and transporters who support hunters.
- Adoption of land legislation and land use and plans, including:
 - Alaska Statehood Act of 1959, resulting in large areas of federal land being transferred to the new state.
 - Alaska Native Claims Settlement Act (1972), resulting in formal land ownership of large tracts by Alaska Native regional and village corporations.
 - ANILCA, resulting in the creation of national parks, national wildlife refuges, wild and scenic rivers, and other conservation system units in the project area and statewide. Additionally, ANILCA identified subsistence as the priority use of fish and wildlife throughout Alaska.
 - Land and resource management plans by large-scale landowners.

- Transportation changes, including:
 - Construction of the Trans-Alaska Pipeline System (TAPS), the Dalton Highway, the Alaska Railroad, and the Tanana Road, and the opening of the Dalton Highway to the public.
 - Construction of roads and airports in rural Alaska communities. Additional road and airport work would likely continue.
 - Establishment of barge/boat services on rivers and streams, and widespread use of motorized personal boats. Such boat use is expected to continue into the future.

- End of dog teams as a primary means of travel with widespread, common use now of snow machines, all-terrain vehicles, prop- and jet-drive boats, and fixed-wing airplanes for travel between communities and transport of hunters into remote areas.
- Use of helicopters for industrial exploration and mining activities, wildlife and fish surveys, and many other applications.
- DOT&PF is currently implementing several reconstruction projects along the Dalton Highway (from MP 0 to 414) to ensure design standards are met and to improve conditions related to safety, efficiency, performance, longevity, and maintenance costs.

- Oil and gas exploration and development on the North Slope, starting in earnest in the 1960s and 1970s. Current developments include the Prudhoe Bay, Greater Mooses Tooth I and II, and Liberty (offshore) projects.

In 2018, ADNR requested priority conveyance of BLM-managed lands to the State of Alaska in the area AIDEA has proposed for the road, near the intersection of Alternatives A/B and the Dalton Highway at MP 161. The conveyance would be part of Alaska's selections under the Alaska Statehood Act. The lands are currently withdrawn by Public Land Order 5150 as part of the TAPS corridor and are not eligible for state selection until and unless the Public Land Order is revoked or modified. ADNR, as a cooperating agency for this Supplemental EIS, requested that the state's top-filing on these lands be disclosed in the EIS. The BLM has determined that such conveyance is not reasonably foreseeable, so this is not listed as a past, present, or reasonably foreseeable action; however, it is acknowledged as an ADNR request.

2.3.3 Other Reasonably Foreseeable Actions*

This section describes other RFAs regardless of the agency (federal or non-federal) or person who undertakes such other actions. Per BLM guidance (BLM 2008), RFAs are not limited to those that are approved or funded; however, the BLM is not required to speculate about future actions. The following are RFAs identified within the temporal and geographic boundaries of the analysis:

- **North Slope Development.** Further Arctic oil and gas development in new areas: Potential locations include the Arctic National Wildlife Refuge Coastal Plain, National Petroleum Reserve in Alaska (NPR-A), and offshore. Construction of a natural gas pipeline and production of natural gas also is possible. Any of these would affect Dalton Highway use. One development in the NPR-A, known as the Willow Master Development Plan Project, was approved by the BLM in March 2023. Development in the Coastal Plain, offshore, or development of natural gas infrastructure is currently not reasonably foreseeable, but new development could feasibly occur in the next 50 years, which is the requested ROW time frame. Over the same period, it is reasonably foreseeable that some existing North Slope oil fields will close and that jobs will be lost in those areas. The entire TAPS could close (Magill 2012), but this is not considered reasonably foreseeable. In addition to oil and gas development, the State of Alaska and North Slope Borough are partnering on an Arctic Strategic Transportation and Resources (ASTAR)

project that could connect most borough communities and the Red Dog Mine and provide access for oil and hard rock mineral exploration and development. State funds (\$7.7 million) were obligated in 2017 and currently are being spent on background data collection and planning.

- **Small-scale mineral exploration.** Small-scale mineral exploration supported by air is expected to continue at existing or increased levels in the future. Interest in mineral exploration is expected to increase over time in response to a growing demand for critical minerals at state, national, and global levels. This projection is further supported by recent increases in the number of mining claims in the District. Since existing mining claims in the District lack the access needed for development, there is a potential for interest in mining claims to decrease in the future if the proposed Ambler road is not constructed. However, given the District's significant mineral potential, longstanding history of mineral exploration, and high number of existing mining claims, interest in mineral exploration is expected to persist regardless of the outcome of the proposed Ambler Road, and alternative means of access (whether by surface, air, or other emerging technologies) would likely be pursued by the industry.
- **Extension and Eventual Closure of Red Dog Mine.** Red Dog Mine originally was slated to close by 2031, but currently is undergoing permitting for a road extension and underground exploration program estimated to last 4 years. Whether that exploration results in further long-term mining is unclear. However, within the 50-year life of the proposed road, Red Dog Mine would be expected to close, accompanied by reduction in regional jobs and borough income.
- **Climate Change Actions and Responses.** Actions related to climate change, including actions globally that result in emissions of GHG (primarily actions that result in the burning of fossil fuels) and in-state actions in response to climate change, such as relocations of facilities due to permafrost thawing or water level changes, and TAPS and Dalton Highway projects related to addressing permafrost issues. These are simply examples; no specific projects are reasonably foreseeable.
- **Dalton Highway Improvements.** Actions to widen and otherwise improve the Dalton Highway will be implemented by DOT&PF, which has invested \$175 million to construction projects planned along the Dalton Highway corridor over the next 5 years.
- **OTZ Communication Towers.** OTZ is planning to construct 13 new communication towers in the vicinity of the Ambler Road. AIDEA has indicated that utilizing some of these towers for the Ambler Road project would not be reasonable due to reliability, cost, and capability concerns. However, collaboration between AIDEA and OTZ would be possible to look for opportunities for their mutual benefit and public benefit.
- **Fiber-Optic Development Funding:** Tanana Chiefs Conference was recently awarded \$303 million to provide fiber-optic cable connectivity to the communities of Alatna, Allakaket, Hughes, and Huslia.
- **ANCSA 17(d)(1) Withdrawals EIS.** The BLM is analyzing the revocation of existing 17(d)(1) withdrawals in 5 planning areas, including the Kobuk-Seward Peninsula Planning Area, which overlaps the Ambler Road project area.
- **Port of Nome Expansion Project.** The Port of Nome Expansion Project is being proposed by the USACE and City of Nome to alleviate existing vessel restrictions that are imposed by insufficient channel depths and harbor area. The project aims to provide larger vessels improved access to Nome's existing harbor by enlarging the outer basin and creating a new deep-water basin with a depth of minus 40 feet. Dredging would be required to deepen and maintain both basins and

associated navigation channels (USACE 2023). The project has an estimated completion date of 2030.

- **Port of Alaska Modernizations.** The Port of Alaska’s Modernization Program was created in 2014 to provide 4 new terminals via a phased program comprised of multiple projects. The program aims to replace aging docks and related infrastructure, improve operational safety and efficiency, accommodate modern shipping operations, and improve resiliency. Four projects (of 8 total) are planned for future construction between 2025-2032, contingent on available funding (Port of Alaska 2023).
- **Cape Blossom Road.** The Alaska DOT&PF has secured funding to construct a gravel road from Kotzebue, Alaska, south across the Baldwin Peninsula to a beach access area near Cape Blossom. The project is intended to connect Kotzebue, the shipping hub for the Northwest Arctic region, to a viable arctic port at Cape Blossom with access to deeper water. The Cape Blossom Road is being designed for commercial freight transport and recreational uses with an estimated volume of 100 vehicles per day or less. The project is expected to be completed in the 2025 (DOT&PF 2022b, 2023).
- **Mahn Choh Mine.** The Manh Choh project plan includes small open pit mining near the traditional Alaska Native village of Tetlin from which rock will be trucked about 240 miles 1-way for processing at the existing Kinross Fort Knox mine, located about 25 road miles northeast of Fairbanks. Access road construction for the proposed mine, a twin road and a site road, and site preparation started in 2022 with completion by the end of 2023. The mine is estimated to produce for about 4 to 5 years (Kinross 2023). This new mine would add truck traffic along parts of the Alaska, Richardson and Steese Highways (Alaska Journal of Commerce 2022).
- **Graphite One Mine.** Graphite One Inc. is proposing to develop the Graphite One Mine on the Seward Peninsula of Alaska, near Nome, Alaska. The project would mine approximately 4 million tonnes of graphite material annually which would be processed in a plant adjacent to the mine. After initial processing, the graphite concentrate would be shipped to Washington state for secondary processing. Exploratory drilling for the project has been occurring since 2011 and many environmental studies are currently underway. The life of the mine is expected to be 23 years (JDS Energy & Mining Inc.2022).

The BLM acknowledges that other non-physical actions also are likely to influence human uses of land in northwest Alaska. For example, the Central Yukon Field Office currently is working on a new management plan for BLM-managed lands between the Brooks Range and Yukon River, and the Anchorage Field Office is working on a Squirrel River Special Recreation Management Area plan for lands near the lower Kobuk River. Similarly, the National Park Service, U.S. Fish and Wildlife Service, and State of Alaska are likely to update their land management plans over the life of the Ambler Road project, affecting all government lands across the region. While these plans would affect how people may use the lands for recreation, subsistence, hunting and fishing, transportation, and commercial ventures, it is not reasonably foreseeable how land management will change based on those updates at this point in time.

3. Indirect and Cumulative Impacts

3.1. Effects of Reasonably Foreseeable Actions—Applicable to All Alternatives

As described in Section 2.3.3, Other Reasonably Foreseeable Actions, certain future activities would occur regardless of the outcome of the Ambler Road project, including under the No Action Alternative. Table 3-1 presents the 11 RFAs from Section 2.3.3, Other Reasonably Foreseeable Actions, and summarizes their potential impacts on resources in the project area. This includes transient resources in the project area, such as waters that flow through it and caribou that migrate through it.

These are impacts that are assumed to occur under the No Action Alternative and Alternatives A, B, and C. Under the No Action Alternative, these are the primary impacts that would occur, as no road would be built and little to no mine development would be anticipated. Under the action alternatives, these impacts are part of the baseline (along with past and present actions).

Table 3-1. Effect of reasonably foreseeable actions on project area resources for all alternatives

Resource category	North Slope development	Red Dog Mine extension/closure	Climate change	Dalton Highway improvements	Small-scale mineral exploration	OTZ communication towers	Fiber-optic development funding	ANCSA 17(d)(1) Withdrawals EIS	Port of Nome expansion	Port of Alaska modernization	Mahn Choh Mine	Graphite One Mine	Cape Blossom Road
Geology and Soils	No contributing effect in the project area.	No contributing effect in the project area.	Could contribute to permafrost degradation.	May contribute to localized permafrost degradation along the highway.	Could contribute to localized soil disturbance, permafrost degradation, increased erosion and sedimentation, dust deposition, and release of NOA into waterbodies.	Could cause permafrost degradation and increased erosion and sedimentation.	Development projects could cause permafrost degradation and increased erosion and sedimentation.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Sand and Gravel Resources	No contributing effect in the project area.	No contributing effect in the project area.	May require use of sand and gravel resources for construction of response projects.	Requires use of sand and gravel resources for construction.	No contributing effect in the project area.	Requires use of sand and gravel resources for construction.	Development projects would require use of sand and gravel resources for construction.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Hazardous Waste	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	Could result in spills during construction and operation.	Could result in spills near existing airfields and roads in project area.	Could result in spills during construction and operation.	Development projects could result in spills during construction.	Development on revoked withdrawals could increase the risk of spills.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Paleontological Resources	No contributing effect in the project area.	No contributing effect in the project area.	Thawing permafrost would impact resources. Response could include documenting these resources.	Could impact resources from excavation or fill.	Could impact resources from excavation or fill.	Could impact resources from excavation or fill.	Development projects could impact resources from excavation or fill.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Water Resources	Little to no contributing effect in the project area.	No contributing effect in the project area.	Could contribute to changes in hydrology and water quality.	Could impact stream/rivers that continue through the Ambler Road study area.	Could impact water quality, drainage patterns, connectivity, water levels, and velocity.	Little to no contributing effect in the project area.	Little to no contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Air Quality and Climate	Contributes GHG emissions during extraction and during end-use of petroleum products. See Climate Change column.	Closure would contribute slightly to reduction in GHG emissions. No substantial contributing effect in the project area.	Actions that emit GHG could contribute to shorter, milder winters and changing weather patterns.	Could contribute to localized air quality impacts during construction along the Dalton Highway and may attract more traffic, contributing to GHG emissions.	Would contribute to GHG emissions through fossil fuel combustion. See Climate Change column.	Could contribute to localized air quality impacts during construction.	Development projects could contribute to localized air quality impacts during construction.	No contributing effect in the project area.	Contributes GHG emissions during construction. See Climate Change column.	Contributes GHG emissions during construction. See Climate Change column.	Contributes GHG emissions during construction and operation. See Climate Change column.	Contributes GHG emissions during construction and operation. See Climate Change column.	Contributes GHG emissions during construction and operation. See Climate Change column.
Noise	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	Contributes to localized noise impacts during construction along the Dalton Highway.	Contributes to localized and intermittent noise impacts.	Contributes to localized noise impacts during construction.	Development projects could contribute to localized noise impacts during construction	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.

Resource category	North Slope development	Red Dog Mine extension/closure	Climate change	Dalton Highway improvements	Small-scale mineral exploration	OTZ communication towers	Fiber-optic development funding	ANCSA 17(d)(1) Withdrawals EIS	Port of Nome expansion	Port of Alaska modernization	Mahn Choh Mine	Graphite One Mine	Cape Blossom Road
Vegetation and Wetlands	Little or no contributing effect in the project area.	No contributing effect in the project area.	Projects that emit GHG could contribute to changing vegetation communities through increasing temperatures and permafrost thaw.	Highway widening would affect vegetation and wetlands within watersheds that drain through the Ambler Road study area.	Ground disturbing activities could impact vegetation or wetlands and contribute to the introduction and spread of non-native invasive species.	Ground disturbing activities could impact vegetation or wetlands and contribute to the introduction and spread of non-native invasive species.	Ground disturbing activities could impact vegetation or wetlands and contribute to the introduction and spread of non-native invasive species.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Fish and Amphibians	Little or no contributing effect in the project area.	No contributing effect in the project area.	Projects that emit GHG could contribute to changes to hydrology, water quality/temperature, and riparian vegetation, which could contribute to effects on fish.	Could impact fish habitat in streams that continue through the Ambler Road study area.	Could impact fish habitat in streams that run through the Ambler Road study area.	Could impact fish habitat in streams that run through the Ambler Road study area.	Could impact fish habitat in streams that run through the Ambler Road study area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Birds	Little or no contributing effect in the project area.	Little or no contributing effect in the project area.	Projects that emit GHG could contribute to changes to hydrology, water quality, and vegetation, which could contribute to effects on birds and their habitat.	Highway widening would contribute to effects on bird habitat at the eastern edge of the project area.	Aircraft use would impact birds through disturbance, displacement, and direct injury or mortality. Could contribute to habitat loss and fragmentation in project area.	Ground disturbing activities could contribute to habitat loss and fragmentation in project area.	Ground disturbing activities could contribute to habitat loss and fragmentation in project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Mammals	Would increase disturbance and habitat effects on the Western Arctic caribou herd. Additional Dalton Highway traffic could affect caribou travel.	Closure and substantially reduced activity on road could reduce conflicts with and disturbance to the Western Arctic caribou herd.	Projects that emit GHG could contribute to changes to hydrology, water quality, and vegetation, which could contribute to effects on mammals and their habitat.	Construction would reduce wildlife habitat, and activity would disturb animals. Potential increased traffic could affect caribou and other animal movements.	Air traffic could cause disturbance and displacement of caribou.	Construction activities could result in disturbance to mammals and their habitats.	Construction activities could result in disturbance to mammals and their habitats.	Could increase disturbance and habitat effects on the WAH.	No contributing effect in the project area.	No contributing effect in the project area.	Construction would reduce wildlife habitat and operations would disturb animals and result in displacement. Roads and traffic may disrupt animal movements and migrations.	No contributing effect in the project area.	No contributing effect in the project area.
Land Ownership, Management and Special Designations	No contributing effect in the project area.	No contributing effect in the project area.	Little or no contributing effect in the project area.	No contributing effect in the project area.	Could change the demand for industrial land uses associated with mineral development, depending on the outcome of exploration.	No contributing effect in the project area.	No contributing effect in the project area.	Future industrial development may be allowed on revoked lands.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.

Resource category	North Slope development	Red Dog Mine extension/closure	Climate change	Dalton Highway improvements	Small-scale mineral exploration	OTZ communication towers	Fiber-optic development funding	ANCSA 17(d)(1) Withdrawals EIS	Port of Nome expansion	Port of Alaska modernization	Mahn Choh Mine	Graphite One Mine	Cape Blossom Road
Transportation and Access	Would maintain and likely increase traffic levels on the Dalton Highway. ASTAR and oil and gas development could extend industry and public roads across the North Slope Borough.	Closure of mine could reduce traffic levels in regional area.	Would likely make it harder to maintain winter trails. Could make it harder to maintain river navigation. Could result in transportation infrastructure needing more maintenance.	Would contribute to safety and accommodating increased traffic/demand. Construction impacts could contribute to traffic delays.	Would contribute to regional air traffic and Dalton Highway traffic levels.	Improved communication between vehicles and aircraft would result in improved operations and safety in the project corridor.	Development projects would contribute to regional air traffic and/or Dalton Highway traffic levels.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	Would increase heavy truck traffic on the Steese Highway between the Elliott Highway and Fairbanks.	No contributing effect in the project area.	No contributing effect in the project area.
Recreation and Tourism	Increased industrial traffic and increased recreation/tourism traffic could conflict on Dalton Highway, Elliot Highway, and Steese Highway.	No contributing effect in the project area.	No contributing effect in the project area.	Would contribute to safety and to accommodating increased traffic/demand.	Would contribute to ongoing visual and noise impacts for recreationists and tourists.	Construction activities could result in traffic, visual, and noise impacts for recreationists and tourists.	Construction activities could result in traffic, visual, and noise impacts for recreationists and tourists.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Visual Resources	Little contributing effect in the project area. A new parallel pipeline could add to industrial character of Dalton Highway corridor.	No contributing effect in the project area.	Projects that emit GHG could contribute to vegetation changes over time; minor visual effects.	Would contribute minor visual changes.	Would contribute minor visual changes.	Would contribute minor visual changes.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.	No contributing effect in the project area.
Socioeconomics and Communities	Could increase job options in the region or forestall oil job losses. Could contribute to poorer health in communities if subsistence caribou harvest affected.	Closure would reduce regional employment. Reduction in jobs in the project area could reduce food security in local communities.	Thawing permafrost, reduced ice, changes in subsistence resource availability, and rising water levels could undermine community infrastructure, change winter transportation, affect public health, and require cultural adaptation. Response projects could inject funding/jobs into communities.	Construction may offer some job opportunities in the region.	Little contributing effect in the project area.	Construction may offer some job opportunities in the region. Improved communications systems would benefit local communities.	Construction may offer some job opportunities in the region. Improved utility systems would benefit local communities.	Little contributing effect in the project area.	Construction may offer some job opportunities in the region.	Construction may offer some job opportunities in the region.	Would alter job availability and level of economic activity in the project area.	Would alter job availability and level of economic activity in the project area.	Construction may offer some job opportunities in the region.

Ambler Road Draft Supplemental EIS
Appendix H. Indirect and Cumulative Scenarios

Resource category	North Slope development	Red Dog Mine extension/closure	Climate change	Dalton Highway improvements	Small-scale mineral exploration	OTZ communication towers	Fiber-optic development funding	ANCSA 17(d)(1) Withdrawals EIS	Port of Nome expansion	Port of Alaska modernization	Mahn Choh Mine	Graphite One Mine	Cape Blossom Road
Environmental Justice	Could increase jobs for EJ communities, or forestall job losses.	Extension would extend jobs, and closure would reduce jobs in the region, affecting EJ communities.	Climate changes, rising water levels, changes in subsistence resource availability, and permafrost/ice cover changes affect EJ communities.	Little contributing effect in the project area.	Effects of air exploration on subsistence uses and resources would have continued effects on EJ populations.	Improved communications systems would benefit local EJ communities. Construction activities could result in temporary beneficial (i.e., jobs) or adverse (i.e., disturbance to subsistence resources and uses) effects.	Improved utility systems would benefit local EJ communities. Construction activities could result in temporary beneficial (i.e., jobs) or adverse (i.e., disturbance to subsistence resources and uses) effects.	Little contributing effect in the project area.	Little contributing effect in the project area.	Little contributing effect in the project area.	Little contributing effect in the project area.	Little to no contributing effect in the project area.	Little to no contributing effect in the project area.
Subsistence Uses and Resources	Could affect caribou movements, which in turn could affect availability caribou for harvest.	Closure would reduce conflicts with and disturbance to the Western Arctic caribou herd.	Projects that emit GHG could contribute to vegetation and climate changes that could affect availability of and access to berries, wood, and game. Effects on subsistence could affect public health in project area communities.	Minor changes to an existing road would not have substantial new effects on subsistence.	Air traffic could cause disturbance to subsistence uses and resources such as caribou and hunting.	Construction activities and presence of new infrastructure may affect subsistence uses and resources.	Construction activities may affect subsistence uses and resources.	Could result in changes in subsistence management including the loss of Federal subsistence priority for residents in the project area.	Little contributing effect in the project area.	Little contributing effect in the project area.	No contributing effect in the project area.	Little to no contributing effect in the project area.	Little to no contributing effect in the project area.
Cultural Resources	Construction and presence of new infrastructure could affect cultural resources directly or indirectly.	Closure would have no additional impacts, whereas extension could affect cultural resources directly or indirectly.	Projects that emit GHG could contribute to thawing permafrost, which can impact resources (e.g., through increased stream bank erosion).	Construction could affect cultural resources, including the NRHP-eligible Dalton Highway itself.	Air traffic could affect cultural resources indirectly (i.e., audio/visual effects).	Construction and presence of new infrastructure could affect cultural resources directly or indirectly.	Construction could affect cultural resources directly or indirectly.	Could result in fewer regulatory protections for cultural resources resulting in increased impacts to resources in those areas.	No contributing effect in the project area.	No contributing effect in the project area.	Construction and operation could affect cultural resources directly or indirectly.	No contributing effect in the project area.	No contributing effect in the project area.

Note: EJ = Environmental Justice; GHG = greenhouse gas; NOA = naturally occurring asbestos; WAH = Western Arctic Caribou Herd.

3.2. No Action Alternative*

Under the No Action Alternative, an access road to provide transportation to the District would not be provided. Without the access road, it is assumed that there would be no major induced development of the mines in the District, so there would be little to no beneficial or adverse impacts from mining. While the District contains sizable deposits for development, the lack of a road makes development of mines cost-prohibitive. Under the No Action Alternative, exploration of the deposits and additional staking of claims would continue as possible alternatives to the proposed road were evaluated.

Cumulative impact is the incremental impact of an action when combined with other past, present, and reasonably foreseeable future actions. Since no road would be built under the No Action Alternative, there would be no incremental impact to accumulate with other impacts. However, the impacts of the RFAs outlined in Table 3-1 would occur.

Table 3-1 is essentially a no-action analysis, describing effects expected to occur even if the BLM decided not to issue a ROW authorization for the Ambler Road. As noted in the table, many of the RFAs would likely result in little or no effect in the Ambler Road project area. Actions that affect climate change or in response to a changing climate would be most likely to continue to affect conditions in the study area. Actions to improve the Dalton Highway corridor likely would be an ongoing series of projects that would incrementally use relatively scarce area resources (gravel) and eliminate or change relatively small additional amounts of vegetation, wetlands, and watercourses that serve as habitats (e.g., when highway curves were realigned).

Some specific and potentially prominent impacts could affect caribou, subsistence, and socioeconomics. The synergistic effects of arctic development, Dalton Highway additions, climate change actions, and Red Dog Mine changes could affect caribou calving and wintering grounds, the caribou life cycle, and movement patterns of caribou, potentially threatening the population or altering access to and use of caribou as a subsistence resource. Arctic development and extension of the Red Dog Mine could provide a steady supply of relatively high-paying jobs, some of which likely would be taken by residents of the Ambler Road study area. Eventual closure of the Red Dog Mine and likely closure of some oil fields on the North Slope would reduce such jobs. The closure of Red Dog Mine, in particular, would affect residents of the western part of the Ambler Road project area. This is because the Red Dog Mine is on NANA land and provides substantial employment assurances to NANA shareholders and pays the corporation a steady annual income that has been used to improve villages in the region. The mine also makes substantial payments in lieu of taxes to the NAB that have benefited the people of the region. Neither the village improvement funds nor the payments in lieu of taxes would occur after mine closure, which could result in loss of substantial funds to the region. Table 3-1 provides information about effects in other resource categories.

3.3. Action Alternatives*

Additional analysis of indirect and cumulative effects for the action alternatives are included in Chapter 3 of the Supplemental EIS, under the sections titled Mining, Access, and Other Indirect and Cumulative Impacts within each resource analysis. These sections describe how the Ambler Road project's action alternatives would add to or change the effects noted in Table 3-1 that are expected to occur under the No Action Alternative and includes the mining actions and community access actions induced by the opening of the Ambler Road. Together, the impacts of these past, present, and RFAs and the incremental additional impacts of the road are the cumulative impacts of Alternatives A, B, and C. While the effects of past actions are known, the RFAs are principally not formal proposals at this time, so the cumulative

and indirect analysis in Chapter 3 of the Supplemental EIS is necessarily based on reasonably foreseeable scenarios and not on detailed plans or proposals.

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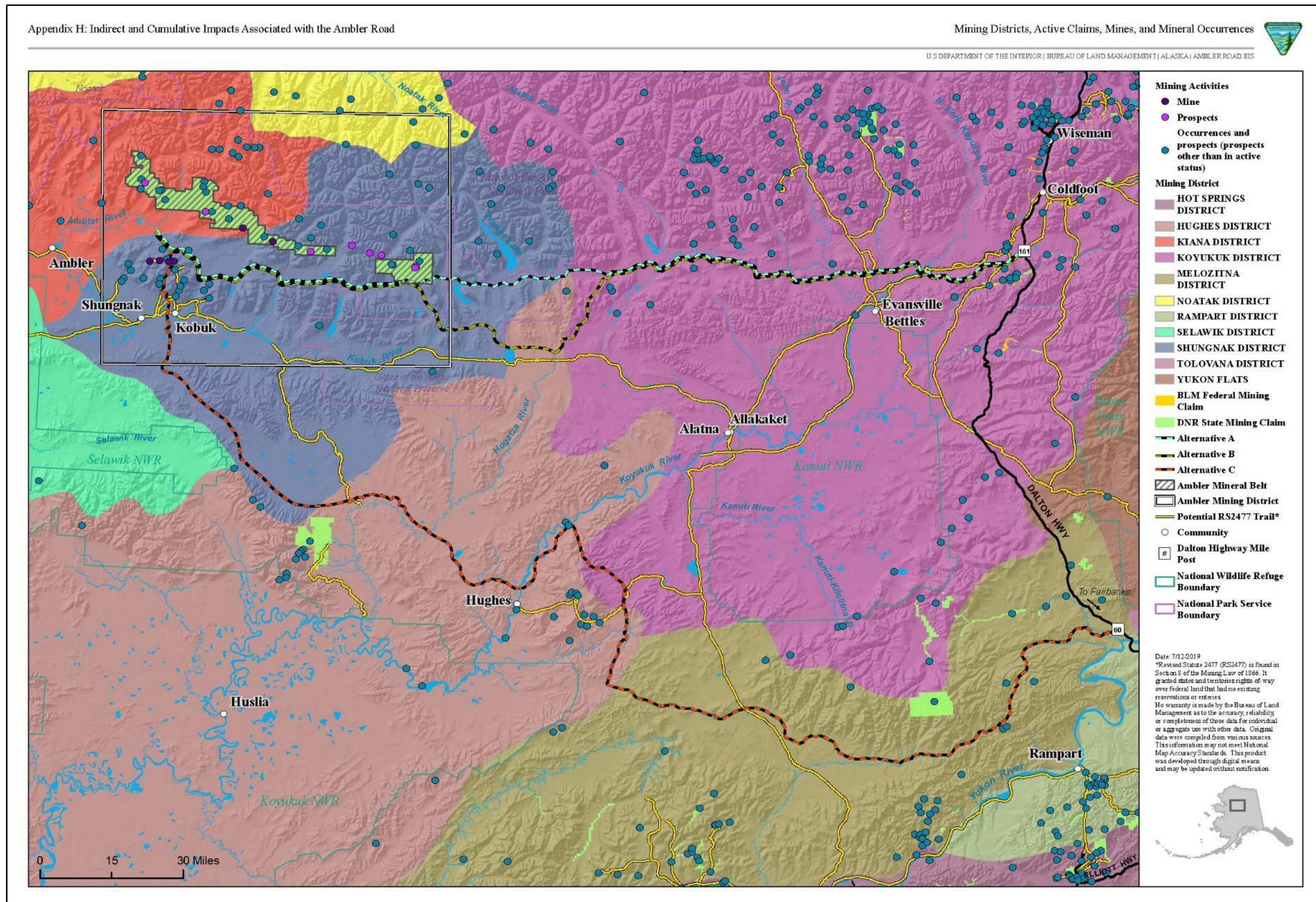
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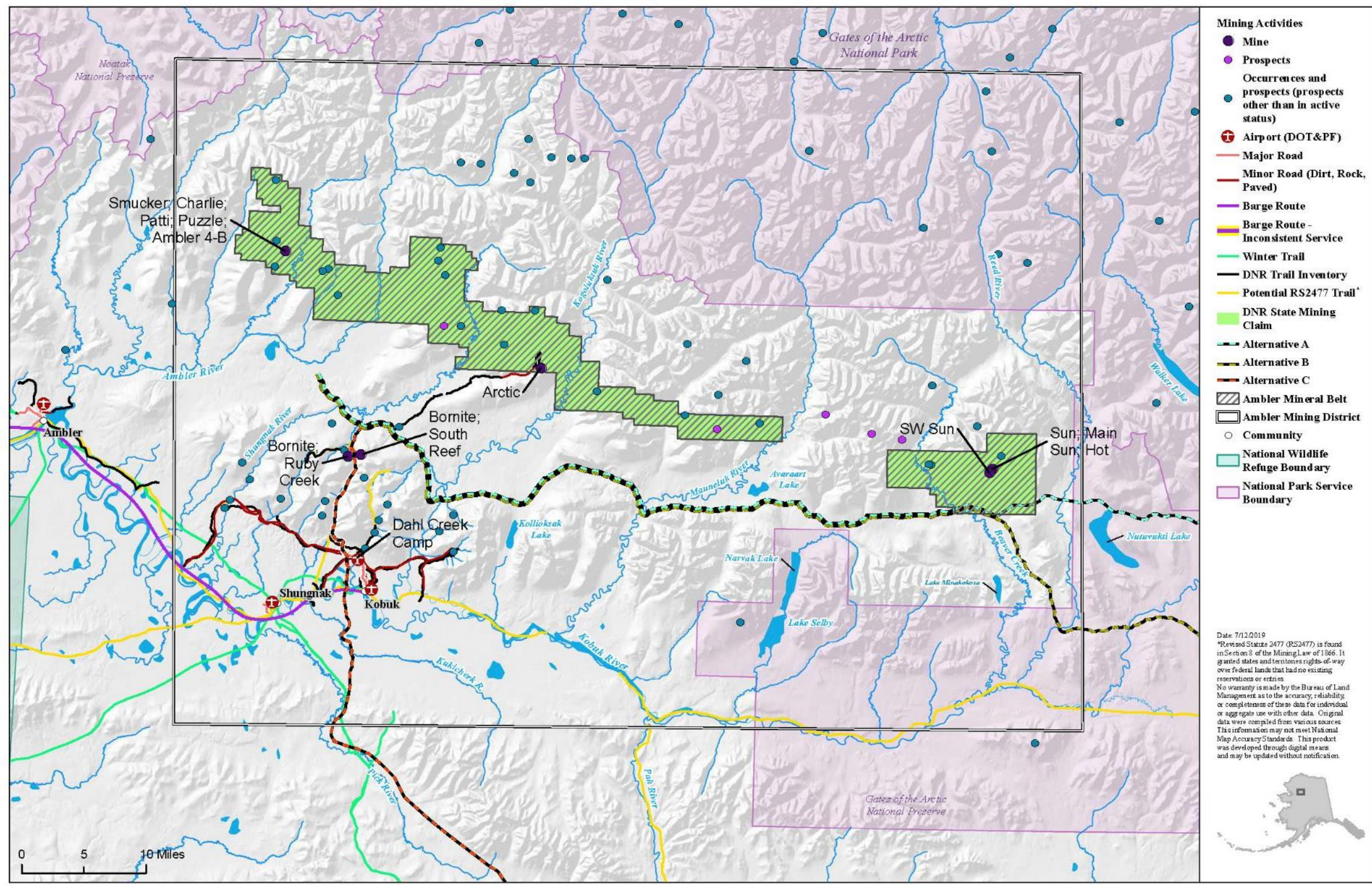
Maps

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Map 1. Mining districts, active claims, mines, and mineral occurrences

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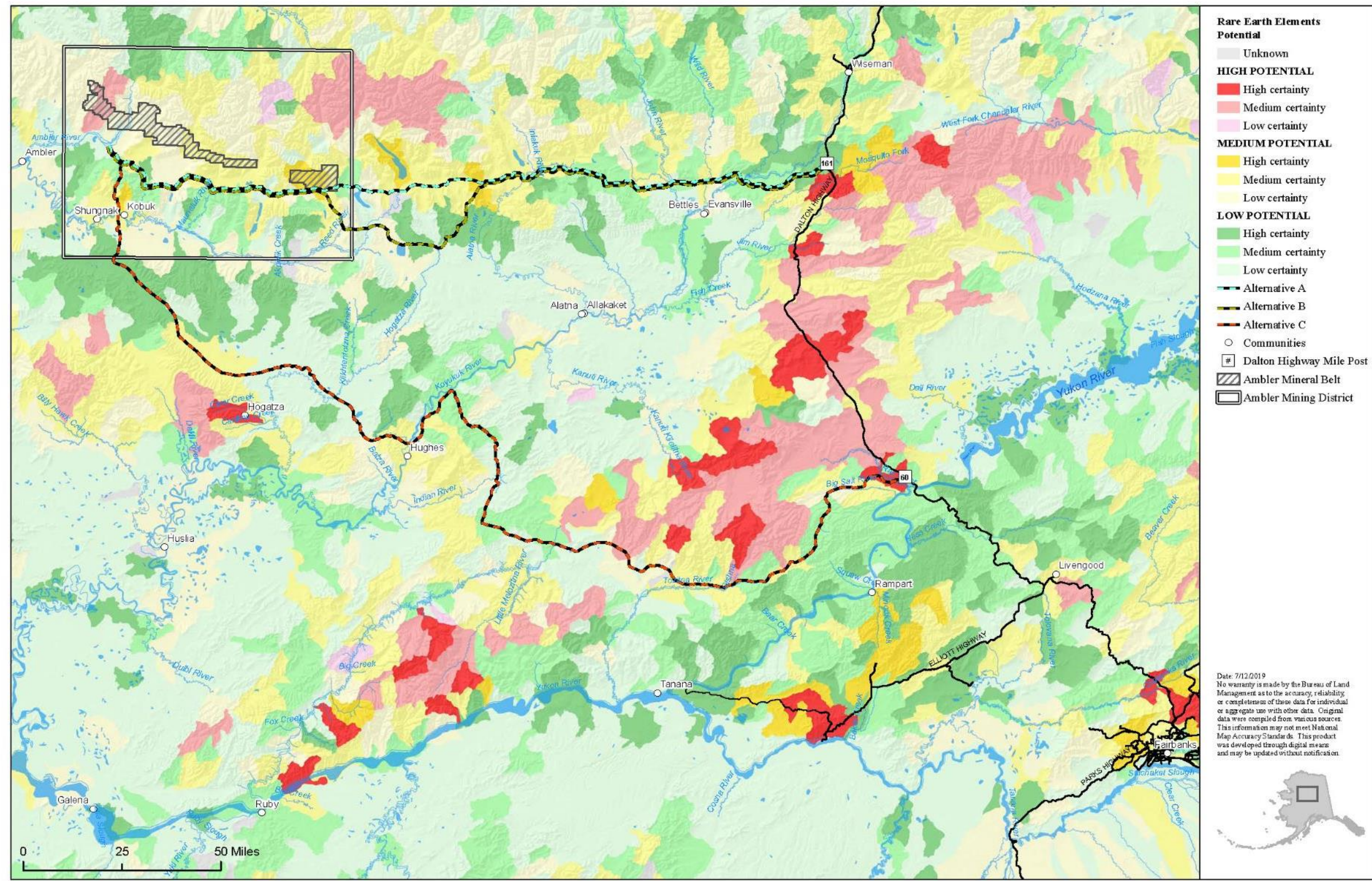
Map 2. Hypothetical baseline development scenario – location of the 4 mine development projects*

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Appendix H: Indirect and Cumulative Impacts Associated with the Ambler Road

Resource Potential for Rare Earth Elements

U.S. DEPARTMENT OF THE INTERIOR | BUREAU OF LAND MANAGEMENT | ALASKA | AMBLER ROAD EIS



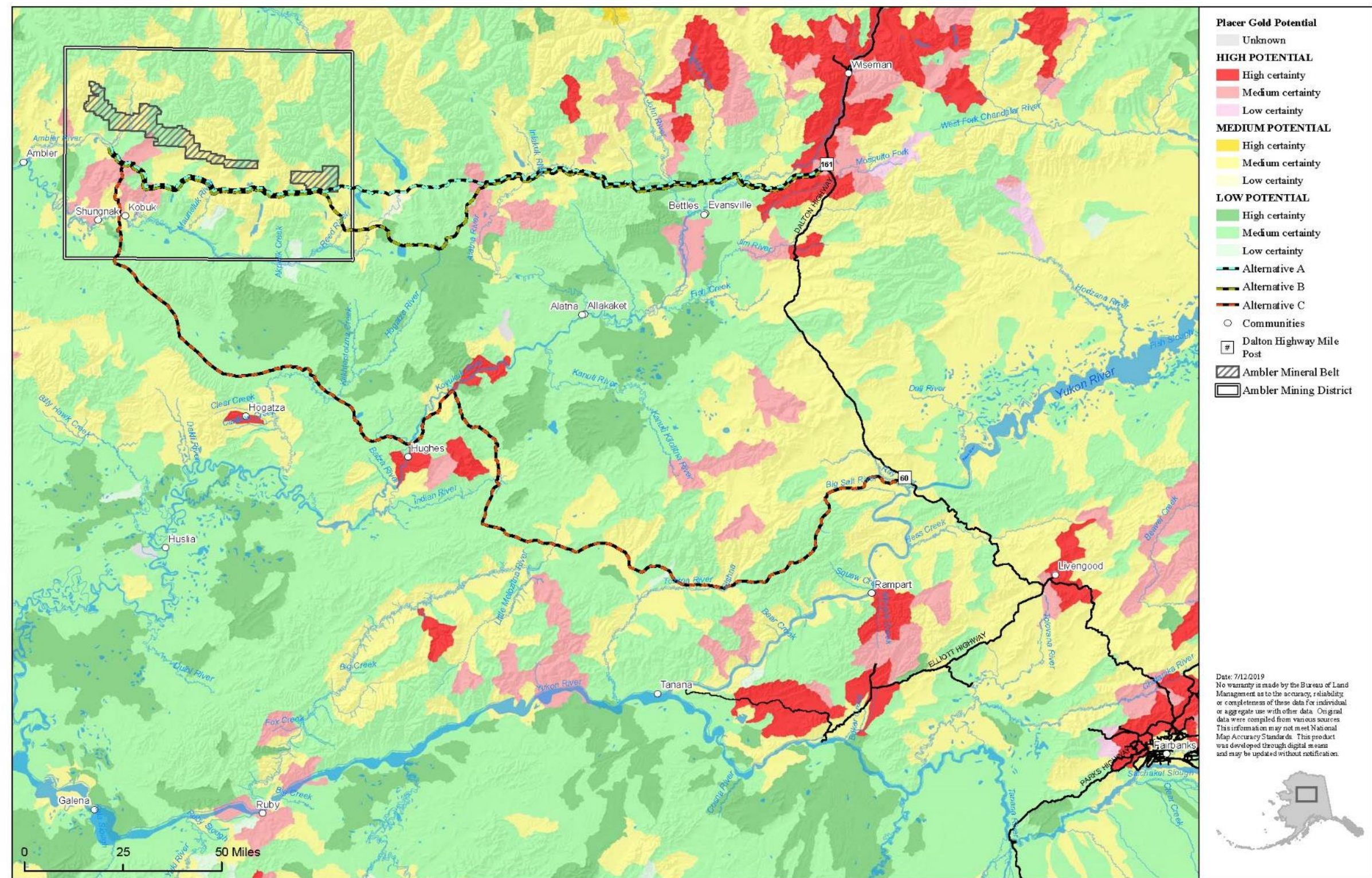
Map 3. Resource potential for rare earth elements

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Appendix H: Indirect and Cumulative Impacts Associated with the Ambler Road

Resource Potential for Placer and Paleoplacer Gold

U.S. DEPARTMENT OF THE INTERIOR | BUREAU OF LAND MANAGEMENT | ALASKA | AMBLER ROAD EIS



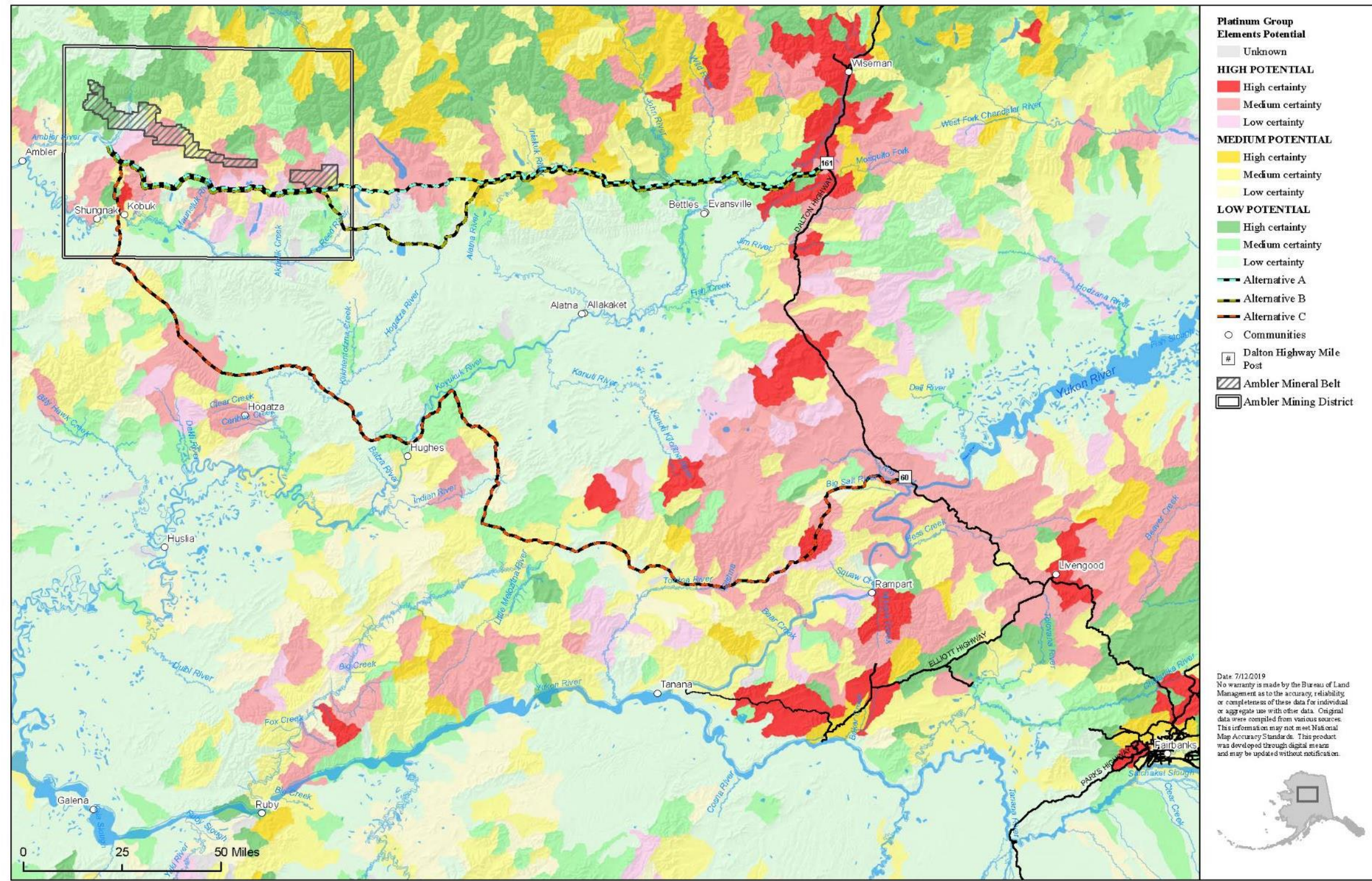
Map 4. Resource potential for placer and paleoplacer gold

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Appendix H: Indirect and Cumulative Impacts Associated with the Ambler Road

Resource Potential for Platinum Group Elements

U.S. DEPARTMENT OF THE INTERIOR | BUREAU OF LAND MANAGEMENT | ALASKA | AMBLER ROAD EIS



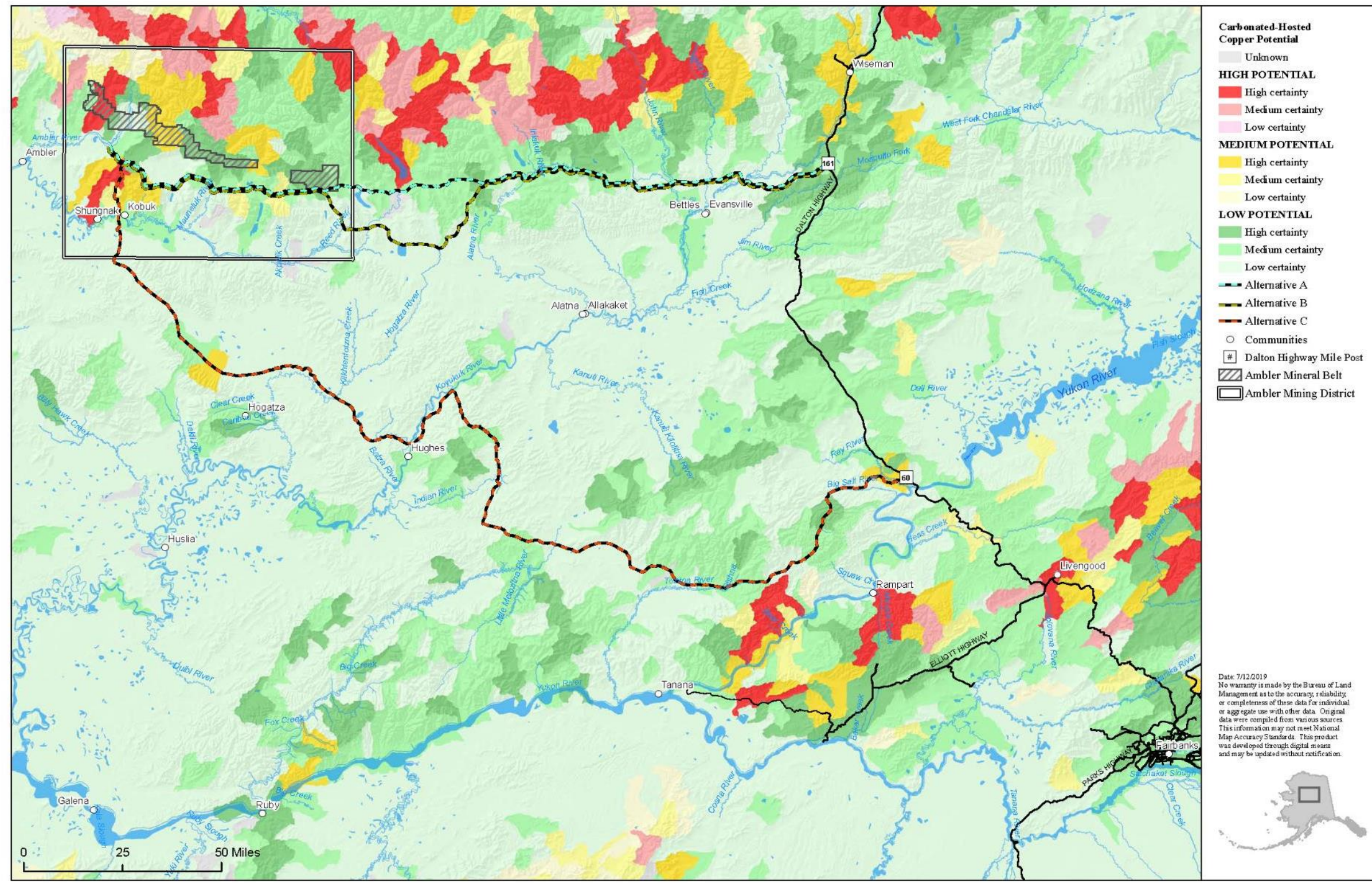
Map 5. Resource potential for platinum group elements

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Appendix H: Indirect and Cumulative Impacts Associated with the Ambler Road

Resource Potential for Carbonated-Hosted Copper

U.S. DEPARTMENT OF THE INTERIOR | BUREAU OF LAND MANAGEMENT | ALASKA | AMBLER ROAD EIS



Map 6. Resource potential for carbonated-hosted copper

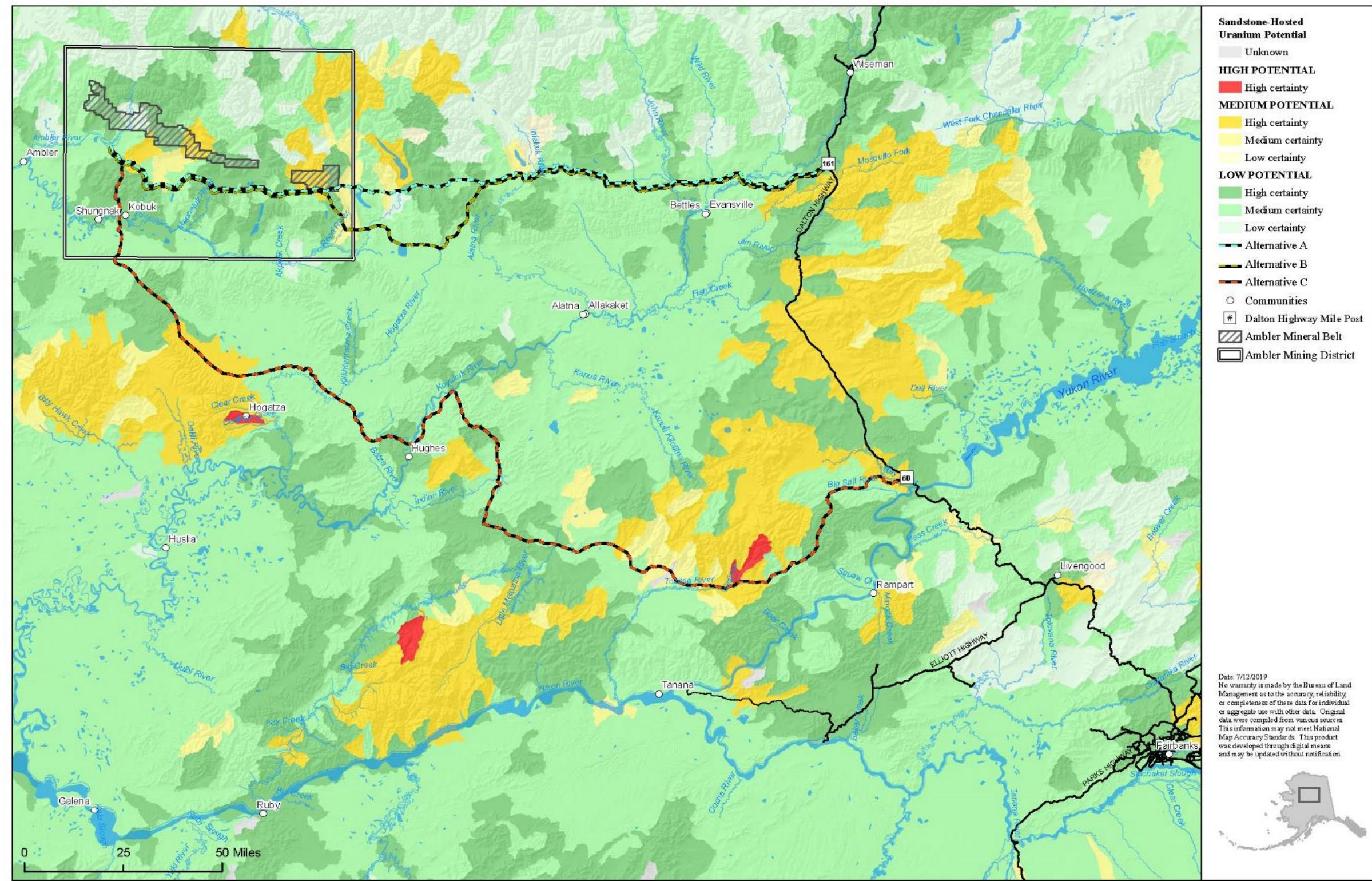
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Appendix H: Indirect and Cumulative Impacts Associated with the Ambler Road

Resource Potential for Sandstone-Hosted Uranium



U.S. DEPARTMENT OF THE INTERIOR | BUREAU OF LAND MANAGEMENT | ALASKA | AMBLER ROAD EIS



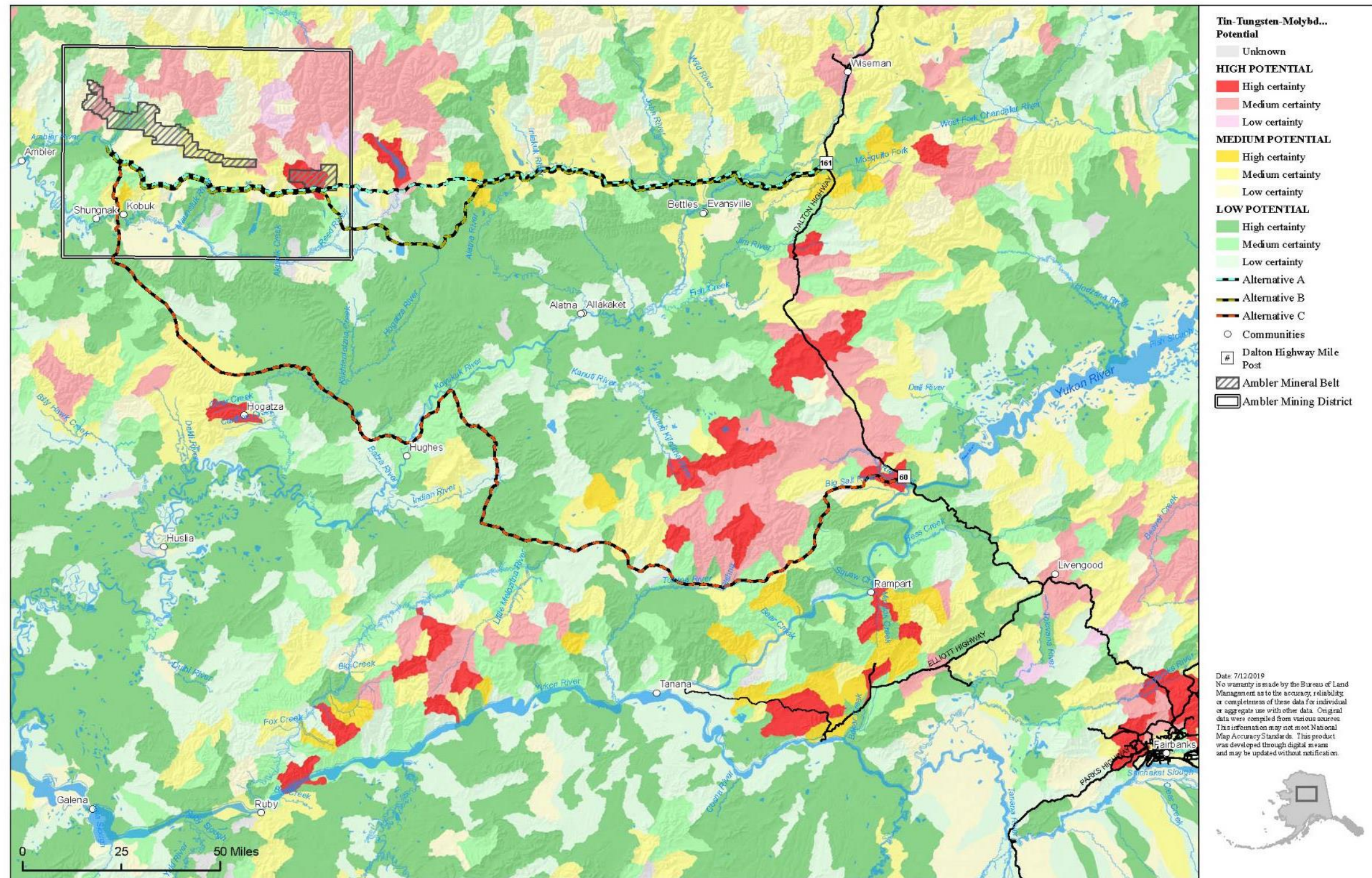
Map 7. Resource potential for sandstone-hosted uranium

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Appendix H: Indirect and Cumulative Impacts Associated with the Ambler Road

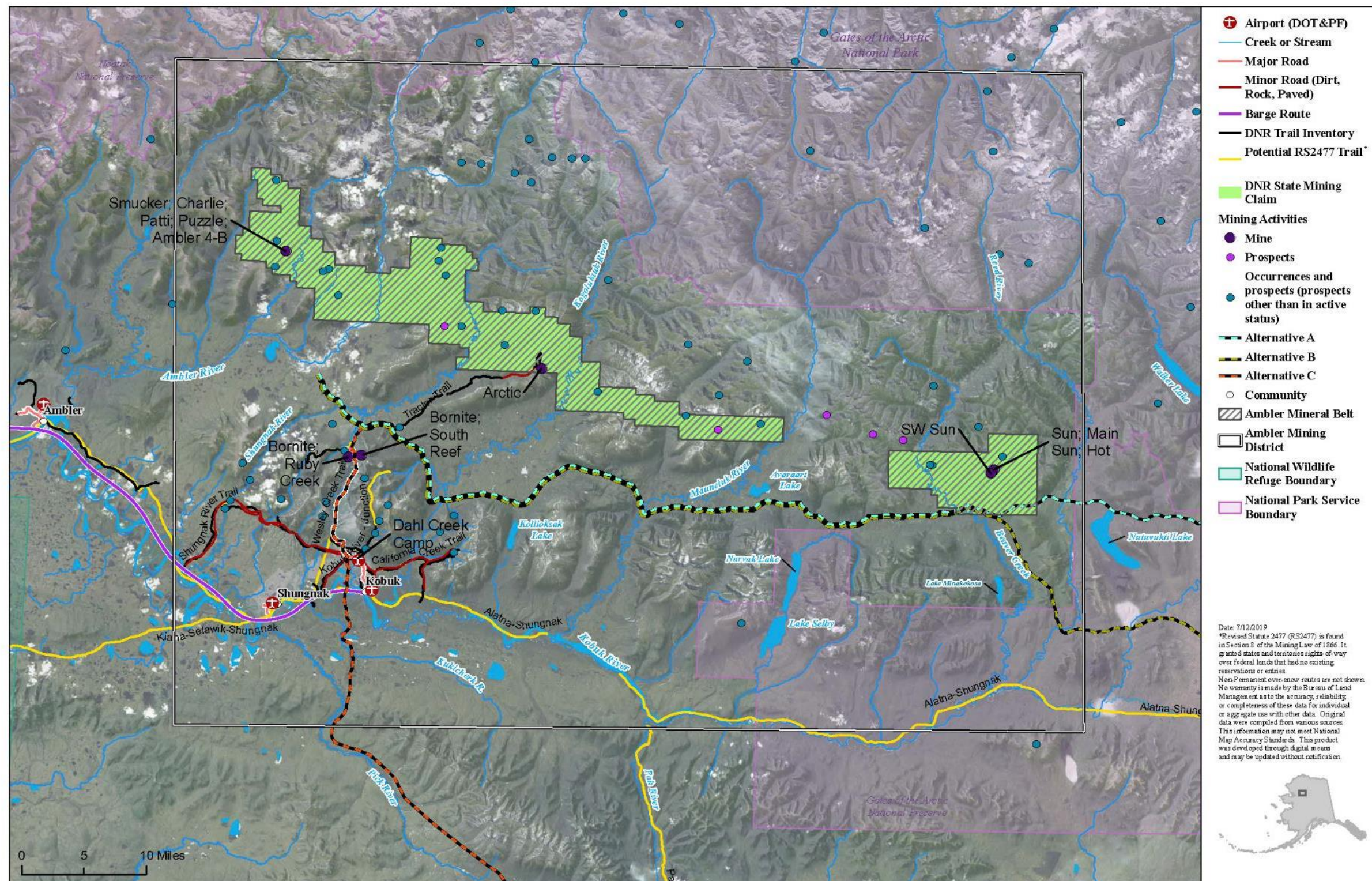
Resource Potential for Tin-Tungsten-Molybdenum

U.S. DEPARTMENT OF THE INTERIOR | BUREAU OF LAND MANAGEMENT | ALASKA | AMBLER ROAD EIS



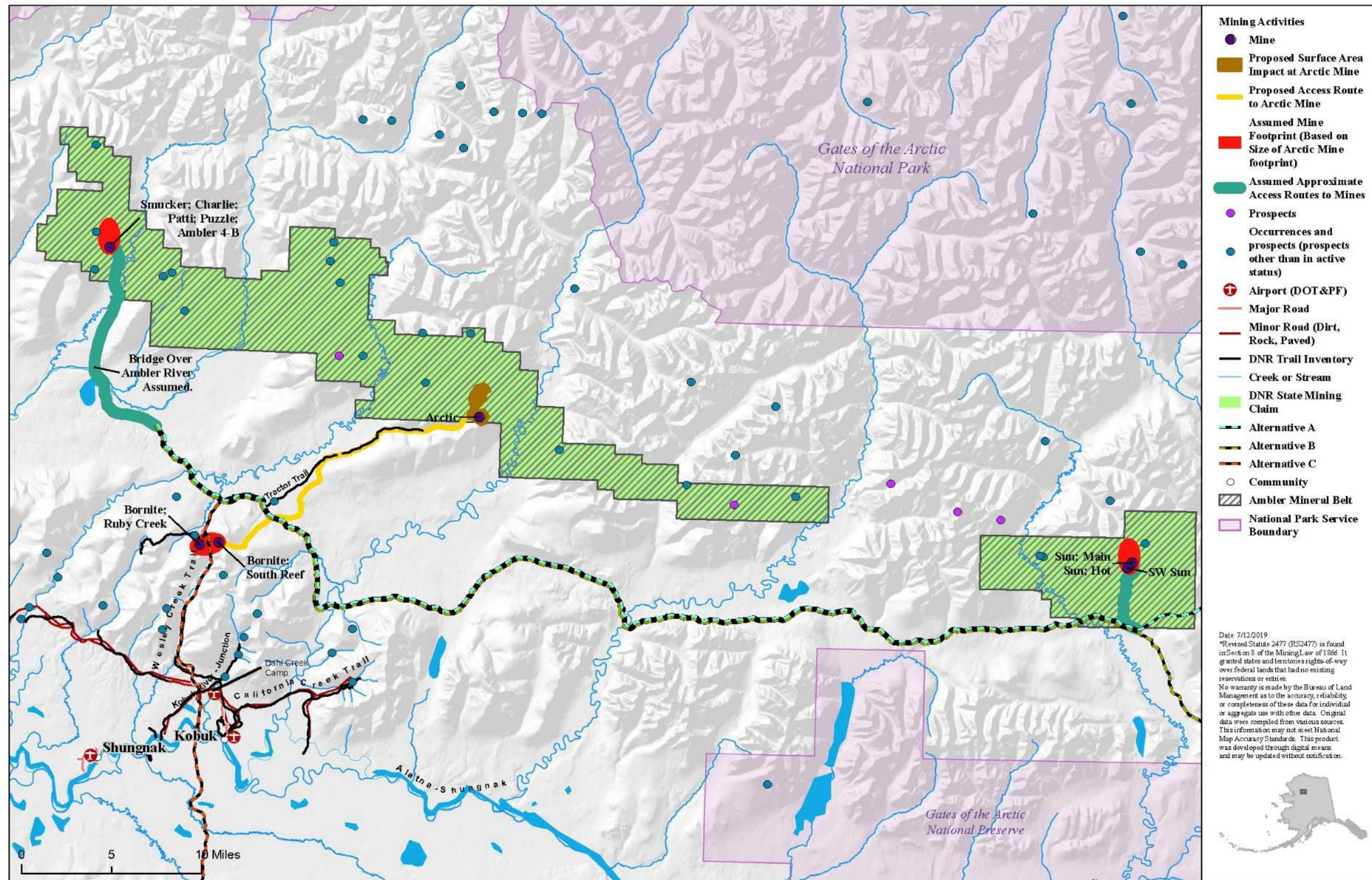
Map 8. Resource potential for tin-tungsten-molybdenum

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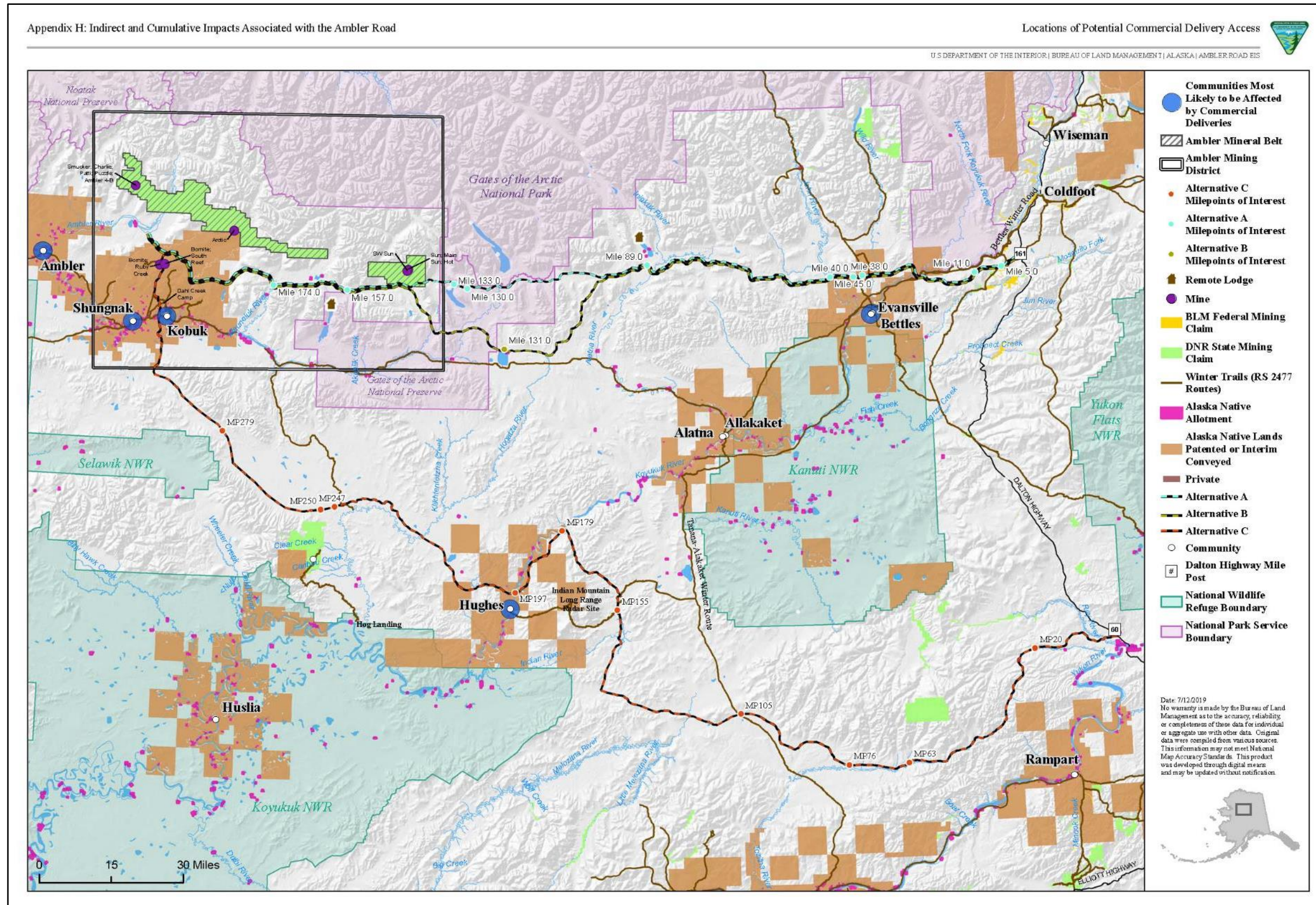
Map 9. Ambler Mining District existing transportation network

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Map 10. Hypothetical baseline development scenario – future transportation and mine development

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Map 11. Locations of potential commercial delivery access

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Appendix I. Preparers, Consultation and Collaboration

Note: This entire Appendix has been revised from the previous version and replaced with new content that is specific to the Supplemental EIS process only. Therefore, none of the text has been highlighted to indicate new or substantially revised text.

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1. Preparers

Table 1 is a list of team members involved in the preparation of this Supplemental Environmental Impact Statement (EIS), the organizations where they work, and their roles in its development.

Table 1. List of preparers

Organization	Name	Role
BLM	Geoff Beyersdorf	Authorized Officer
BLM	Stacie McIntosh	Project Manager
BLM	Serena Sweet	Alaska State Office Planning; EIS Oversight
BLM	Bill Hedman	Quality Control/Quality Assurance, Mitigation
BLM	Sheri Wilson	Land Use/Land Management
BLM	Cindy Hamfler	Geographic Information Systems
BLM	Erin Julianus	Subsistence Uses and Resources, Terrestrial Mammals, ANILCA Section 810 Evaluation
BLM	Noel Turner	Water Resources, Hydrology, Wetlands
BLM	John Barefoot	Geology and Minerals
BLM	Dougless Skinner	Cultural Resources, National Historic Preservation Act Section 106
BLM	Crystal Glassburn	Paleontological Resources
BLM	Jessica Tighe	Hazardous Materials
BLM	David Esse	Fish and Aquatic Species, ANILCA Section 810 Evaluation
BLM	Willie Branson	Fire Management
BLM	Steve Taylor	Recreation and Tourism, Visual Resources, Wilderness Characteristics Wild and Scenic Rivers
BLM	Garrett Jones	Recreation and Tourism, Travel Management
BLM	Martin Maricle	Realty, Consultation
BLM	VJ Maisonet-Montanez	Air Quality
BLM	Stewart Allen	Socioeconomics
BLM	Teri Balsler	Public Affairs
SWCA	Chad Ricklefs	Project Manager
SWCA	Brittany Sahatjian	Assistant Project Manager
SWCA	Julia Aaronson	Project Coordinator
SWCA	Matt Peterson	Alternatives Facilitator
SWCA	Catherine Chatfield	Geographic Information Systems
SWCA	Amanda Childs	Quality Assurance/Quality Control, Realty/Non-Renewable Resources Team Lead
SWCA	Linda Tucker Burfitt	Publication and Section 508 Specialist
SWCA	Kelcie Witzens	Publication and Section 508 Specialist
SWCA	Diane Bush	Technical Editor
SWCA	Stephanie Graham	Natural/Renewable Resources Team Lead
SWCA	Karen Lange	Administrative Record/Decision File Specialist
SWCA	Matt Westover	Comment Analysis and Response Specialist

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Organization	Name	Role
SWCA	Brad Sohm	Air Quality, Noise, Climate Change
SWCA	Ariana Porter	Wildland Fire Ecology, Forestry and Woodland Products
SWCA	Rachel Carlson	Wildland Fire Ecology, Forestry and Woodland Products
SWCA	Kelly Beck	Cultural and Historic Resources, Tribal Consultation
SWCA	Georgia Knauss	Paleontological Resources
SWCA	Matthew Harper	Outdoor Recreation, Travel Management
SWCA	Emma Clinton	Outdoor Recreation, Travel Management
SWCA	Kevin Rauhe	Visual Resources
SWCA	Matthew Robinson	Visual Resources
SWCA	Brooke Crockett	Realty/Special Designations
NEI	Leah Cuyno	Socioeconomics Lead
NEI	Don Schug	Environmental Justice Lead
NEI	Melissa Errend	Socioeconomics, Environmental Justice
SRBA	Stephen Braund	Subsistence, ANILCA 810 Evaluation, Cultural Resources Lead
SRBA	Liz Sears	Subsistence, ANILCA 810 Evaluation
SRBA	Paul Lawrence	Cultural and Paleontological Resources, Subsistence, ANILCA 810 Evaluation, Tribal Consultation
SRBA	Randy Tedor	Cultural and Historic Resources, Tribal Consultation
ABR, Inc.	Alex Prichard	Wildlife, Special Status Species Lead
ABR, Inc.	Wendy Davis	Vegetation, Special Status Plants, Non-Native Plant Species, Landscape Ecology
ABR, Inc.	John Seigle	Fish and Aquatic Species
ABR, Inc.	Rebecca McGuire	Birds/Avian Species Lead
ABR, Inc.	Lauren Attanas	Birds/Avian Species
DOWL	Keri Nutter	Soils, Geology, Permafrost, Locatable Minerals, Mineral Materials Lead
DOWL	Paul Pribyl	Soils, Geology, Permafrost, Locatable Mineral, Mineral Materilas
DOWL	Rich Pribyl	Water Resources Lead
DOWL	Dana Brunswick	Water Resources
DOWL	Adam Morrill	Hazardous Materials Lead

Note: ANILCA = Alaska National Interest Lands Conservation Act; BLM = Bureau of Land Management; NEI = Northern Economics, Inc.; SRBA = Stephen R. Braund & Associates.

2. Government-to-Government Consultation

Table 2 presents the dates, locations, and attending agencies and other entities involved in government-to-government consultation meetings associated with the Supplemental EIS and Section 106.

Table 2. Government-to-government consultation meetings

Date	Location	Attendance
June 8, 2022	Allakaket	Allakaket Traditional Council, BLM
June 9, 2022	Alatna	Alatna Tribal Council

Date	Location	Attendance
July 7, 2022	Hughes	Hughes Village Council, BLM
July 21, 2022	Evansville	Evansville Village Council, BLM
October 14, 2022	Kobuk	Native Village of Kobuk, BLM
November 22, 2022	Huslia	Huslia Tribal Council, BLM
January 19, 2023	Alatna	Alatna Tribal Council, BLM
January 20, 2023	Allakaket	Allakaket Traditional Council, BLM
March 1, 2023	Evansville	Evansville Village Council, BLM
April 25, 2023	Shungnak	Native Village of Shungnak, BLM
April 26, 2023	Noorvik	Noorvik Native Community, BLM
April 27, 2023	Kiana	Native Village of Kiana, BLM
April 27, 2023	Kotzebue	Native Village or Kotzebue, BLM
April 28, 2023	Noatak	Native Village of Noatak, BLM
May 4, 2023	Anaktuvuk Pass	Naqsragmiut Tribal Council, BLM

Note: BLM = Bureau of Land Management.

3. Section 106

Upon completion of the original EIS process with the release of the Ambler Road Project Joint Record of Decision (July 2020), the National Historic Preservation Act Section 106 process continued, guided by the requirements of the Section 106 Programmatic Agreement (PA). Consultation pursuant to the PA includes both individual meetings, as well as ongoing, recurring meetings that provide the opportunity to address immediate issues or questions related to implementation of the PA.

Table 3 presents the dates, locations, and attending agencies and other entities involved in Section 106 consultation meetings that have occurred since July 2020.

Table 3. Section 106 individual meetings

Date	Location	Attendance
November 18, 2020	Virtual	ACHP, AIDEA/DOWL; ALTC, ATC; BLM; Dinyea Corp; Doyon, EVC; HUTC; NANA; KTC; NWAB; NPS; TCC; USACE
March 21, 2021	Virtual	ACHP, ATC, ALTC, ADNR, AIDEA/DOWL, BLM, Doyon, EVC, HTC, HUTC, NANA, NNC, NWAB, NPS, NVS, SHPO, TCC, USACE
April 16, 2021	Virtual	TCC, BLM
July 30, 2021	Virtual	TCC, ALTC, ATC EVC, HUTC, BLM
November 10, 2021	Virtual	BLM, AIDEA/DOWL, NLURA, NPS, SHPO, ACHP, USACE
December 30, 2021	Virtual	TCC, BLM
February 25, 2022	Virtual	TCC, BLM
April 28, 2022	Fairbanks and via phone	ACHP, ADNR, AIDEA, ATC, BLM, City of Ambler, City of Shungnak, Doyon, HUTC, NANA, NPS, NVA, NWAB, SHPO, TCC, USACE
July 15, 2022	Virtual	NANA, BLM
October 18, 2022	Virtual	NANA, BLM

Date	Location	Attendance
November 9, 2022	Virtual	ACHP, ADNR, AIDEA, BLM, NPS, SHPO
November 15, 2022	Virtual	ACHP, ADNR, AIDEA, BLM, NPS, SHPO
March 24, 2023	Fairbanks and virtual	ACHP, ADNR, AIDEA, ALTC, BLM, NVA, NPS, SHPO
March 28, 2023	Fairbanks and virtual	ACHP, ADNR, AIDEA, ALTC, ATC, EVC, NANA, NVA, NVK, NPS, SHPO, TCC, USACE
May 14, 2023	Anchorage	AIDEA, BLM, SHPO
May 24, 2023	Anchorage	AIDEA, BLM, NPS, SHPO

Note: ACHP = Advisory Council on Historic Preservation; ADNR = Alaska Department of Natural Resources; AIDEA = Alaska Industrial Development and Export Authority; ALTC = Alutna Tribal Council, ATC = Allakaket Tribal Council; BLM = Bureau of Land Management; EVC = Evansville Village Council; HTC = Hughes Traditional Council; HUTC = Huslia Tribal Council; KTC = Kobuk Traditional Council; NAB = Northwest Arctic Borough; NANA = NANA Native Corporation; NLURA = Northern Land Use Research Alaska; NNC = Noorvik Native Community; NPS = National Park Service; NVA = Native Village of Ambler; NVS = Native Village of Shungnak; SHPO = State Historic Preservation Officer; TCC = Tanana Chiefs Conference; USACE = U.S. Army Corps of Engineers.

Table 4 presents the information regarding the regularly recurring meetings held to assist with implementation of the PA.

Table 4. Section 106 recurring meetings

Frequency	Location	Purpose/Attendance
Weekly	Virtual	AWP technical expertise meetings to discuss cultural resource survey methods, process, and deliverables. NLURA, BLM, NPS, SHPO
Biweekly	Fairbanks and Virtual	AIDEA meeting to discuss PA requirements and implementation including project, fieldwork, and deliverables. AIDEA, BLM, contractors
Biweekly	Fairbanks and Virtual	Interagency coordination meeting to keep federal partners updated regarding Section 106 implementation. BLM, NPS, USACE
Monthly	Virtual	NANA meeting (began January 2023) to provide project updates and inform them of consultation efforts occurring within the NANA region.
Quarterly	Fairbanks	Doyon meeting (began in 2022) to provide project updates and inform them of consultation efforts occurring within the Doyon region.
Quarterly	Fairbanks	TCC meetings (began July 2023) to provide project updates and inform them of consultation efforts occurring within the TCC region.

Note: ACHP = Advisory Council on Historic Preservation; AIDEA = Alaska Industrial Development and Export Authority; BLM = Bureau of Land Management; NANA = NANA Native Corporation; NLURA = Northern Land Use Research Alaska; NPS = National Park Service; SHPO = State Historic Preservation Officer; TCC = Tanana Chiefs Conference; USACE = U.S. Army Corps of Engineers

4. Cooperating Agencies

The CEQ regulations implementing National Environmental Policy Act (NEPA) govern the cooperating agency relationship for all federal agencies preparing EISs. The relationship is distinctive, moving beyond consultation to engage officials and staff of other agencies and levels of government in working partnerships. Cooperating agencies share skills and resources to help shape BLM environmental analyses that better reflect the policies, needs, and conditions of their jurisdictions and the citizens they represent. State agencies, local governments, Tribal governments, and other federal agencies may serve as cooperating agencies when they have federal authorization decisions that require compliance with NEPA and/or they have special expertise.

The following are cooperating agencies for the Ambler Road Supplemental EIS:

U.S. Army Corps of Engineers (USACE). The USACE has jurisdiction over activities that would include the discharge of dredge or fill material into waters of the United States, including wetlands (as regulated under the Clean Water Act Section 404), and work or structures constructed in, on, over, or under navigable waters (as regulated under the Rivers and Harbors Act Section 10).

U.S. Fish and Wildlife Service (USFWS). The USFWS is participating as a cooperating agency due to the agency's expertise related to fish and wildlife.

U.S. Environmental Protection Agency (EPA). The EPA is a cooperating agency to maximize use of available resources and special expertise, and minimize duplication in those areas of overlapping responsibilities.

State of Alaska. The Alaska Department of Natural Resources (ADNR) Office of Project Management and Permitting is serving as the lead state agency to coordinate input from other state agencies, including the Alaska Department of Environmental Conservation (ADEC); Alaska Department of Fish and Game (ADF&G); Alaska Department of Health and Social Services; and Alaska Office of History and Archaeology, State Historic Preservation Officer. ADNR would make land management decisions for ROW access across State-managed lands.

Alatna Village Council. Is the federally recognized tribe for the community of Alatna, representing all Tribal members. The Altana Village Council has specialized expertise regarding, but not limited to, land use, subsistence use, wildlife, fisheries, cultural resources, and indigenous knowledge.

Evansville Tribal Council. Is the federally recognized tribe for the community of Evansville, representing all Tribal members. The Evansville Tribal Council has specialized expertise regarding, but not limited to, land use, subsistence use, wildlife, fisheries, cultural resources, and indigenous knowledge.

Huslia Tribal Council. Is the federally recognized tribe for the community of Huslia, representing all Tribal members. The Huslia Tribal Council has specialized expertise regarding, but not limited to, land use, subsistence use, wildlife, fisheries, cultural resources, and indigenous knowledge.

Tanana Tribal Council. Is the federally recognized tribe for the community of Tanana, representing all Tribal members. The Tanana Tribal Council has specialized expertise regarding, but not limited to, land use, subsistence use, wildlife, fisheries, cultural resources, and indigenous knowledge.

Additionally, the **National Park Service** is serving as a participating agency in the development of this Supplemental EIS to coordinate it with their EEA and proposed right-of-way through Gates of the Arctic National Park and Preserve.

For this Draft Supplemental EIS, the BLM held a cooperating agencies' alternatives development and scope of analysis workshop on May 9–10, 2023, in Fairbanks, Alaska. The BLM and cooperating agencies re-examined alternatives concepts that were proposed during the previous EIS process and considered new alternatives concepts that would reduce overall potential impacts, especially impacts to subsistence uses and resources. The cooperating agencies have played an active role in preparing the Supplemental EIS, and have reviewed, suggested edits, and commented on all sections and appendices.

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Appendix J. Section 106 Programmatic Agreement

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PROGRAMMATIC AGREEMENT

BY AND AMONG THE

BUREAU OF LAND MANAGEMENT,

ALASKA STATE HISTORIC PRESERVATION OFFICER, AND

ADVISORY COUNCIL ON HISTORIC PRESERVATION

REGARDING THE

AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD,

ALASKA

Executed the 27th of April, 2020

Expires 2045

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WHEREAS, the Department of the Interior, Bureau of Land Management (BLM) may issue a right-of-way (ROW) grant authorization across federal lands for an all-season, private industrial access road, to the Ambler Mining District, pursuant to the Federal Lands Policy and Management Act of 1976 (43 United States Code [USC] 1701); and

WHEREAS, the Alaska Industrial Development and Export Authority (AIDEA) is the Permittee and has proposed to construct, operate, maintain, and eventually remove the road and related features (Project). The Project will include construction of bridges, material sites, maintenance stations, airstrips, and related ancillary features, and will be built in Phases, beginning with a seasonal, single-lane, gravel pioneer road (Phase I), which will be upgraded in Phase II, and expanded into a 2-lane gravel road in Phase III. AIDEA anticipates the road will have a life of approximately 50 years, at which point the road will be removed and reclaimed; and

WHEREAS, the BLM has determined through consultation with the Alaska State Historic Preservation Officer (SHPO) that the Project is an Undertaking and subject to compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (54 USC 300101 et seq.), and the implementing regulations found at 36 Code of Federal Regulations (CFR) 800; and

WHEREAS, Section 106 requires federal agencies to take into account the effects of their Undertakings on historic properties¹ and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment, prior to any federal authorization or expenditure of federal funds. Furthermore, Section 106 requires consultation with Tribes, other agencies, local governments, interested parties, and the public, for the purpose of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process; and

WHEREAS, the BLM has prepared an Environmental Impact Statement (EIS) for the Project pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 USC 4321 et seq.), with a Record of Decision anticipated in May 2020, and has identified Alternative A/B the preliminarily preferred route for the Project. Alternative A is a 211-mile-long alignment, originating at Milepost 161 of the Dalton Highway, and extending west to the Ambler Mining District. Alternative B is a 228-mile-long alignment with the same origination and terminus points as Alternative A, but it crosses Gates of the Arctic National Preserve (GAAR) at a more southerly point. Maps of the alternatives are found in Attachment A and discussed in detail in the EIS (DOI-BLM-AK-F030-2016-0008-EIS); and

WHEREAS, the Alaska National Interest Lands Conservation Act 201(4)(b) states that the Secretaries of the Interior and Transportation shall permit access for surface transportation purposes across GAAR, managed by the National Park Service (NPS). Portions of Alternatives A and B would cross GAAR, making the Project an Undertaking, and the NPS is an Invited Signatory; and

WHEREAS, the U.S. Army Corps of Engineers (USACE) has jurisdiction over activities that would discharge dredge or fill material into waters of the U.S., including wetlands, and has determined that the Project will require a permit, pursuant to Section 404 of the Clean Water Act (33 USC 1251 et seq.), making the Project an Undertaking and the USACE is an Invited Signatory; and

WHEREAS, the BLM, in agreement with all participating agencies, has agreed to carry out lead federal agency responsibilities for Section 106, pursuant to 36 CFR 800.2(a)(2); and

¹ The term “historic properties” is consistent with 36 CFR 800.16(l)(1) and is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). This includes artifacts, records, and remains that are related to and located within such properties, and includes properties of traditional religious or cultural importance to Tribes or other entities, and that meet the NRHP criteria.

WHEREAS, the BLM, in consultation with the Consulting Parties, established the Undertaking's Area of Potential Effects (APE), pursuant to 36 CFR 800.4(a) and 36 CFR 800.16(d), which encompasses direct, indirect, and cumulative effects on historic properties for the permitted alternative. The APE is described in Attachment B; and

WHEREAS, the Signatories and Invited Signatories, collectively "PA Signatories," recognize that future mining activities within the Ambler Mining District may be a reasonably foreseeable result of this Project; however, no mining activities are proposed or known at this time. The PA Signatories agree that any potential effects on historic properties that may result from future mining activities will be subject to independent Section 106 review as appropriate. The PA Signatories agree to share information on historic properties collected for this Undertaking to the extent practicable, and in accordance with relevant confidentiality restrictions, at such time; and

WHEREAS, as of December 2019, the Alaska Heritage Resources Survey (AHRS) database² lists 15 known resources located within the Direct APE and 64 known resources within the Indirect APE for Alternative A; and 10 known resources within the Direct APE and 43 known resources within the Indirect APE for Alternative B. A table of these resources is provided in Attachment C; and

WHEREAS, the BLM has determined that the Undertaking may have an adverse effect on historic properties, pursuant to 36 CFR 800.5. There are total of 18 known AHRS resources within the Direct APE and 87 additional known AHRS resources within the Indirect APE that may be adversely affected by the Undertaking (this includes resources in both the A and B Alternatives) and include prehistoric and historic archaeological resources, trails, camps, and mining features. Of these resources, only 1 has been determined eligible for listing in the National Register of Historic Places (NRHP), while the remaining 104 known resources have not been evaluated (listed in Attachment C); and

WHEREAS, the Permittee has proposed to construct the Project in Phases, and each Phase will consist of individual Components, Stages, and Segments³, and the BLM has determined that effects to historic properties cannot be fully accounted for prior to issuance of the EIS Record of Decision. Therefore, this Programmatic Agreement (PA) was developed in consultation with the Consulting Parties to establish an alternative process for implementing Section 106 in a phased approach, pursuant to 36 CFR 800.14(b); and

WHEREAS, the SHPO has participated in the development of this PA and is a Signatory, pursuant to 36 CFR 800.6(c)(1)(ii); and

WHEREAS, the ACHP has participated in the development of this PA and is a Signatory, pursuant to 36 CFR 800.6(c)(1)(ii); and

WHEREAS, the BLM recognizes that the Federal Government has a unique legal relationship with Tribes set forth in the U.S. Constitution, and the PA outlines the process by which the BLM will complete a good

² The AHRS database is maintained by the Alaska Office of History and Archaeology, and includes buildings, objects, structures, archaeological and historic sites, districts, shipwrecks, travel ways, traditional cultural properties, landscapes, and other places of cultural importance.

³ Project Phases include a Pre-Construction Phase, a pioneer road (Phase I), an all-seasons road (Phase II), and a 2-lane all-seasons road (Phase III) as well as Operations and Maintenance and Reclamation Phases. See Attachment G for more detailed descriptions. Components are defined as types of ancillary feature, such as bridges or materials sites. Segments are defined as geographical sections of the Project. Stages are defined as the specific construction activities that would occur for each construction Phase or Component.

faith effort to consult with Tribes⁴ to identify concerns about historic properties, to advise on the identification and evaluation of historic properties, including those of traditional religious, spiritual, or cultural importance, to articulate views on the Undertaking's effects on such properties, and to participate in the resolution of adverse effects, pursuant to 36 CFR 800.2(c)(2)(ii); and

WHEREAS, the BLM invited 78 Tribes, listed in Attachment D, to participate in the Section 106 process as Consulting Parties, and Alatna Village Council; Allakaket Village Council; Dinyea Corporation; Doyon, Limited; Evansville, Incorporated; Evansville Village; Gana-A'Yoo, Limited; Hughes Village Council; Huslia Village Council; K'oyitl'ots'ina, Limited; NANA Regional Corporation; Native Village of Ambler; Native Village of Kobuk; Native Village of Noatak; Native Village of Selawik; Native Village of Shungnak; Native Village of Stevens; Native Village of Tanana; Noorvik Native Community; and the Village of Anaktuvuk Pass have consulted with the BLM during development of the PA and may sign as Concurring Parties; and

WHEREAS, the BLM consulted with private landowners for lands within the APE for Alternatives A and B, including Doyon, Limited; NANA Regional Corporation; and Evansville, Incorporated; and these entities participated in PA development. In addition, the BLM consulted with the Bureau of Indian Affairs regarding 2 allotments (AKFF 018439D, AKFF 018992C) located within the APE for Alternatives A and B, and another 3 allotments (AKFF 017613A, AKFF 017613B, AKFF 017614A) located within the APE for Alternative B; and

WHEREAS, the BLM has made a good faith effort to consult with local governments and other interested parties pursuant to 36 CFR 800.2(c)(3) and 36 CFR 800.2(c)(5), and the City of Allakaket, the Northwest Arctic Borough and Tanana Chiefs Conference have participated in the development of this PA as Consulting Parties and may sign as Concurring Parties; and

WHEREAS, the BLM has coordinated Section 106 and NEPA, pursuant to 36 CFR 800.8 and consistent with guidance from the Council on Environmental Quality and ACHP *Handbook for Integrating NEPA and Section 106*, and has provided opportunities for the public to comment on, discuss, or share information or concerns about the Undertaking during public scoping and comment periods for the EIS and has considered all comments received; and

WHEREAS, the BLM has consulted with AIDEA (Permittee) on the development of this PA pursuant to 36 CFR 800.2(c)(4), and the Permittee has agreed to carry out Stipulations in this PA and is an Invited Signatory; and

WHEREAS, the Alaska Department of Natural Resources is a landowner and to address its obligations to protect state-owned historic, prehistoric, or archaeological resources as provided under Alaska Statute (AS) 41.35, has participated in the development of this PA and is an Invited Signatory; and

NOW THEREFORE, the BLM, the SHPO, and the ACHP agree that the Project shall be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties.

STIPULATIONS

The BLM shall ensure that the following stipulations are carried out:

⁴ Throughout this document, the term "Tribe" or "Tribes" is consistent with the definition found at 36 CFR 800.16(m) and refers to a tribe, band, nation, or other organized group or community, including a native village, regional corporation or village corporation, formed pursuant to Section 3 of the Alaska Native Claims Settlement Act (43 USC 1602).

I. STANDARDS

- A.** The BLM shall ensure that all work carried out pursuant to this PA meets the Secretary of the Interior (SOI) Standards for Archaeology and Historic Preservation (found at http://www.nps.gov/history/local-law/arch_stnds_9.htm), taking into account the suggested approaches to new construction in the SOI's Standards for Rehabilitation.
- B.** The BLM shall ensure that all work carried out pursuant to this PA shall be done by or under the direct supervision of historic preservation professionals who meet the SOI's Professional Qualifications Standards. The BLM and the Permittee shall ensure that contractors retained for services pursuant to the PA meet these standards.
- C.** The BLM recognizes that Tribes or other groups may have special expertise regarding places of traditional religious, spiritual, or cultural significance, or Traditional Cultural Properties (TCPs), but these individuals or groups may not meet the standards in I.A and I.B. However, the BLM will equally consider and incorporate special expertise into decisions regarding the implementation of this PA, consistent with 36 CFR 800.2(c)(2).

II. ADMINISTRATIVE STIPULATIONS

- A.** This PA shall apply to the Project and all of its Phases, Components, and Stages, including those not known at this time, not defined in the EIS, or not specified in the permits, permit applications, or other Project documents, so long as the activities occur within the jurisdiction of a state or federal agency.
- B.** The BLM, the NPS, the USACE, and State shall enforce the terms of this PA within each agency's scope and shall incorporate this PA and its terms into any decision document, permit, or authorization they issue. Each shall notify the others within 5 business days if any of them becomes aware of an instance of possible non-compliance with the terms and conditions of this PA or permit conditions as they relate to this PA. If this occurs, the BLM shall ensure that measures are taken to resolve non-compliance issues, consistent with its legal authorities, and will consult with the other PA Signatories, as needed.
- C.** The PA Signatories recognize that certain information about historic properties or archaeological resources are protected from public disclosure under the NHPA (54 USC 307103), the Archaeological Resources Protection Act (ARPA; 43 CFR 7.18), and Alaska State law, as required by Public Law 96-95, AS 40.25.120(a)(4), and Policy and Procedure No. 50200. Parties to this agreement shall ensure that all actions and documentation prescribed by this PA are consistent with the non-disclosure requirements of these laws.
- D.** Any of the PA Signatories may seek qualified independent expert consultation through a contractor, in order to fulfill the responsibilities under this PA, provided the contractor meets Stipulation I, Standards.
- E.** Email will be an acceptable form of communication between the Consulting Parties and is an appropriate method of "notification" or "in writing" where it is called for in this PA, unless otherwise described. If a Consulting Party does not have access to email or consistently available internet service, then the BLM will ensure that other forms of communication are made available. All the Consulting Parties should immediately notify the BLM if a point of contact within their organization changes and provide updated information. The BLM will maintain an updated list of current contact names, organizations, and email addresses as a component of Attachment E, Cultural Resource Management Plan. Updates to the contact list will not require an amendment.

- F. In the event that another federal agency, not initially a party to this PA, receives an application for funding/license/permit for the Undertaking, as it is described in this PA, that agency may fulfill its Section 106 responsibilities by stating in writing that it concurs with the terms of this PA and by notifying the Signatories that it intends to do so. Such agreement shall be evidenced by execution of a Signature Page and filing it with the ACHP, and implementation of the terms of this PA.
- G. This PA will not supersede or replace any guidelines, stipulations, or requirements in the BLM national PA and associated Alaska Protocol⁵; or the PA on Protection of Historic Properties During Emergency Response and associated Alaska Implementation Guidelines⁶.

III. AGENCY ROLES AND RESPONSIBILITIES

- A. The BLM, the NPS, the USACE, and State shall attach this PA or its stipulations to any agency-specific permits or authorizations for the Project. Those agencies shall ensure that requirements of this PA have been met for the Undertaking under their respective jurisdictions. Failure by the Permittee to comply with the stipulations could result in suspension, modification, or revocation of permits or authorizations.
- B. The BLM, the NPS, the USACE, and State shall ensure that no ground disturbance, including brush clearing, geotechnical surveys, or any other activity associated with the Project that may affect historic properties, takes place within a Project Segment, Stage, or Component until identification, evaluation, and on-site measures for resolution of adverse effects have been completed for that Segment, Stage, or Component. The NPS, the USACE, and State will inform the BLM in writing once the stipulations within each agency's scope, as outlined in this PA, have been satisfied by the Permittee. The BLM will then provide written notice to the Permittee that Section 106 requirements have been satisfied for that Segment, Stage, or Component.
- C. The BLM, the NPS, the USACE, and State shall consult, at a minimum, during the Annual Meeting to ensure that each agency independently satisfies its respective regulatory requirements under 36 CFR 800 and AS 41.35.200(a). If any PA Signatory fails to comply with the PA, the BLM shall implement the procedures outlined in Stipulation XVI, Dispute Resolution.

IV. PERMITTEE RESPONSIBILITIES

- A. If the Project is permitted, this PA and all its requirements will be binding on AIDEA as the Permittee, and any heirs, successors, assigns, joint ventures, and any contractors acting on behalf of the Permittee. The Permittee will include a provision requiring compliance with the PA in any contract of sale or transfer of ownership or management of the Project.
- B. The Permittee shall be responsible for funding and implementing, either directly or through qualified contractors, the work necessary to ensure compliance with the terms of this PA. This work will be completed on behalf and at the direction of the BLM.

⁵ BLM PA: <https://www.blm.gov/sites/blm.gov/files/National%20Programmatic%20Agreement.pdf>
Protocols for Alaska: <https://www.blm.gov/sites/blm.gov/files/AK%20Protocol.pdf>

⁶ Emergency Response PA: https://www.nrt.org/sites/2/files/Programmatic_Agreement_on_Protection_of.pdf
Alaska Guidelines: <http://dnr.alaska.gov/parks/oha/oilspill.htm>

- C.** The Permittee shall ensure that any persons conducting or supervising cultural resources work on their behalf hold all appropriate federal or state permits and/or authorizations for that work, and meet Stipulation I, Standards, for the applicable discipline.
- D.** The Permittee shall ensure all necessary federal, state, and private landowner permits and/or authorizations are obtained for conducting archaeological survey, excavation, and monitoring, consistent with the permitting process for the applicable agency and/or landowner. Applicable permits include Permits for Archaeological Investigations from the BLM and/or the NPS, the Alaska State Cultural Resource Investigation Permit from the State, and authorizations from the Northwest Arctic Borough; NANA; Doyon, Limited; Evansville, Limited; and/or other private landowners.
- E.** Prior to the initiation of ground disturbing activities for each Project Phase, the Permittee shall provide a technical design plan for that Phase (Phase Plan) to the BLM that contains detailed descriptions of the locations of all Segments and Components, detailed descriptions of the planned work Stages, and anticipated work schedules for all activities that will occur during that Phase. The Plan must contain detailed maps and a GIS deliverable with the spatial locations of the planned work. The BLM will distribute Phase Plans to Consulting Parties for informational purposes and will append them to Attachment G, Project Plans. Each Phase Plan will contain all information known at that time for that Phase; however, changes to the technical designs, methods, or schedules may be incorporated into the Annual Work Plan (VII.B.i), rather than necessitating a revision of the Phase Plan.
- F.** The Permittee may carry out the stipulations of this PA in a phased approach for identification and evaluation per 36 CFR 800.4(b)(2), based on Project Segments, Stages, and Components, but will not initiate any ground disturbance, or other types of activities that could adversely affect historic properties, before inventory, evaluation, assessment, and on-site measures for resolution of adverse effects has been completed for that Segment, Stage, or Component. Prior to commencement of any activities that could affect historic properties, the Permittee must receive written notice from the BLM that Section 106 requirements have been satisfied for that Segment, Stage, or Component.
- G.** The Permittee shall develop a tribal liaison/representative program in collaboration with Tribes. The program may be a component of other Project-wide efforts (subsistence advisory committees or similar) but must provide an opportunity for Tribal representatives to participate in and share information for cultural resource management activities. To the extent practicable, the Permittee will make opportunities available for Tribal liaisons/representatives to accompany cultural resource personnel during fieldwork and/or monitoring activities. The Permittee will provide a description of the program and identify Tribal liaisons/representatives and roles for the upcoming year in the Annual Work Plan (VII.B.i); the Permittee will report on all activities under the program as part of the Annual PA Report (XV.B). The BLM will ensure the program is reviewed as part of the Annual Meeting (XV.A) and will require the Permittee to make adjustments to the program as necessary, to ensure adequate opportunities are provided for Tribal participation and input during cultural resource management activities.

- H. The Permittee, and any contractors hired on their behalf, will not retain sensitive information⁷ that Tribes or Consulting Parties authorize them to collect, except as required for compliance with the terms of the PA and Cultural Resources Management Plan (CRMP), Attachment E. Sensitive information includes information covered under Section 304 of the NHPA (54 USC 307103), ARPA (43 CFR 7.18), or AS 40.25.120(a)(4).
- I. The Permittee shall create a password-protected file sharing platform to allow PA Signatories to easily share data associated with implementation of the PA. All reports and deliverables shall be transferred to the BLM, other PA Signatories, and/or Consulting Parties through this platform. Access will be restricted consistent with the terms of the PA. If a Consulting Party does not have access to email or consistently available internet service, then the BLM will ensure that other forms of delivery are made available.
- J. The Permittee shall ensure that any Project personnel found vandalizing, moving, or taking cultural materials, or violating any portion of ARPA (16 USC 470aa) or AS 41.35.200, will be subject to appropriate disciplinary action up to and including immediate termination. In each instance, the Permittee shall consult with the BLM, the SHPO, and the landowner/manager to determine whether a report to appropriate law enforcement authority is warranted.
- K. The Permittee is responsible for gaining access to private property for the purposes of implementing this PA and will notify the BLM when access has been granted. In cases where the Permittee cannot gain access, identification efforts on that property may be deferred until access is gained. If a private landowner refuses entry, the BLM, the SHPO, and Permittee will consult on a case-by-case basis and consider alternative survey methods. The Permittee will be responsible for ensuring efforts are commensurate with cultural resource management industry standards and meet a good faith intent for carrying out inventory, evaluation, assessment of effects, and resolution of adverse effects on all private property consistent with the terms of this PA; failure to meet the good faith standard for inventory could result in suspension, modification, or revocation of permits or authorizations.

V. CONSULTATION

- A. The BLM shall use the Secretary's *Standards and Guidelines for Federal Agency Preservation Programs* as a guide for consultation. Consultation means the process of seeking, discussing, and considering the views of other participants, and, when feasible, seeking agreement with them regarding matters arising in the Section 106 process. Additional details regarding consultation are provided in the CRMP, Attachment E.
- B. The BLM shall conduct government-to-government consultation with Tribes located near the permitted route, or with Tribes that have traditionally used that area in the past. The BLM will use Handbook 1780-1, *Improving and Sustaining BLM-Tribal Relations*, as a guideline for Tribal consultation. The BLM will consult with Tribes to identify places that may be of traditional religious, spiritual, or cultural importance to them. The BLM, in consultation with the SHPO and Tribe(s), shall determine whether those places are historic properties, whether there would be an adverse effect from the Undertaking, and, if so, appropriate measures to resolve the adverse effect(s). Information shared by Tribes that is of a culturally sensitive nature will be respected and treated in a confidential manner. The

⁷ Sensitive information is defined as including information about the location, character, or ownership of a historic property if disclosure to the public may cause a significant invasion of privacy, risk harm to the historic property, or impede the use of a traditional religious site by practitioners (54 USC 307103).

BLM will consult early in the identification process with Tribes to determine what is considered sensitive information, and the means by which that information will be collected, shared, and returned and/or destroyed, consistent with Stipulation II.C. The BLM will continue to consult on a government-to-government basis with Tribes throughout the duration of this PA. Further details on Tribal consultation are provided in the CRMP, Attachment E.

- C. The BLM shall ensure the SHPO receives all technical reports, in keeping with the SHPO's mission to identify and maintain inventories of cultural resources and historic properties per Section 101 of NHPA (54 USC 302301) and AS 41.35.070. The SHPO will retain location information about all cultural resources and historic properties, including properties of religious, spiritual, or cultural significance to Tribes; however, at the request of one or more Tribes, the SHPO will treat information regarding specific historic properties of traditional religious, spiritual, or cultural significance as sensitive information subject to Section 304 of the NHPA, 36 CFR 800.11(c), and/or applicable state laws.
- D. The BLM shall consult with the Permittee regularly or at the Annual Meeting (XV.A) to share information, gathered during consultation with Tribes or other entities, that may be relevant to the Permittee's responsibilities under this PA. This includes, but is not limited to, information relevant to training curriculum, information relevant to inventory efforts, requests to participate in monitoring activities, requests to accompany crews in the field, and requests to participate in Tribal liaison activities.
- E. The BLM shall ensure that the Consulting Parties are kept informed on the Undertaking and implementation of this PA and shall provide opportunities for review and comment on all pertinent documents. The BLM's consultation will, at a minimum, include distribution of the Annual PA Report (XV.B) to Consulting Parties via email and facilitation of the Annual Meeting (XV.A).
- F. The BLM shall consult with and provide information to the public, pursuant to 36 CFR 800.2(d). The BLM and the Permittee will post the Annual PA Report (XV.B), with confidential information redacted as necessary, on their respective websites for the Project. The Permittee will mention the availability of the Annual PA Report in newsletters or similar forms of communication that are sent to the public and other interested parties.
- G. The BLM delegates responsibilities to the Permittee for consultation with private landowners, unless the landowner requests to consult with the BLM, at which point the BLM will assume consultation responsibilities to the extent requested by the landowner. The Permittee will notify landowners that consultation with the BLM is an option.

VI. CULTURAL RESOURCES MANAGEMENT PLAN

- A. The BLM, in consultation with the PA Signatories, has prepared a Cultural Resources Management Plan to guide compliance with the stipulations in this PA and is included as Attachment E. At the time of PA execution, all sections of the CRMP are considered complete, except for Chapter 6, Historic Property Treatment and Mitigation, and guidance for the Operations and Maintenance Phases and Reclamation Phase of the Project. The BLM shall ensure that content is developed and incorporated into the CRMP in accordance with the following timeline:
 - i. 12 months following PA execution, the BLM will submit standard mitigation guidance for archaeological sites, historic trails, and other property types that are common in the APE (Chapter 6 of the CRMP).

- ii. No later than 1 year prior to the Project transitioning into the Operations and Maintenance Phase, the CRMP will contain finalized guidance for that Phase, which may include a streamlined Section 106 and/or Alaska Historic Preservation Act review process.
 - iii. No later than 1 year prior to the Project transitioning into Reclamation, on any portion of the Project, the CRMP will contain finalized guidance for reclamation activities, which may include streamlined Section 106 and/or Alaska Historic Preservation Act review processes.
- B.** The BLM will facilitate monthly consultation meetings with the other PA Signatories, and other Consulting Parties that provide written notification they wish to participate, for drafting the remaining CRMP guidance, either via phone or in person, or as determined necessary by the PA Signatories. The BLM will provide the PA Signatories with revisions to the CRMP at least 15 working days prior to any meetings. The BLM will incorporate comments received and provide updated drafts to the PA Signatories. The first review and last review will be a 30-day⁸ period.
- C.** The BLM will solicit comments from Consulting Parties at the beginning of each new content development process (steps VI.A.i through VI.A.iii) and provide each draft final CRMP to Consulting Parties for a 30-day review and comment period and will consider all timely comments received. The CRMP will be finalized when the SHPO, the BLM Central Yukon Field Office Manager, and the NPS GAAR Superintendent sign Exhibit F of the CRMP. The BLM will distribute the final CRMP to the Consulting Parties and incorporate it as the finalized version of Attachment E.
- D.** Amendments or addendums to the CRMP will follow Stipulation XVII.B.ii, Amendments and Addendums.

VII. ALTERNATIVE FOUR STEP PROCESS

- A.** The BLM shall use the following phased process for the Undertaking, to complete inventory, evaluation, assessment of effects, and resolution of adverse effects, consistent with 36 CFR 800.3-800.6, and will direct the Permittee to gather sufficient data to fulfill documentation standards consistent with 36 CFR 800.11, in a manner that will accommodate the Permittee's phased construction and development of the Project.
- B. Reporting Process** – The Permittee will provide the following plans and reports for compliance with the Alternative Four Step Process, and will ensure they are commensurate with cultural resource management industry standards and meet a good-faith intent for carrying out inventory, evaluation, assessment of effects, and resolution of adverse effects in a phased approach. See also the steps outlined in Stipulation XIV, Document Submission and Review, and Attachment F, Reporting Table:
- i. Annual Work Plan – The Permittee will provide the BLM with an Annual Work Plan, no later than March 1 of each year, or at least 60 days prior to fieldwork initiation for the first year. The BLM will submit the Annual Work Plan to Consulting Parties at least 15 days prior to the Annual Meeting (XV.A). The Annual Work Plan will contain detailed information about the anticipated work for the upcoming year, where it will occur, how it will be phased within Project Segments, Stages, and/or Components, and how the Permittee will meet the PA

⁸ Unless otherwise noted, days refers to calendar days throughout this document.

requirements. Other submissions with the Annual Work Plan may include updates to the Phase Plan (IV.E), Historic Themes (VII.C.ii.a), Ethnographic Resources (VII.C.iii), the Monitoring Plan (X.D), and Contractor Training curriculum (XI.B). The Plan must contain detailed maps and a GIS deliverable with the spatial locations of the planned work. Consulting Parties will have a 30-day review and comment period for the Annual Work Plan, which will follow the steps described in Stipulation XIV, Document Submission and Review. The BLM and the SHPO must approve of the Annual Work Plan before it can be implemented; any work that will occur under NPS jurisdiction will also require approval by the NPS.

- ii. Interim Report for Indirect APE – Within 30 days following completion of fieldwork each year, the Permittee will submit an Interim Report for the Indirect APE to the BLM, providing a brief description of cultural resources identified in the Indirect APE during that reporting period. Within 5 days of receipt, the BLM will submit the Interim Report to the Consulting Parties for a 15-day review period to seek comments on which resources within the Indirect APE should be evaluated for the NRHP. The BLM will consult with the SHPO, and the NPS as appropriate, within 7 business days following the 15-day review to consider all timely comments received, and then will direct the Permittee to make recommendations of eligibility, assessment of effects, and measures for resolution of adverse effects for specific resources in the Indirect APE, which the Permittee will include in the Annual Fieldwork Report (VII.B.iii).
- iii. Annual Fieldwork Report – The Permittee will submit a Fieldwork Report to the BLM within 90 days following completion of fieldwork each year that will fulfill documentation standards consistent with 36 CFR 800.11. The Report will contain 1) a description of inventory efforts completed since the last report, including monitoring results; 2) NRHP eligibility recommendations; 3) finding of effect recommendations for resources that may be eligible; and 4) recommended resolution measures for resources that may be adversely affected. The Report must contain detailed maps and a GIS deliverable with the spatial locations of the completed work. The BLM will distribute the Annual Fieldwork Report to Consulting Parties for a 45-day review and comment period, which will follow the steps listed in Stipulation XIV, Document Submission and Review. The BLM and the SHPO must approve of the Annual Fieldwork Report before it will be considered complete; relevant portions of the report for cultural resources under NPS jurisdiction will also require approval by the NPS.
 - a. Within 15 days following the 45-day Consulting Party review, the BLM will consider any timely comments received and will submit Determinations of Eligibility (DOEs), assessment of effects, and proposed mitigation measures to the SHPO, consistent with 36 CFR 800.4-6. If no response is received from the SHPO within 30 days, the BLM shall move forward with their determinations and findings. The BLM's documentation will cite the Project design date/version used to assess adverse effects.
 - b. If the BLM, through consultation with other Consulting Parties during the 45-day report review period, determines that adequate information has not been provided for a DOE or finding of effect, the BLM will require the Permittee to provide additional information or conduct additional

- fieldwork as necessary. After the Permittee has gathered the additional information, the Permittee will submit it as a report addendum to the BLM, which the BLM will distribute to Consulting Parties for another 30-day review. The BLM will take into consideration any timely comments received and will provide a DOE, assessment of effects, and proposed mitigation measures to the SHPO within 15 days. If no response is received, the BLM shall move forward with their determination.
- c. If the BLM and the SHPO do not agree on NRHP eligibility of a resource, the BLM shall forward all documentation to the Keeper of the National Register, pursuant to 36 CFR 63.2(d), for an official determination.
 - d. If a Consulting Party objects to a finding of effect within the 45-day review period, and provides reasons for the disagreement, the BLM shall either consult with the objecting party or forward the finding and supporting documentation to the ACHP for comment, consistent with 36 CFR 800.5(c)(2).
 - e. The BLM may determine that evaluation of a historic property(ies) may be necessary outside of the annual report cycle. In these instances, the same review process will be followed but may be reduced to a 15-day review and comment period for Consulting Parties, and a 7-day period for the BLM to incorporate timely comments received and submit to the SHPO. If no response is received from SHPO within 30 days, the BLM shall move forward with their determination(s) and finding(s).
- iv. Treatment Plans – Within 120 days following Stipulation VII.B.iii.a, the conclusion of the SHPO’s 30-day review of DOEs and assessment of effects, the Permittee will develop proposed property-specific Treatment Plans and submit them to the BLM. The Treatment Plans will contain detailed information on treatment measures, a schedule for when the measures will be implemented, and a schedule for when deliverables will be finalized and distributed. The BLM will distribute the Treatment Plans to the Consulting Parties for a 30-day review and comment period, which will follow the steps outlined in Stipulation XIV, Document Submission and Review. The Permittee, or contractors hired on their behalf, will implement the Treatment Plans, following approval of the Plans by the BLM and the SHPO; Treatment Plans for historic properties under NPS jurisdiction will also require approval by the NPS.
 - a. The BLM may determine that development of a Treatment Plan will require additional time beyond the timelines described above, due to the need for additional consultation, unique characteristics of the property, or other factors. In these instances, the BLM, in consultation with Consulting Parties, will determine what steps must be taken for the Permittee to develop and implement appropriate mitigation measures. Subsequent Treatment Plan reviews will include a 30-day review and comment period, and will follow the steps outlined in Stipulation XIV, Document Submission and Review.
 - v. Final Implementation Report – The Permittee will submit a Final Implementation Report for each historic property to the BLM, within 180 days after implementation of the Treatment Plan is complete, or within a timeframe specified

in the Treatment Plan. The Final Implementation Report will be a comprehensive record of all activities that occurred at that historic property, from inventory through implementation of treatment measures, and will describe all completed steps, analyses, methods, and results, including collections and datasets generated. The BLM will provide the Report to the Consulting Parties for a 30-day review and comment period, which will follow the steps outlined in Stipulation XIV, Document Submission and Review. The BLM and the SHPO must approve of all Final Implementation Reports before they will be considered complete; Final Implementation Reports for historic properties under NPS jurisdiction will also require approval by the NPS.

- vi. Technical Reports – The BLM, in consultation with the other PA Signatories, may determine that technical reports are necessary to summarize the results of background research, fieldwork activities, and laboratory analyses in order to fully understand Project effects to historic properties, or may be useful as mitigation measures for broad-scale effects. Technical Reports should not require extensive efforts to gather new information, but rather be a compilation of existing information. The BLM will consult with the other PA Signatories at the Annual Meeting to consider whether a technical report(s) may be needed, and if so, what content it should contain and subsequent review process. The Permittee will be responsible for compiling the report(s) and submitting to the BLM. The BLM will provide the report to Consulting Parties for at least a 30-day review period, which will follow the steps outlined in Stipulation XIV, Document Submission and Review. The BLM and the SHPO must approve of Technical Reports before they can be considered finalized.

C. Inventory Process – Based on a Data Gap analysis for the Project⁹, the cultural resources that are likely to be encountered during inventory, and may meet the definition of historic properties, fit into 3 broad categories: archaeological resources, historic resources, and ethnographic resources. Through consultation, the BLM determined that a reasonable and good faith effort, pursuant to 36 CFR 800.4(b)(1), requires separate inventory¹⁰ methods to account for archaeological, historic, and ethnographic resources, which will include background archival research as well as pedestrian survey, consistent with the SOI's Standards for Identification. The BLM shall ensure that inventory for archaeological, historic, and ethnographic resources occurs as follows:

- i. Archaeological Resources – The Permittee shall employ a qualified contractor to create a Geographic Information System (GIS) model of prehistoric and protohistoric archaeological resource potential within the APE for the permitted alternative. The model will categorize areas within the APE for the potential presence of prehistoric and protohistoric archaeological resources. The Permittee will provide the model, summary documentation regarding the variables used to create it, and how the model will be tested during implementation to the BLM within 6 months after the PA is executed. The BLM will distribute the model and documentation to the other PA Signatories for a 30-day review and comment

⁹ Ford et al. 2018. Ambler Road Environmental Impact Statement: Cultural Resources Data Gap Analysis Report. Prepared by HDR, for the Bureau of Land Management, Central Yukon Field Office, Fairbanks, Alaska.

¹⁰ The term “inventory” is used throughout this document to refer to all efforts to compile information on historic properties, including consultation, archival research, and fieldwork. The term “survey” refers to inventory efforts that are field based only.

period. The BLM shall require the Permittee to make changes and modifications as necessary, based on comments received. Annually throughout Phase I of the Project, or as determined necessary by the PA Signatories, the model will be refined based on new data obtained through fieldwork and/or updated environmental datasets. Based on model results, pedestrian survey will be required for portions of the APE, per Stipulation VII.D. Additional details are provided in the CRMP, Attachment E.

- ii. Historic Resources – The Permittee will employ qualified contractors to develop Historic Theme reports relating to historic period resources, such as (but not limited to) traditional subsistence economy; traditional hunting, trapping, and guiding economies; traditional trade networks; historic exploration and travel corridors; and prospecting and mining. The purpose of the Historic Themes is to gather information on historic-era resources or places associated with historic events that may be present within the APE, and to identify areas that are high potential and require pedestrian survey. The documentation efforts will include a comprehensive summary of available data sources and will include GIS mapping of any relevant spatial information. Additional details are provided in the CRMP, Attachment E, including a list of potential data sources (Chapter 4.1.2).
 - a. The Permittee will submit the Historic Theme reports to the BLM 60 days prior to initiation of the first season of fieldwork, and any updates to the Themes with the Annual Work Plan each year thereafter. The BLM will share the reports with Consulting Parties for a 30-day review and comment period, which will follow the steps outlined in Stipulation XIV, Document Submission and Review. The BLM and the SHPO must approve of the Historic Themes.
 - b. The Permittee, or contractors hired on their behalf, will conduct pedestrian survey in areas identified in the Historic Themes as high potential for historic resources, per Stipulation VII.D.i.
 - c. Historic Themes may be further developed as Historic Contexts for NRHP eligibility considerations, consistent with Stipulation VII.E.
- iii. Ethnographic Resources – The BLM shall make a good faith effort to provide Tribes, local governments, and other communities with an opportunity to identify ethnographic resources, including places of traditional religious or cultural importance, within the APE, consistent with Stipulation V, Consultation. Ethnographic resources are likely present but are generally only identifiable by the community sharing the values, traditions, beliefs, or social institutions associated with such places, but could also be identified through archival research or other means. The BLM shall consider the nature and location of ethnographic resources identified, and determine through consultation with the party(ies) that identified the resource and the SHPO if additional work, in the form of oral interviews, research, GIS mapping, site visits, or other culturally-appropriate methods, are necessary to document the ethnographic resource(s). Additional details are provided in the CRMP, Attachment E.
 - a. As necessary, the BLM shall gather sufficient information to complete a determination of NRHP eligibility for identified resources if it is identified as a sensitive resource, or shall direct the Permittee to gather information

and make a recommendation of NRHP eligibility for the BLM to consider, if the resource is not considered sensitive. The Permittee shall integrate the results of the ethnographic investigation into the Annual Fieldwork Report, unless the resource needs to be treated confidentially.

- b. At the time of PA execution, the following Tribes and local governments have indicated areas of cultural importance and/or ethnographic resources that may be affected by 1 or more alternative, and for which the BLM will consult further:

Alatna Village Council
Allakaket Village Council
City of Allakaket
City of Anaktuvuk Pass
Dinyea Corporation
Evansville Village
Evansville, Incorporated
Hughes Village Council
Huslia Village Council
Native Village of Kobuk
Native Village of Noatak
Native Village of Selawik
Native Village of Stevens
Native Village of Tanana
Northwest Arctic Borough
Noorvik Native Community
Village of Anaktuvuk Pass

D. Survey Process – As a component of the inventory process and consistent with 36 CFR 800.4, the BLM shall ensure the Permittee, or contractors hired on their behalf, complete a reasonable and good faith effort for pedestrian survey and testing within the APE. This will include survey and/or testing in areas that are likely to contain archaeological, historic, and ethnographic resources, but will not require 100 percent survey coverage of the APE. To determine where survey is required, the Permittee will incorporate the archaeological model (VII.C.i), Historic Theme reports (VII.C.ii.a), and ethnographic information (VII.C.iii) to categorize the APE as high, medium, and low potential for the presence of cultural resources (see additional details in Attachment E, CRMP). The level of effort for survey will vary based on the APE categorization but will use standard field methods described in Chapter 4 of the CRMP. This effort, collectively, will be known as the Survey Strategy¹¹. The Permittee will provide a detailed description of the Survey Strategy as part of the Annual Work Plan (VII.B.i), and will update and refine it annually to incorporate the results of the previous year's inventory efforts and/or any new or updated datasets. The BLM will provide the Permittee with information that is relevant to the inventory process on a regular basis, or at least by December 30 of each year, so that the Permittee can incorporate it into the Survey Strategy. Based on the Survey Strategy, the Permittee, or

¹¹ The term "Survey Strategy" is used throughout the document to refer to required field efforts to identify archaeological, historic, and ethnographic resources within the APE. The Survey Strategy will be developed by compiling multiple data sources for those resources, which will then be used to classify the APE into areas of high, medium, or low potential for cultural resources.

contractors hired on their behalf, will complete pedestrian survey and testing in the APE according to the following requirements:

- i. High Potential: Defined as landforms adjacent to wetlands, riparian areas, watershed confluences, lakes, streams, Revised Statute 2477 trails, villages, and AHRS sites, or identified as high potential through consultation, research, and or/field evaluation. Pedestrian survey and testing is required for 100 percent of high potential areas within the Direct APE. If the Field Crew Chief determines that subsurface testing within these areas is not necessary, he/she will document how and why that determination was made.
- ii. Low Potential: Defined as areas that are wetlands, perennially inundated, areas of tussock tundra, or slopes over 25 degrees, unless identified as a high potential through consultation, research, and/or field evaluation. Pedestrian survey and testing is required for 10 percent of low potential areas within the Direct APE. Otherwise, areas that are identified as low potential will not require pedestrian survey or subsurface testing. If the Field Crew Chief determines that subsurface testing within these areas is not necessary, he/she will document how and why that determination was made.
- iii. Medium Potential: Areas not defined as either low potential or high potential. Pedestrian survey and testing is required for 50 percent of medium potential areas within the Direct APE. If the Field Crew Chief determines that subsurface testing within these areas is not necessary, he/she will document how and why that determination was made.
- iv. Previously Surveyed Areas: The Permittee will not be required to conduct pedestrian survey and testing in areas of the APE that have been previously inventoried in the past 10 years via methods that are commensurate with, or meet, the PA Stipulations and CRMP Guidelines. However, it may be necessary for the Permittee or their contractors to revisit known resources to collect adequate data for NRHP eligibility recommendations. The Permittee will evaluate previous pedestrian surveys and provide recommendations on whether those areas need to be revisited as part of the Survey Strategy.
- v. Indirect APE: Survey for subsurface resources in the Indirect APE is not required, unless there are reasonably foreseeable adverse effects from the Undertaking. Survey for surface resources may be required; however, the BLM cannot make informed decisions on the extent of the effects until Project design plans, footprints, construction methods, and schedule are finalized and submitted as Phase Plans (IV.E) and/or Annual Work Plans (VII.B.i). Potential direct, indirect, or cumulative effects may occur from increased access along or across the proposed road corridor, soil erosion or deposition downstream of water crossings and bridges, or other visual, audible, or atmospheric factors. Additional inventory and/or monitoring may be required, particularly in areas vulnerable to erosion, including water crossings, downstream of water crossings, hillside cuts, and trail or access crossings. The Permittee will provide new or updated Project plans to the BLM as part of the Annual PA Report (XV.B) and the PA Signatories will review and consider whether the Permittee will be required to complete additional inventory and/or monitoring within the Indirect APE during the Annual Meeting (XV.A).

- E. Evaluation Process:** Per 36 CFR 800.4(c) and 36 CFR 60.4, the BLM shall ensure that the Permittee, or contractors hired on their behalf, evaluate all identified cultural resources within the Direct APE and Indirect APE to determine if they are eligible for the NRHP. Evaluation will follow 36 CFR 63, NPS Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, and/or other appropriate guidelines, and will consider both individual and district-level eligibility. Resources of a similar nature may be evaluated as a multiple property listing or as a district to create more efficiencies in the process. The Permittee will provide all recommendations of eligibility to the BLM as part of the Annual Fieldwork Report (VII.B.iii). The BLM will submit final DOEs to SHPO following Stipulation VII.B.iii.a. Additional details on evaluation are provided in Attachment E (CRMP). Cultural resources that are not eligible for the NRHP will no longer be subject to the terms of this PA.
- F. Assessment and Resolution of Adverse Effects:** The BLM shall ensure adverse effects to historic properties are assessed per 36 CFR 800.5 and resolved through avoidance, minimization, or mitigation, per 36 CFR 800.6. To the extent practicable, the Permittee will develop or modify Project design and construction methods to avoid historic properties. For historic properties that cannot be reasonably avoided, the Permittee will submit assessments of effects and recommended resolution measures to the BLM as part of the Annual Fieldwork Report (VII.B.iii).
- i. The BLM shall ensure the Permittee, or contractors hired on their behalf, resolve all adverse effects that cannot be avoided or minimized through implementation of appropriate mitigation measures that are commensurate with the significance of the historic property and the Project's effect on the historic property. Proposed mitigation measures will be submitted to the BLM as part of the Annual Fieldwork Report (VII.B.iii) and approved mitigation measures will be fully developed as Treatment Plans (VII.B.iv), which the Permittee will be required to implement, following approval of the Plans. In certain cases, the BLM may determine that additional consultation is necessary to develop appropriate mitigation measures for certain historic properties. The Permittee will provide a Final Implementation Report (VII.B.v) to the BLM when mitigation is complete for each historic property.
 - ii. Approved mitigation measures may include, but are not limited to, the following list (see Attachment E, CRMP for additional details).
 1. Oral history interviews, placenames studies, GIS mapping, development of media, archival searches, and report preparation and publication; generally associated with properties eligible under Criterion A or B;
 2. HABS/HAER/HALS documentation or rehabilitation and reporting; generally associated with properties eligible under Criterion C;
 3. Data recovery and analysis, reporting, and curation of resulting collections and records; generally associated with properties eligible under Criterion D;
 4. Assisting in the development of Tribal or community historic preservation plans;
 5. Nominating and listing properties for the NRHP;

6. Public interpretation or public reports on regional history or prehistory;
 7. Providing improvements to or maintenance for historic trails;
 8. Creation of K-12 school curriculum or other projects for local schools related to the history or prehistory of the region; and
 9. Cultural resource management internship opportunities.
- iii. The BLM will generally consider approval of a Final Implementation Report (VII.B.v) to satisfy the requirements of 36 CFR 800.6 for each historic property. However, to account for potential Project modifications that could change the assessment of effects, the BLM shall ensure the criteria of adverse effect is applied using the most recent Phase Plan (IV.E) prior to providing the Permittee with written notification that the Section 106 requirements have been met.

G. Long-Term Considerations:

- i. After the initial inventory is completed, the PA Signatories may determine that mitigation measures are needed to account for broad-scale indirect or cumulative adverse effects to regional or national history and prehistory. Within 3 years following completion of initial inventory, the BLM will consult with the PA Signatories during the Annual Meeting (XV.A) to determine if broad-scale mitigation is appropriate, and if so, to identify measures for the Permittee to implement. The PA Signatories will also consider the Project's indirect and cumulative effects in advance of the Project transitioning from one Phase to another (see Attachment G, Project Plans).
- ii. If the Permittee expands, revises, or alters Project Segments, Components or footprints, and the area was inventoried more than 10 years prior, the BLM will consider whether the Permittee will be required to re-survey the area that would be affected by the changes, using methods determined appropriate by the BLM and other PA Signatories. The Permittee will provide any proposed changes in the Annual Work Plan (VII.B.i) and the BLM will consult with the Consulting Parties at the Annual Meeting (XV.A) to determine appropriate levels of effort for re-survey. Considerations should include environmental changes that occurred that could affect the identification of historic properties, resources that could have reached the 50-year threshold, new information that may be available regarding historic or traditional uses of the area, new survey methods or technology, or other factors.
- iii. Reevaluation of eligibility for listing in the NRHP may be necessary for certain cultural resources. The BLM will consult every 5 years with the Consulting Parties during the Annual Meeting (XV.A), or following substantive changes to Project Components or Phases, to determine if reevaluation of certain resources is necessary.
- iv. The BLM reserves the right to reevaluate the assessment of effects to historic properties if there are changes in design, construction methods, maintenance requirements, reclamation activities, or any other aspect related to the Undertaking that could adversely affect historic properties.

VIII. COLLECTION AND CURATION

- A.** Any materials¹² collected as a result of implementing this PA, and not subject to the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), are the property of the applicable state or federal land-managing agency, or landowner if collected from privately owned property. On federal lands, any human remains, funerary objects, sacred objects, or objects of cultural patrimony, as defined in 43 CFR 10.2(d), will follow disposition to lineal descendants or Tribe(s), following the procedures set forth in 43 CFR 10, Subpart B.
- B.** Pursuant to 36 CFR 79.7(b) and applicable permit(s), the Permittee will assume all costs associated with the curation of any materials that are collected during the implementation of this PA, in perpetuity. Curation costs may include, but are not limited to, curation fees charged by approved institutions, acquisition of archival materials, shipping, cleaning, rehousing, and any other conservation action determined necessary by a qualified conservator or considered common/ethical practice by the industry.
- C.** The BLM and the NPS shall ensure that curation of materials collected from federal lands, and not subject to the provisions of the NAGPRA, is completed in accordance with 36 CFR 79, *Curation of Federally-Owned and Administered Archaeological Collections*. The Permittee will submit all materials from federal lands for curation at the University of Alaska Museum of the North (UAM) in Fairbanks, Alaska, but the materials will retain federal ownership. During the permitting process, the Permittee will establish a provisional curation agreement with the UAM for collections, which the Permittee will finalize prior to submission of collections to the UAM.
- D.** Collections made on state land will comply with AS 41.35.020. The Permittee will submit all materials from state lands for curation at the UAM, but the materials will retain state ownership. During the State Archaeological Permitting process, the Permittee will establish a provisional curation agreement with the UAM for collections, which the Permittee will finalize prior to submission of collections to the UAM.
- E.** The Permittee, and any contractors hired on their behalf, will be responsible for submitting all materials recovered from state and/or federal lands to the UAM within 6 months following approval of the Final Implementation Report (VII.B.v), or within 1 year following completion of the fieldwork that generated the collection if the property will not require mitigation. All collections will be curation-ready, as determined by UAM requirements. Prior to disposition, the Permittee, or any contractors hired on their behalf, will safeguard all materials from theft or damage by providing appropriate interim storage facilities and conservation actions, consistent with the requirements in 36 CFR 79.9. The Permittee shall consult with UAM staff regarding interim storage facilities and necessary conservation actions to be consistent with 36 CFR 79.9 (b)(4). Within 30 days following disposition, the Permittee will provide the BLM with all accession records and documentation associated with the transfer and curation of materials. The BLM will share the documentation with other landowners or managers, as appropriate.
- F.** For collections recovered from private lands, the Permittee will work with private landowners to arrange for the disposition of materials. The Permittee will provide private landowners with information on the value of curation and will assume all costs of the materials, not to exceed standards set forth in 36 CFR 79. If a landowner chooses to donate

¹² The term “materials” is consistent with the definition found at 36 CFR 79.4(a)(1), and refers to any objects, artifacts, specimens, records, or remains associated with historic properties. This includes all documentation generated during the implementation of this PA, with the exception of information that is subject to confidentiality clauses of NHPA, ARPA, and/or Alaska State law.

or loan the materials to the UAM or another repository, the Permittee will provide the BLM with documentation of the transfer within 30 days following the transfer. In the event that a landowner chooses to retain a collection, the Permittee will provide documentation of this to the BLM.

IX. INITIATION OF CONSTRUCTION ACTIVITIES AND STOP WORK ORDERS

- A. The BLM shall ensure the Permittee does not initiate work on any Project Phase, Component, Stage, or Segment, until on-site actions to carry out the Alternative Four Step Process (VII) have been completed, and the BLM provides the Permittee with written notification that the Section 106 requirements have been met.
- B. The BLM may provide written notification to the Permittee, indicating that Section 106 requirements for individual Project Segments have been met, under the following conditions:
 - i. Project activities within that Segment would not restrict subsequent rerouting of other Segments or Components to avoid, minimize, or mitigate adverse effects to historic properties; and
 - ii. The BLM, in consultation with the PA Signatories, determines that all inventory has been completed and there are no historic properties within the APE for that Segment and that cultural resource monitoring or other methods will account for potential unknowns.
- C. The BLM may issue a Stop Work Order if it, or any PA Signatory, determines that Stipulation VII or IX.B has not been fulfilled, or if additional information regarding a historic property(ies) becomes available after the BLM notifies the Permittee that Section 106 requirements have been met. If a PA Signatory determines this, it shall notify the BLM in writing of the issue and the BLM shall subsequently issue a Stop Work Order to the Permittee. The BLM will then consult with the appropriate PA Signatories to determine what steps must be completed to allow for the work to be reinstated.
- D. Monitors have the authority to issue a Stop Work Order if there is an inadvertent discovery found during monitoring activities. See also Stipulation X, Monitoring; Stipulation XII, Inadvertent Discovery and Unanticipated Effects; and the CRMP, Attachment E.

X. MONITORING REQUIREMENTS

- A. Monitoring shall be required throughout the duration of this PA but may require differing levels of effort depending on the Project Phase, Component, or Stage. The BLM shall consult with Consulting Parties about where and to what extent monitoring will occur. At a minimum, the PA Signatories will consult regarding the need for monitoring during review of the Annual Work Plan (VII.B.i) and consider it during review of the Annual Fieldwork Report (VII.B.iii). The Permittee will ensure that monitoring plans are consistent with the Alaska Office of History and Archaeology Historic Preservation Series 15, *Monitoring Guidelines*. Additional details are provided in the CRMP, Attachment E.
- B. The BLM shall ensure the Permittee employs qualified Monitors and Supervisory Monitors, consistent with Stipulation I.B and the professional qualifications outlined in the Alaska Office of History and Archaeology Preservation Series No. 15 *Monitoring Guidelines*, to be present for Project work as determined necessary through consultation with the Consulting Parties. The Permittee must make opportunities available for Tribal liaisons/representatives to participate in monitoring, consistent with Stipulation IV.G.

Typical considerations for monitoring include but are not limited to: all ground-disturbing work within 500 feet of the boundary of a known historic property, within 1,000 feet of anadromous river crossings, and in high potential areas where testing may not have been adequate. Monitors may also be appropriate at historic properties previously subjected to data recovery, since there is a possibility for discovery of significant features or other cultural materials in previously unexcavated areas. Post-construction monitoring may be necessary to evaluate whether effects are occurring to historic properties that were avoided, whether historic properties are being indirectly or cumulatively affected, or to complete a reasonable and good faith effort in areas that were identified as high potential to encounter cultural resources. Monitors will be authorized to issue Stop Work Orders, consistent with Stipulation IX.D.

- C. The Permittee shall develop a Monitoring Plan, which will be updated annually. The Monitoring Plan will include, but not be limited to:
 - i. Areas to be monitored;
 - ii. Reporting requirements and schedule to track progress and results;
 - iii. Stop Work protocol for Monitors;
 - iv. Collection and curation protocols;
 - v. Hand signals for Monitors and equipment operators;
 - vi. Procedures and safety around heavy equipment; and
 - vii. Qualification standards and number of Monitors needed.
- D. The Permittee shall provide a Monitoring Plan to the BLM each year as part of the Annual Work Plan (VII.B.i). The Monitoring Plan will describe how Project activities during the upcoming year will be monitored. Consulting Parties will review the Monitoring Plan concurrently with the Annual Work Plan.
- E. The Permittee shall provide a Monitoring Report to the BLM each year as part of the Annual Fieldwork Report (VII.B.iii). The Monitoring Report will describe the results of the monitoring activities during the previous year. Consulting Parties will review the Monitoring Report concurrently with the Annual Fieldwork Report.

XI. CONTRACTOR TRAINING REQUIREMENTS

- A. The Permittee shall provide cultural resource awareness training to all Project personnel, contractors, and subcontractors on an annual basis. The training will inform Project personnel of their responsibilities under the law, and clearly list procedures to follow in the event that previously undiscovered cultural resources are encountered. Additional details are provided in Attachment E (CRMP).
- B. The Permittee is responsible for creating the training curriculum and shall make a good faith effort to seek input and collaborate with Tribes and other stakeholders to develop and teach the curriculum. Creation of the curriculum may be an iterative process. The Permittee will provide a copy of the curriculum to the BLM with the Annual Work Plan (VII.B.i), which will be shared with Consulting Parties for review and comment. The BLM will consider any timely comments received, and as necessary, require the Permittee to make changes and submit a revised version for review. The BLM and the SHPO will review the curriculum for approval, either within 15 days following the 30-day Consulting Party review, or within 15 days following receipt of any revisions. The curriculum must be approved by the BLM and the SHPO before it can be used for training purposes. The BLM will provide a copy of approved curriculum to the Consulting Parties for informational purposes.

- C.** It may be appropriate for contractors to receive differing levels of training depending on Project Phase or job role. The BLM, along with Consulting Parties, will evaluate the effectiveness of the curriculum at the Annual Meeting and determine if modifications should be made to improve or clarify content. The Permittee may provide training suggestions based on contractor roles and responsibilities at different stages of the Project.
- D.** At a minimum, the curriculum will provide information on the following topics:
- i. Traditional cultural practices and subsistence uses along the Project corridor;
 - ii. Legal context for cultural resources protection and applicable federal, state, and local laws;
 - iii. Penalties for disturbing cultural resources and human remains;
 - iv. Cultural resources likely to be found in the Project area;
 - v. Monitoring procedures, including safety around heavy equipment, buffer areas, and hand signals between monitors and equipment operators;
 - vi. The Inadvertent Discovery of Cultural Resources Plan (Exhibit A of the CRMP, Attachment E); and
 - vii. The Inadvertent Discovery of Human Remains Plan (Exhibit B of the CRMP, Attachment E).

XII. INADVERTENT DISCOVERY AND UNANTICIPATED EFFECTS

- A.** The Permittee shall ensure that the Inadvertent Discovery of Cultural Resources (IDCR) Plan, found in Exhibit A of the CRMP, is implemented if there is an inadvertent discovery of a cultural resource(s) during any Project-related work.
- B.** The Permittee shall ensure all project personnel receive training on the IDCR Plan as part of Stipulation XI, Contractor Training Requirements, shall make the Plan available to all Project personnel, and shall ensure that all worksite supervisors have copies of the Plan with them at the worksite. The Permittee or their designee (such as worksite supervisors) is responsible for ensuring the following 2 steps are immediately implemented following an inadvertent discovery (refer to the IDCR Plan for full details):
 - i. **Stop Work** – as soon as it is safe to do so, work will cease in the immediate vicinity of the discovery and a 100-foot radius buffer around the discovery will be flagged or fenced off. The discovery must be secured and protected from further disturbance to the extent possible.
 - ii. **Notify Officials** – as soon as possible following discovery, and no later than 1 business day, the Permittee or their designee will notify the BLM, the SHPO, and the landowner or manager of the discovery (contacts are listed in the IDCR Plan).
- C.** Within 5 business days of notification, the BLM, the SHPO, the Permittee, landowner or manager will consult by telephone or other means on the nature of the discovery and potential significance and determine if any additional investigation is warranted or if other parties should be notified. The resource(s) will be treated as eligible until a full assessment of eligibility can be completed.
- D.** If the BLM determines through consultation with the other parties that the discovery is not significant and the SHPO concurs, the BLM shall provide the Permittee with written authorization to proceed with construction activities within 1 business day of this determination and concurrence.
- E.** If the BLM determines that additional investigation is warranted, the Permittee shall ensure the discovery is investigated by a professional meeting Stipulation I, Standards, to evaluate for NRHP eligibility. The field investigation and DOE report will be completed within 10 days following the BLM's determination. The BLM will consult with the SHPO, and other Consulting Parties as appropriate, on the eligibility of the discovery, within 3 business days of receipt of the DOE. The SHPO will provide a determination to the BLM within 5 business days from consultation. If no response is received within 5 business days, the BLM will move forward with their determination.
- F.** If the discovery is determined eligible, and the Project cannot avoid further effects or has already caused an adverse effect, the Permittee will prepare a Treatment Plan based on mitigation measures developed in the CRMP, Attachment E, and modified to fit the affected historic property. The Permittee will submit the Plan to the BLM within 5 business days of the end of the SHPO comment period. The BLM will distribute the Plan to the other Consulting Parties as appropriate, for a 5 business-day review. The BLM will take into consideration any timely comments received, and require any changes to be incorporated, before approving of the Treatment Plan. The Permittee must implement the on-site measures of the Treatment Plan and receive written notification from the BLM that on-site Section 106 requirements have been met for the discovery, prior to Project activities resuming.

- G. The Permittee will report on any discoveries, and the actions that were taken to resolve them, as part of the Annual PA Report (XV.B). The Permittee will also provide a Final Implementation Report to the BLM before moving forward.

XIII. TREATMENT OF HUMAN REMAINS

- A. The Permittee shall ensure that the Inadvertent Discovery of Human Remains (IDHR) Plan, found in Exhibit B of the CRMP, Attachment E, is followed if human remains are discovered during Project work, regardless of cultural origin or age, and also including funerary objects, sacred objects, or objects of cultural patrimony, as defined in 43 CFR 10.2(d).
- B. The Permittee shall ensure all project personnel receive training on the IDHR Plan as part of Stipulation XI, Contractor Training Requirements, shall make the Plan available to all Project personnel, and shall ensure that all worksite supervisors have copies of the Plan with them at the worksite. The Permittee or their designee (such as worksite supervisors) is responsible for ensuring the following steps are immediately implemented following an inadvertent discovery (refer to the IDHR Plan for full details):
 - i. Stop Work – As soon as it is safe to do so, work will cease in their immediate vicinity of the discovery and a 100-foot radius buffer will be flagged or fenced off to protect the remains. The remains will be treated with dignity and respect and covered or protected from further disturbance;
 - ii. Notify Officials – The Permittee will immediately notify, and no later than 1 business day, the Alaska State Troopers, the Alaska State Medical Examiner, local law enforcement, and the Alaska State Troopers/Missing Persons Clearinghouse as stipulated in AS 12.65.005. The Permittee will also notify the BLM, the landowner/manager, the SHPO, and Tribes of discovery per the contact list in the IDHR Plan.
- C. The PA Signatories will defer to local law enforcement or the Alaska State Troopers for a determination of whether the remains are of a forensic nature and/or subject to criminal investigation. Remains that are of a forensic or criminal nature will no longer be subject to the terms of this PA.
- D. If the discovery is on private or state lands, the Permittee will be responsible for facilitating consultation among the BLM, the SHPO, landowner, and Tribes to determine appropriate treatment, removal, and/or disposition measures for the remains or objects. The Permittee is responsible for covering costs associated with the consultation and treatment, removal, and disposition measures.
- E. If the discovery is on federal lands, and includes human remains, funerary objects, sacred objects, or objects of cultural patrimony, the managing agency (the BLM or the NPS) will follow the provisions of the NAGPRA, pursuant to 25 USC 3001 et seq., and the implementing regulations found at 43 CFR 10.4(d). The managing agency will consult with the appropriate Tribe(s) and develop a plan of action within 30 days, as required by 43 CFR 10.5. Consultation for the plan of action will determine appropriate treatment of the remains or objects and a course of action for excavation, custody, and other factors, to complete the disposition process. The Permittee is responsible for covering costs associated with the development of the plan of action and the disposition of the remains or objects.

- F. Project construction that would not affect the discovery site may continue, as directed by the BLM through written notification to the Permittee, while documentation and assessment of the human remains at the discovery site proceeds and/or while the NAGPRA plan(s) of action is developed. When the BLM determines that the protocols outlined in the IDHR Plan have been followed, and that compliance with state and federal cultural resources laws has been completed, the BLM will provide the Permittee with written notification that the requirements have been met, and that Project activities may resume at the discovery site.
- G. The Permittee will report on any discoveries, and the actions that were taken to resolve them, as part of the as part of the Annual PA Report (XV.B).

XIV. DOCUMENT SUBMISSION AND REVIEW

- A. Consistent with the terms and conditions of this PA, the Permittee will prepare numerous document deliverables that will require review by the PA Signatories. These deliverables will include summaries, plans, reports, and curriculum, referred to collectively as “reports”; additional details for reporting are provided in the CRMP, Attachment E. All required reports for PA implementation are displayed in tabular format in Attachment F, Reporting Table.
- B. The review, comment, and approval process for all reports will follow the same steps (unless otherwise described) and are cross-referenced with columns in Attachment F, Reporting Table, as follows:
 - i. The Permittee will submit the report to the BLM within the specified timeframe (Submittal Due).
 - ii. Within 7 business days of receipt, the BLM will submit the report to the Consulting Parties for a review and comment period, which will occur within the timeframe specified (Review Period).
 - iii. If no comments are during the Review Period, the BLM will move forward with the report. If timely comments are received, the BLM will consider them and require the Permittee to incorporate changes to the report, and (if necessary) submit a revised version to the BLM within 30 days.
 - iv. Within 7 business days of receipt of revised reports, the BLM will submit them to agencies for approval within the timeframe specified (Required Report Approvals). If approval of a report is denied for any reason, the party must notify the BLM of this in writing during the review period and provide information regarding the necessary corrections to allow for approval of that report. The BLM will then direct the Permittee to make the necessary changes and then resubmit the revised report to that party for approval.
 - v. After approval, the BLM will share the final version of reports with Consulting Parties for informational purposes.
 - vi. The BLM will append finalized Annual Work Plans, Monitoring Plans, and Treatment Plans to Attachment G, Project Plans, consistent with Stipulation XVII.B.iii.
- C. Any Consulting Party may submit a request in writing to the BLM for an additional 30-day extension for report review and comment periods. The Permittee may also submit a request

in writing to the BLM for up to a 30-day extension on report submission deadlines. All requests will be considered, and the BLM will notify the other PA Signatories and Consulting Parties as appropriate, if a request is granted. Deadline extensions will not require an amendment.

- D.** The Permittee may be required by the BLM to redact versions of reports for sensitive information, such as site-specific locations and names, in order for the BLM to distribute the reports to Consulting Parties who do not fall under the applicable professional qualification standards set forth in Stipulation I, Standards, and the public.

XV. AGREEMENT TRACKING AND MONITORING

- A.** Annual Meeting – The BLM will facilitate an Annual Meeting among the Consulting Parties, no later than March 31 of each year, to consult on the previous year’s activities and the activities scheduled for the upcoming year. Items to be discussed at the Annual Meeting may include, but are not limited to:

- i. The Permittee will provide detailed descriptions or presentations on work that occurred over the past year, including the following:
 1. Construction, operations, or maintenance activities;
 2. Inventory work within the APE, including consultation, archival research, and field survey;
 3. Cultural resources identified and evaluated;
 4. Historic properties assessed for effects and resolution measures implemented (or proposed); and
 5. Monitoring results;
- ii. The Permittee will provide detailed descriptions or presentations on work that will occur over the upcoming year, including the following:
 1. Any changes to Phase Plans and whether that may change inventory, evaluation, assessment, or resolution requirements, per the PA;
 2. Construction, operations, or maintenance activities and schedules;
 3. Planned Inventory work within the Direct APE;
 4. A schedule for activities;
 5. Contractor Training Curriculum, effectiveness and/or modification; and
 6. Other plans or descriptions of how the Permittee will meet PA terms and conditions;
- iii. The BLM, together with the other PA Signatories, will consider:
 1. Whether each agency (BLM, NPS, USACE, State) has met its respective responsibilities under the PA and any possible issues of non-compliance;
 2. PA and CRMP effectiveness and amendments, revisions, or addendums, as necessary;
 3. The APE and revisions, as necessary;
 4. Inventory needs within the Indirect APE;
 5. Need for re-inventory, reevaluation of eligibility, or assessment of effects if Projects footprints or plans change;
 6. Monitoring needs, results, and effectiveness;
 7. The need for Project-wide mitigation to account for indirect or cumulative effects;

8. The need for Technical Reports, Construction and Operations Summary Reports, or Reclamation and Project Closure Report;
 9. PA requirements that have been completed in full; and
 10. Feasibility of timelines;
- iv. The BLM will share non-sensitive information gathered during consultation that may be relevant to implementation of the PA and any updates to the Contact List or Maps.
- B.** Annual PA Report – The Permittee will provide an Annual PA Report to the BLM, no later than March 1 each year. This report will summarize all activities resulting from PA implementation over the previous year. The BLM will submit the Annual PA Report to the Consulting Parties at least 15 days prior to the Annual Meeting. Consulting Parties will have a 30-day review and comment period for the Annual PA Report, which will follow the steps described in Stipulation XIV, Document Submission and Review. After review by the Consulting Parties, the Report will be made available to the public, consistent with Stipulation (V.F). Additional details are discussed in the CRMP, Attachment E.
- C.** Summary Construction and Operations Reports – The BLM shall ensure the Permittee provides summary Construction and Operation Reports, to assist with tracking the implementation of the PA within 2 years following completion of construction for Phases I, II, and III, and/or every 10 years. At least 1 year before the report is due the BLM will consult with the PA Signatories during the Annual Meeting, to determine additional required report content, due date, and review schedule. The Construction and Operation Reports will, minimally, include a summary of the work that has occurred during that Phase or period, the resources found, measures implemented, changes and updates in project designs/plans, changes in management or roles, and other relevant information. Some or all of the content may be summarized from the Annual Work Plans, Annual Fieldwork Reports, Annual PA reports, or other reports and documents. The Permittee will provide the report to the BLM within the determined timeframes, and the BLM will share the report with Consulting Parties for, minimally, a 30-day review and comment period which will follow the steps described in Stipulation XIV, Document Submission and Review.
- D.** Summary Reclamation and Closure Report – The BLM shall ensure the Permittee provides a summary report at the conclusion of the reclamation and closure Phase of the Project. The required content and due date will be determined through consultation with the PA Signatories and will be provided to the Permittee at least 2 years before the report is due.
- E.** If any PA Signatory deems an additional meeting with the other PA Signatories is necessary in addition to the Annual Meeting described above, that party shall inform the BLM in writing. The BLM shall consider all requests and will inform the other PA Parties if the BLM determines that the additional meeting is necessary.
- F.** Any of the PA Signatories or Concurring Parties may request informal meetings with the BLM, or other parties, regarding the implementation of the PA without requiring notification of the other PA Signatories. However, no changes or decisions regarding the implementation of the PA can be made without following Stipulation XVII, Amendments and Addendums, with the exception of requests to extend report submission or review deadlines (XIV.C).

- G.** The BLM will ensure that no less than every 5 years, the PA is reviewed with the Consulting Parties to evaluate the efficacy and consider changes, if necessary.
- H.** If the Project is delayed or put on hold at any stage for more than 12 consecutive months, the Permittee will be responsible for funding all costs associated with re-familiarizing all Consulting Parties with the Project, the Section 106 process, the PA Stipulations, and any work that has already occurred under the terms of the PA. The BLM shall ensure this effort includes, but is not limited to, sending notification letters to the Consulting Parties to notify them that the Project will be moving forward and provide a brief summary of the PA implementation to date; facilitation of 1 or more meetings with Consulting Parties; and facilitation of 1 or more meetings among the PA Signatories to discuss PA implementation work to date and consider any necessary revisions to the PA and CRMP, and to ensure all parties are informed of their responsibilities under the terms of the PA; and any in-person consultation between the BLM and Tribes. The Permittee will provide at least 60 days advance notice to the BLM to ensure these steps can be adequately accomplished.

XVI. DISPUTE RESOLUTION

- A.** Should any PA Signatory object at any time to any proposed work or the manner in which the terms of this PA are implemented, the BLM shall consult with the party to resolve objection. If the BLM determines that such objection cannot be resolved, the BLM will:
 - i.** Forward all documentation relevant to the dispute, including the BLM's proposed resolution, to the ACHP. The ACHP shall provide the BLM with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the BLM shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, PA Signatories, and Consulting Parties, and will provide the parties with a copy of the written response. The BLM will then proceed according to its final decision.
 - ii.** If the ACHP does not provide its advice regarding the dispute within the 30-day time period, the BLM may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the BLM shall prepare a written response that takes into account any timely comments received from the PA Signatories and Consulting Parties regarding the dispute and provide those parties and the ACHP with a copy of such written response.
- B.** The BLM's responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

XVII. AMENDMENTS AND ADDENDUMS

- A.** Any PA Signatory may request an amendment to the PA by providing the proposed changes in writing to the BLM. The BLM will notify all Consulting Parties of the proposed amendment and consult with them to reach agreement within 30 days. The amendment will be effective on the date the amendment is signed by the Signatories and filed with the ACHP. If the amendment is not signed within 60 days of receipt, the BLM will reinstate consultation for another 30 days. If the Signatories do not agree to the amendment, the BLM will determine that the PA will stand as is.
- B.** PA Attachments may be amended with a streamlined process as follows, except for Attachments A, E, and G. Any PA Signatory may propose an amendment to an Attachment by submitting a request in writing to the BLM. If the BLM concurs that the amendment

improves or updates the Attachment(s), the BLM will share the proposed amendment with the Consulting Parties for a 30-day review and comment period. If no comments are received at the end of the review period, the BLM will move forward with the proposed amendment and will provide Consulting Parties with a revised version of the Attachment(s).

- i. The BLM may revise Attachment A, Maps, at any time without necessitating an amendment. The BLM will notify the Consulting Parties of any updates and provide the revised version of Attachment A at the Annual Meeting (XV.A).
 - ii. Attachment E, CRMP, may be updated without necessitating a PA amendment, but requires written approval from the BLM, the SHPO, and the NPS in a revised version of Exhibit F (Signature Page for CRMP Finalization). Any PA Signatory may propose an amendment to the CRMP by submitting a request in writing to the BLM. If the BLM concurs that the amendment improves or updates the CRMP, the BLM will share the proposed amendment with the Consulting Parties for a 30-day review and comment period. The BLM will consider all timely comments received, in consultation with the SHPO and the NPS, and incorporate changes. The BLM will send a revised version of the CRMP to the Consulting Parties following written approval. If a Consulting Party objects to the changes, the BLM will follow the steps in Stipulation XVI, Dispute Resolution.
 1. The BLM may update CRMP Exhibit D (Mapbook of AHRS Sites within the APE) and Exhibit E (Contact List) at any time without necessitating written approval from the BLM, the SHPO, and the NPS. The BLM will provide any revisions to the Exhibit(s) at the Annual Meeting (XV.A).
 - iii. The BLM may append documents to Attachment G, Project Plans, at any time without necessitating an amendment, as long as the documents are required by and/or developed under the terms of the PA, such as Phase Plans, Annual Work Plans, Monitoring Plans, and Treatment Plans, and the addition is documented in Attachment H, Amendment and Addendum Log. Final reports do not need to be appended to the PA.
- C. The BLM will document all amendments and addendums to the PA in Attachment H, Amendment and Addendum Log. The BLM will provide revised versions of the PA or PA Attachments to the Consulting Parties within 30 days of finalization, unless otherwise noted.

XVIII. TERMINATION

- A. If any of the PA Signatories determine that its terms will not or cannot be carried out, that party shall immediately consult with the other PA Signatories to attempt to develop an amendment per Stipulation XVII, above. If, within 30 days (or another time period agreed to by all PA Signatories), an amendment cannot be reached, any PA Signatory may terminate the PA upon written notification to the other PA Signatories.
- B. Once the PA is terminated, and prior to work continuing on the Undertaking, the BLM must either (a) execute a Memorandum of Agreement pursuant to 36 CFR 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. The BLM shall notify the Consulting Parties as to the course of action it will pursue.

XIX. FINANCIAL SECURITY

- A. The Permittee will post a financial instrument approved under the ROW regulations (43 CFR 2800) with the BLM in an amount sufficient to cover all post-fieldwork costs associated with implementing the PA, or other mitigative activities such as data recovery, curation, and report completion, as negotiated by the Permittee where they contract for services in support of this PA.
- B. The BLM will determine through consultation with the other PA Signatories the extent and duration of additional data collection activities and analysis, taking into account the need for completing post-fieldwork activities, should the Permittee abandon the Project.

XX. ANTI-DEFICIENCY ACT

The BLM's obligations under this PA are subject to the availability of appropriated funds, and the stipulations of this PA are subject to the provisions of the Anti-Deficiency Act. The BLM shall make reasonable and good faith efforts to secure the necessary funds to implement this PA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the BLM's ability to implement the stipulations of this agreement, the BLM shall consult in accordance with the amendment and termination procedures found at Stipulations XVII and XVIII of this PA.

XXI. DURATION OF THIS PA

- A. Unless otherwise amended or terminated in accordance with Stipulation XVII or XVIII, this PA will expire 25 years from the date of Execution.
- B. The Project is proposed to last 50 years, but because Project design plans are not fully developed at this time, this PA cannot account for all anticipated effects. The PA Signatories recognize that an amended extension of this PA or another agreement document will be needed to ensure compliance with the NHPA throughout the Operations and Maintenance and Reclamation Phases of the Project. Therefore, at least 2 years prior to expiration, the PA Signatories will consult to determine whether a new PA will be developed or if this PA will be amended and extended.
- C. The BLM and Consulting Parties will review all sections of this PA every 5 years and at shifting of Project Phases to update outdated statutes, best practices, and contact information, and to consider whether organizations who may have originally declined participation may wish to participate as a Consulting Party. If the BLM determines the PA needs to be updated, the BLM will notify the PA Signatories, Consulting Parties, and other interested parties and invite them to consult on the proposed changes. Amendments to the PA would be consistent with Stipulation XVII, Amendments and Addendums.

EXECUTION of this PA by the BLM, the SHPO, and the ACHP, and implementation of its terms, evidences that the BLM has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

This PA may be executed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. The BLM may consolidate the original signature pages to produce the final copies. The BLM will distribute copies of all pages to all Consulting Parties once the PA is signed.

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

SIGNATORY

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT

By: 

(Chad Padgett, State Director, BLM Alaska)


DATE: 4/17/2020

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

SIGNATORY

***ALASKA STATE HISTORIC PRESERVATION OFFICER**

By:



(Judith Bitner, State Historic Preservation Officer, Alaska State Historic Preservation Office)

DATE:

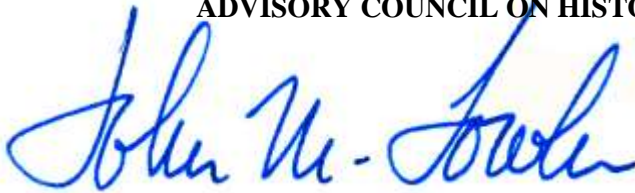


April 23, 2020

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

SIGNATORY

ADVISORY COUNCIL ON HISTORIC PRESERVATION



By: _____

(John M. Fowler, Executive Director, Advisory Council on Historic Preservation)

DATE: April 27, 2020

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

INVITED SIGNATORY

ALASKA INDUSTRIAL DEVELOPMENT AND EXPORT AUTHORITY




By: _____
(Mark R. Davis, Chief Infrastructure Development Officer)

DATE: 5/5/20

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

INVITED SIGNATORY

ALASKA DEPARTMENT OF NATURAL RESOURCES

By:  _____
(Corri A. Feige, Commissioner)

DATE: 4/27/2020

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

INVITED SIGNATORY

U.S. ARMY CORPS OF ENGINEERS

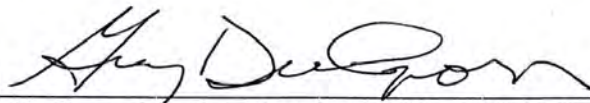
By: _____
(Shannon Morgan, Chief North Branch)

DATE: _____

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

INVITED SIGNATORY

U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE

By: 

(Greg Dudgeon, Superintendent, Gates of the Arctic National Park and Preserve)

DATE: 04/23/2020

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

ALATNA VILLAGE COUNCIL

By: _____
(Harding Sam, First Chief)

DATE: _____

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

ALLAKAKET VILLAGE COUNCIL

By: _____
(Elsie Bergman, First Chief)

DATE: _____

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

CITY OF ALLAKAKET

By: _____
(Crystal Bergman, Mayor)

DATE: _____

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

EVANSVILLE, INCORPORATED

By: _____
(Frank Thompson, First Chief)

DATE: _____

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
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ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

EVANSVILLE VILLAGE

By: _____
(Dave Anderson, President)

DATE: _____

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

NATIVE VILLAGE OF KOBUK

By: Henry Horner Sr
(Henry Horner, President)

DATE: 04/24/20

**PROGRAMMATIC AGREEMENT
BY AND AMONG THE
BUREAU OF LAND MANAGEMENT,
ALASKA STATE HISTORIC PRESERVATION OFFICER, AND
ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE
AMBLER MINING DISTRICT INDUSTRIAL ACCESS ROAD, ALASKA**

CONCURRING PARTY

NORTHWEST ARCTIC BOROUGH

By:  _____
(Lucy Nelson, Mayor)

DATE: April 22, 2020

DEFINITIONS

ACHP (Advisory Council on Historic Preservation) – The ACHP is an independent federal agency that promotes the preservation, enhancement, and productive use of our nation’s historic resources, and advises the President and Congress on national historic preservation policy. The National Historic Preservation Act (NHPA) gives the ACHP the legal responsibility to assist federal agencies in their efforts and to ensure they consider preservation during project planning.

Adverse Effect – An adverse effect is found when an Undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places (NRHP) in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the Undertaking that may occur later in time, be farther removed in distance, or be cumulative. The term is consistent with the definition found at 36 CFR 800.5(a)(1), and may include, but is not limited to, the effects described at 36 CFR 800.5(a)(2).

AIDEA (Alaska Industrial Development and Export Authority) – AIDEA is the Project proponent and Permittee. AIDEA is a public corporation of the State of Alaska, created in 1967 by the Alaska Legislature “in the interests of promoting the health, security, and general welfare of all the people of the state, and a public purpose, to increase job opportunities and otherwise to encourage the economic growth of the state...”

APE (Area of Potential Effects) – The APE geographic area or areas within which an Undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an Undertaking and may be different for different kinds of effects caused by the Undertaking.

Archaeological Sensitivity Model – This is a Geographical Information System model capable of identifying resource potential for prehistoric, protohistoric, and early historic archaeological resources left behind by Native Alaskans within the Direct and Indirect APE. The Model will be developed following selection of a preferred alternative. The Model does not predict site location but will identify areas that have high, medium, or low potential for these types of sites. The results of the Model will be integrated into the Survey Strategy.

Component/Project Component – The Project, as proposed, would include construction of bridges, material sites, maintenance stations, airstrips, and related ancillary features, which are referred to as Components.

Concurring Party – In accordance with 36 CFR 800.6(c)(3), a concurring party is a Consulting Party invited to sign the PA but who does not have the authority to amend or terminate the agreement. A concurring party signature is not required to execute the agreement.

Construction Phases – The Permittee has proposed building the Project in 3 Phases:

Phase I Construction of Seasonal Pioneer Road: This Phase would overlap with the Pre-Construction Phase and will occur during years 2 to 4 of the Project. The Pioneer Road is proposed as a single-lane seasonal road with embankment width up to 28 feet and height 30 to 72 inches, 12-foot road lane, 2-foot shoulders, and 1-way operation for up to 7 months per year. This Phase would include clearing vegetation from the federal and state right of ways while other right-of-way negotiations are underway. Other activities associated with this Phase include construction of material sources, clearing and preparing construction camps, placement of radio towers, staging of equipment and labor in various areas, hauling materials and placing fill, excavating high areas, and

grading. It would also include installation of culverts and bridges (including driving piles for bridge supports) as well as airstrips, maintenance facilities, and access controls.

Phase II Construction of All Season Roadway: This Phase, occurring during years 3 to 4 of the Project (including overlap with Phase I) would involve the construction of a year-round useable road and would include additional material extraction, hauling and placing material to expand the Phase I embankment (width and depth), and grading to final slopes. Fiber optic facilities would be trenched into the road embankment during this Phase.

Phase II Operations and Maintenance of the Constructed Phase II Roadway: This Phase, occurring from years 4 to 50, includes continued development or expansion of material sites, air operations, maintenance station operations, hauling materials and placing fill for repairs/maintenance, grading, and removal and reclamation of temporary construction camps not turned into maintenance stations.

Phase III Construction of 2-Lane Road: Phase III, if needed, would include additional clearing, additional material extraction, additional excavation where widening road in cut sections or side hilling, additional hauling and placing materials to expand the Phase II embankment (width), and additional grading. Culverts would be extended by welding extensions onto existing culverts. The expansion would create a 2-lane all-season roadway. The road widening effort would take 2 to 3 years to complete.

Consultation – The process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process.

Consulting Party – Any group, entity, or person that has a demonstrated interest in the Undertaking and has participated in the PA development or has indicated they wish to participate in the Section 106 process. This includes Tribes, agencies, local governments, nonprofit organizations, and the Permittee.

CRM (Cultural Resources Management) – CRM is the practice of cultural heritage management within a framework of federal, state, and local laws, regulations, and guidelines.

CRMP (Cultural Resources Management Plan) – A CRMP is a document drafted to guide compliance and consideration of cultural resources during implementation of a project or to assist a landowner or land manager.

Cultural Resource – Archaeological, historical or architectural resources, structures, or places that may exhibit human activity or occupation and/or may be places of religious, spiritual, or cultural significance to Tribes, or meet the criteria of a Traditional Cultural Property (TCP) (BLM Manual 8100).

Cumulative Effects – Cumulative effects result from incremental actions, that when added to other past, present, and reasonably foreseeable future actions, may adversely affect a historic property.

Curation – Refers to the process of selecting and caring for archaeological or cultural materials to be provided to a museum or landowner for future research, exhibit, or instruction. Curation procedures will follow University of Alaska Museum of the North's *Curation Guidelines* (UAM Curation Guidelines and 36 CFR 79).

Direct Effects – Direct effects include physical destruction or damage, alteration that is not consistent with 36 CFR 68, removal of a property from a historic location, change in the character of use or physical features that contribute to the historic significance, deterioration through neglect, or introduction of visual, atmospheric, or audible elements that diminish the integrity of a property's significant historic features. This includes, but is not limited to, the effects identified in 36 CFR 800.5(a)(2).

DOE (Determination of Eligibility) – A DOE is an evaluation of whether a property is eligible for listing in the NRHP, following guidance provided in the National Park Service Bulletin 15 *How to Apply the National Register Criteria for Evaluation*.

Effect – See Adverse Effect.

Execution – Refers to the date the PA goes into effect and is defined as the date that the last Signatory signs the document and it is filed with the ACHP. At that point, the PA is considered executed.

Field Crew Chief – Archaeologist who oversees and coordinates an archaeological field crew in locating, collecting, recording, and interpreting data during archaeological survey and excavation. The Field Crew Chief must have at least 2 years of supervisory experience conducting archaeological fieldwork in Alaska or have partaken in a cultural resource training/shadowing program prior to taking on the Field Crew Chief role.

GAAR (Gates of the Arctic National Park and Preserve) – The northernmost national park in the U.S., GAAR protects portions of the Brooks Range. It was initially designated a national monument in 1978. After passage of the Alaska National Interest Lands Conservation Act in 1980, it was re-designated as a national park and preserve.

Historic Property – Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious, spiritual, or cultural importance to a Tribe and that meet the NRHP criteria.

Indirect Effects – Indirect effects to historic properties are those caused by an Undertaking that are later in time or farther removed in distance but are still reasonably foreseeable.

Inventory – The term “inventory” is used throughout this document to refer to all efforts to compile information on historic properties, including consultation, archival research, and fieldwork. The term is similar to survey, but “survey” is used throughout this document to refer to inventory efforts that are field based only.

Invited Signatory – The State of Alaska, National Park Service, U.S. Army Corp of Engineers, and the Alaska Industrial Development and Export Authority are Invited Signatories to this PA. In accordance with 36 CFR 800.6(c)(2), Invited Signatories have the same rights with regard to seeking amendment or termination of the PA as the Signatories. The refusal of an Invited Signatory to sign the PA does not prevent the agreement from being executed.

Materials – The term “materials” refers to any objects, artifacts, specimens, records, or remains associated with historic properties, consistent with the definition found at 36 CFR 79.4(a)(1). This includes all documentation generated during the implementation of this PA, with the exception of information that is subject to confidentiality clauses of NHPA, Archaeological Resources Protection Act, and/or Alaska State law.

Monitor – Archaeologist who observes ground-disturbing/excavation activities in order to identify, recover, protect, and/or document archaeological information or materials that are unearthed during these activities. The Monitor has stop-work authority and must have a bachelor’s degree in Archaeology or closely related field, plus at least 1 year of experience conducting archaeological fieldwork in Alaska.

NHPA (National Historic Preservation Act) – The NHPA, 54 USC 300101 to 307108, is the primary federal law governing the preservation of historic resources in the U.S. The law established a national

preservation program and a system of procedural protections which encourage the identification and protection of historic resources of national, state, tribal and local significance.

NRHP (National Register of Historic Places) – The NRHP is the official list of the Nation’s historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America’s historic and archeological resources.

PA (Programmatic Agreement) – A document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex Undertaking or other situations in accordance with 36 CFR 800.14(b).

PA Signatories – This term is used in the PA to collectively mean the Signatories and Invited Signatories.

Permittee – The Permittee is AIDEA and any heirs, successors, assigns, joint ventures, and any contractors acting on behalf of the Permittee; all of whom are bound by the terms of this PA.

Pre-Construction Phase – This Phase includes those activities required to complete permitting and design, such as: geotechnical investigations at bridge locations, along the corridor centerline to refine the embankment design, and at material sites along the east-end alignment; aerial imagery and LiDAR (and/or survey) for areas lacking coverage; wetland delineation on areas not field delineated; hydrology studies; and cultural resources surveys. No Components will be installed as part of this Phase. Years 1 and 2 may overlap with Phase I Construction timing.

Project – All aspects, including those not currently defined but may be defined in the future for the Ambler Mining District Industrial Access Road.

Project Field Plans – A planning tool for deployment of field crews during the entire field season, based on output for site potential value (high, medium, low) and the Survey Strategy.

Reclamation Phase – This Phase of the Project would occur at the end of the Project and would include removal of embankment, culverts, airstrips, and maintenance sites, as well as regrading and revegetation. All Components would be removed at end of reclamation.

ROD (Record of Decision) – The ROD is a statement issued by the Lead Federal Agency that informs the public of the agency’s decision, the agency’s rationale for it, and any mitigation measures the agency will carry out for significant impacts. The ROD will govern whether permits are issued for a project to move forward.

Section 106 – Section 106 of the NHPA of 1966 requires federal agencies to consider the effects of projects they carry out, assist, fund, permit, license, or approve throughout the country (known as “Undertakings”) on historic properties. The Section 106 process requires federal agencies to identify historic properties, assess effects on those properties, and resolve adverse effects through avoidance, minimization, or mitigation. Section 106 gives the ACHP, interested parties, and the public the chance to weigh in on these matters before a final decision is made. The ACHP has issued regulations, 36 CFR 800, which guide how agencies should fulfill this responsibility.

Segments/Project Segments – Geographical sections of the Project (e.g., milepost 32 to 35).

Sensitive information – This is defined in the NHPA as including information about the location, character, or ownership of a historic property if disclosure to the public may cause a significant invasion of privacy, risk harm to the historic property, or impede the use of a traditional religious site by practitioners (54 USC 307103).

SHPO (State Historic Preservation Officer) – Every state and U.S. Territory has a SHPO who, with the support of qualified staff, is charged with: conducting a comprehensive survey of historic properties; maintaining an inventory of historic properties; identifying and nominating eligible properties for the NRHP; advising and assisting Federal, State and local governments in matters of historic preservation; preparing and implementing a statewide historic preservation plan; providing public information, education, training, and technical assistance; and providing consultation for Federal Undertakings under the Section 106 provision of the National Historic Preservation Act.

Signatory – The BLM, SHPO, and ACHP are Signatories to this PA. In accordance with 36 CFR 800.6(c)(1), the Signatories have sole authority to execute the PA. The Signatories, along with the Invited Signatories, can amend or terminate the PA.

Stages/Project Stages - Specific construction steps or activities that would occur within each Project Phase or Component (e.g., survey, geotechnical drilling, etc.).

Supervisory Monitor – Secretary of Interior-qualified archaeologist who is present at the job site for the duration of the monitoring program. Conducts monitoring and/or supervises historic properties monitors on-site. The Supervisory Monitor has stop-work and start-work authorities. Must have a master's degree in Archaeology or closely related field, plus at least 1 year of supervisory experience conducting archaeological fieldwork in Alaska.

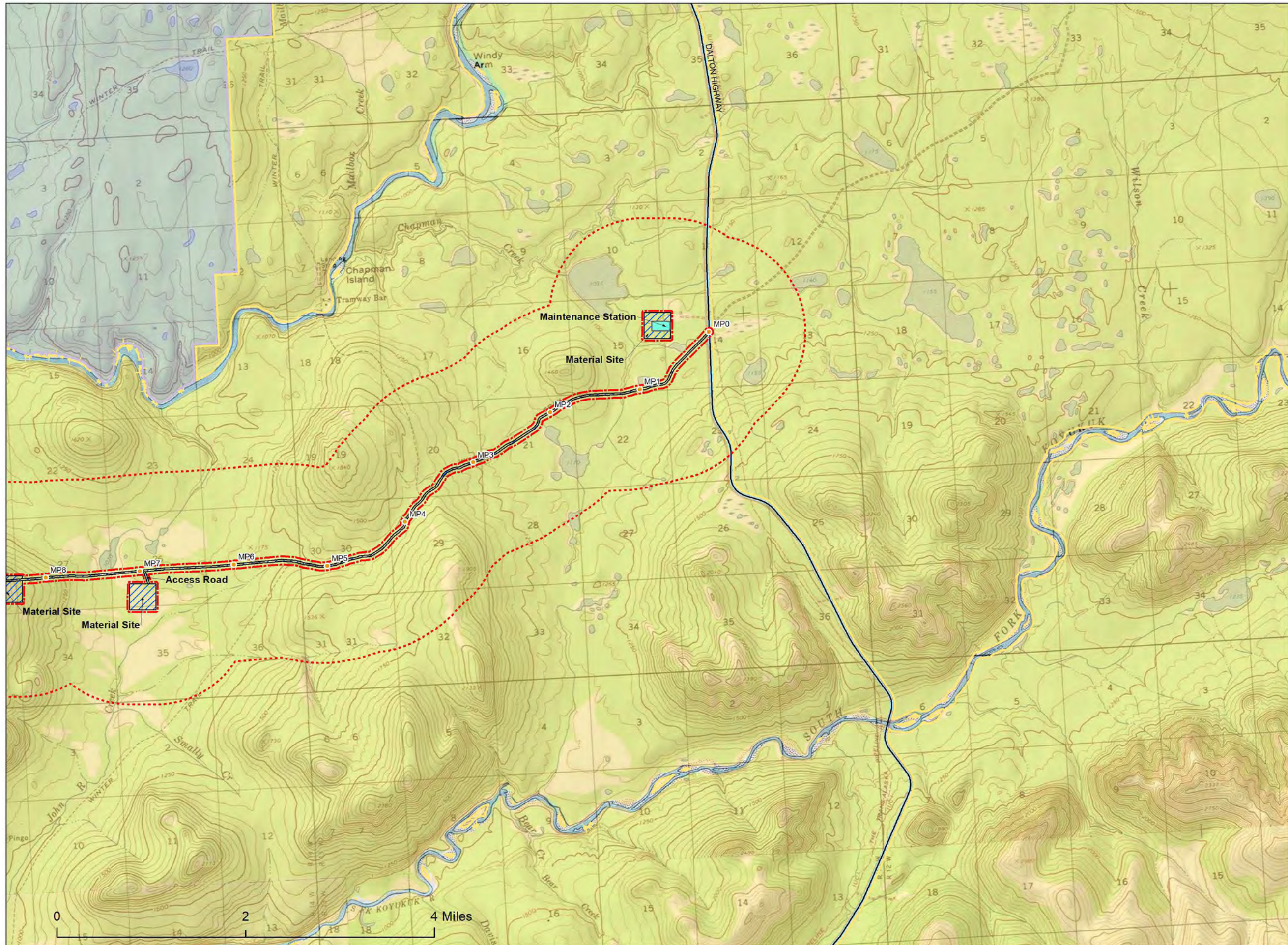
Survey – The term “survey” is used throughout this document to refer to inventory efforts that are field-based only. The term is similar to inventory, but “inventory” is used throughout this document to refer to all efforts to compile information on historic properties, including consultation, archival research, and fieldwork.

Survey Strategy – Required field inventory efforts based on a reasonable and good faith effort and incorporating specific field methods to document and record sites. The Survey Strategy will be developed by integrating multiple data sources for historic, ethnographic, and archaeological resources for the entire APE which will then be used to classify the APE into areas of high, medium, or low potential to contain archaeological and cultural material.

TCP (Traditional Cultural Property) – A place that is eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. TCPs are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of the community. More information on TCPs is found in the National Park Service Bulletin 38 *Guidelines for Evaluating and Documenting Traditional Cultural Properties*.

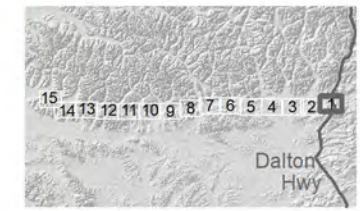
Undertaking – A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license, or approval as defined at 36 CFR 800.16(y).

Attachment A – Maps



- Alternative A Footprints
- Direct APE
- Indirect APE
- Major Roadways
- Administered Lands***
- Bureau of Land Management
- National Park Service
- State

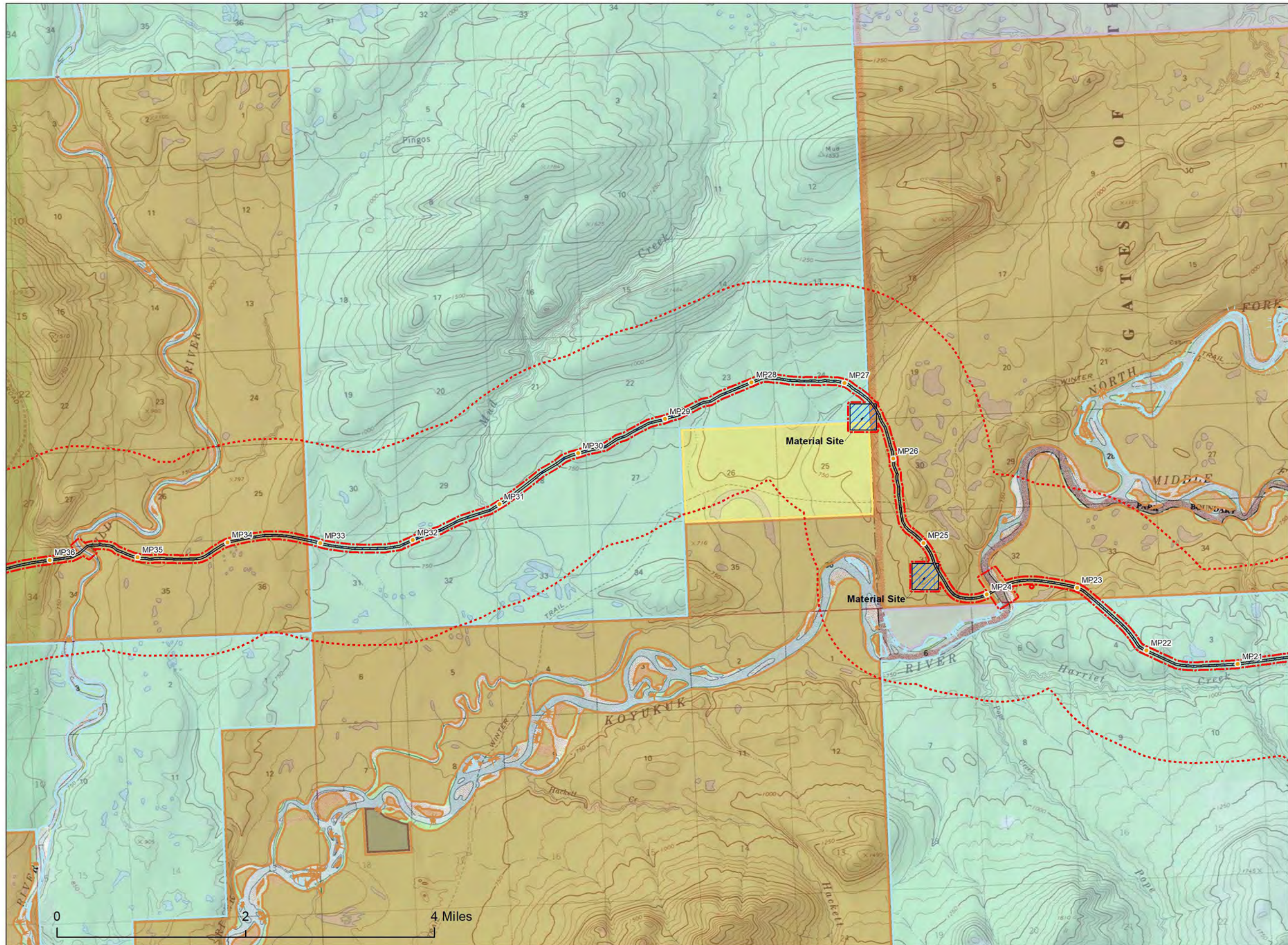
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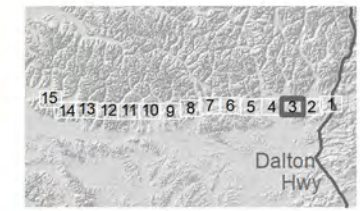
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 Date of APE: January, 2020
 Date of Project Components: April, 2019
 Alaska Albers
 1983 North America Datum
 For more information visit
www.blm.gov/AmblerRoadEIS
 No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.





- Alternative A Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- Alaska Native Allotment
- Alaska Native Lands
- Patented or Interim Conveyed
- Bureau of Land Management
- National Park Service
- State

*Current as of April 11th, 2018

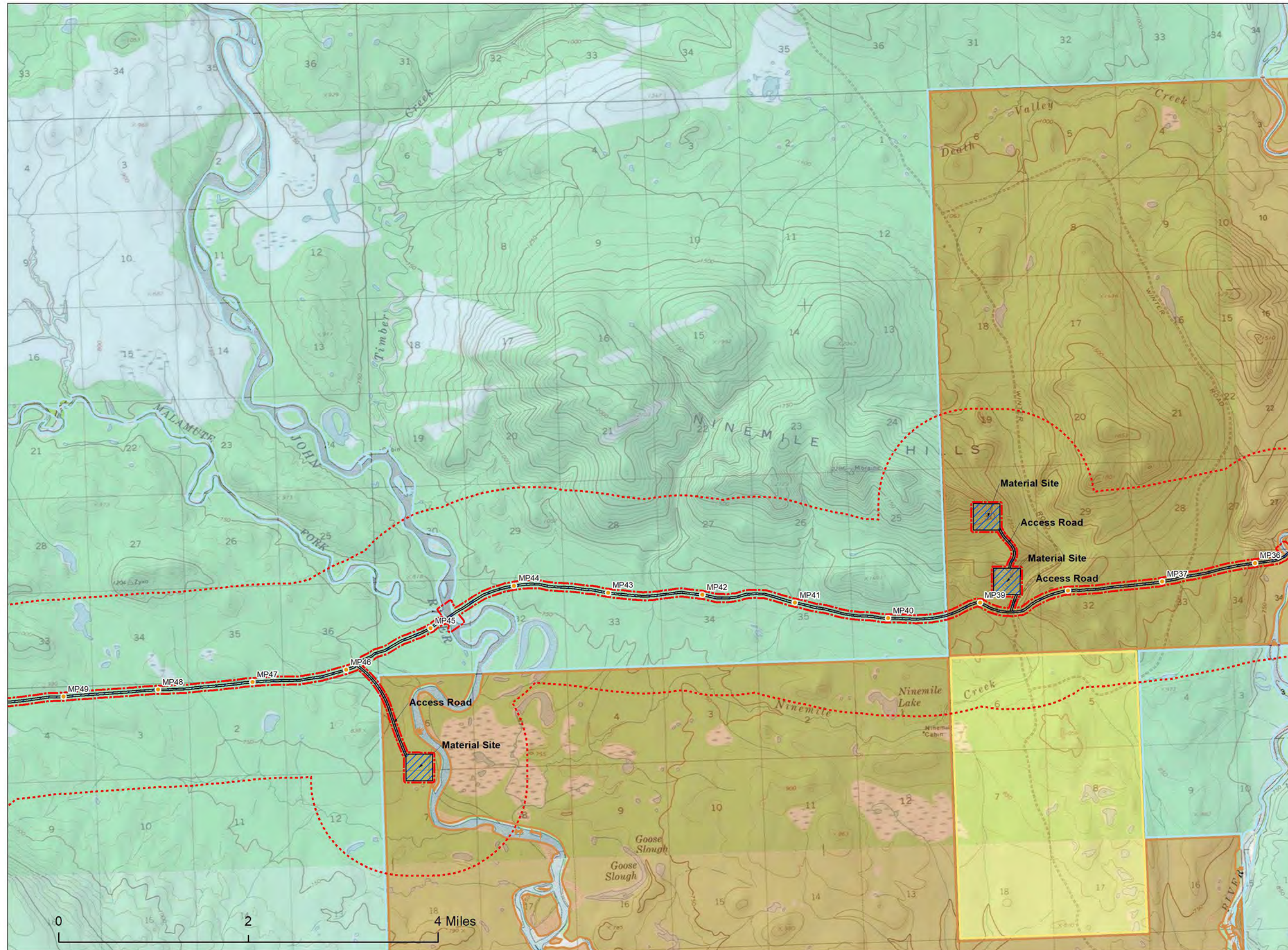


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0 2 4 Miles



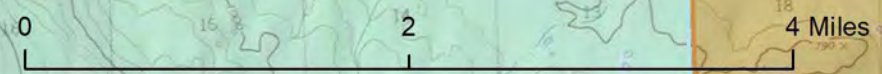
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- Direct APE
- Indirect APE
- Administered Lands***
 - Alaska Native Lands Patented or Interim Conveyed
 - Bureau of Land Management
 - State

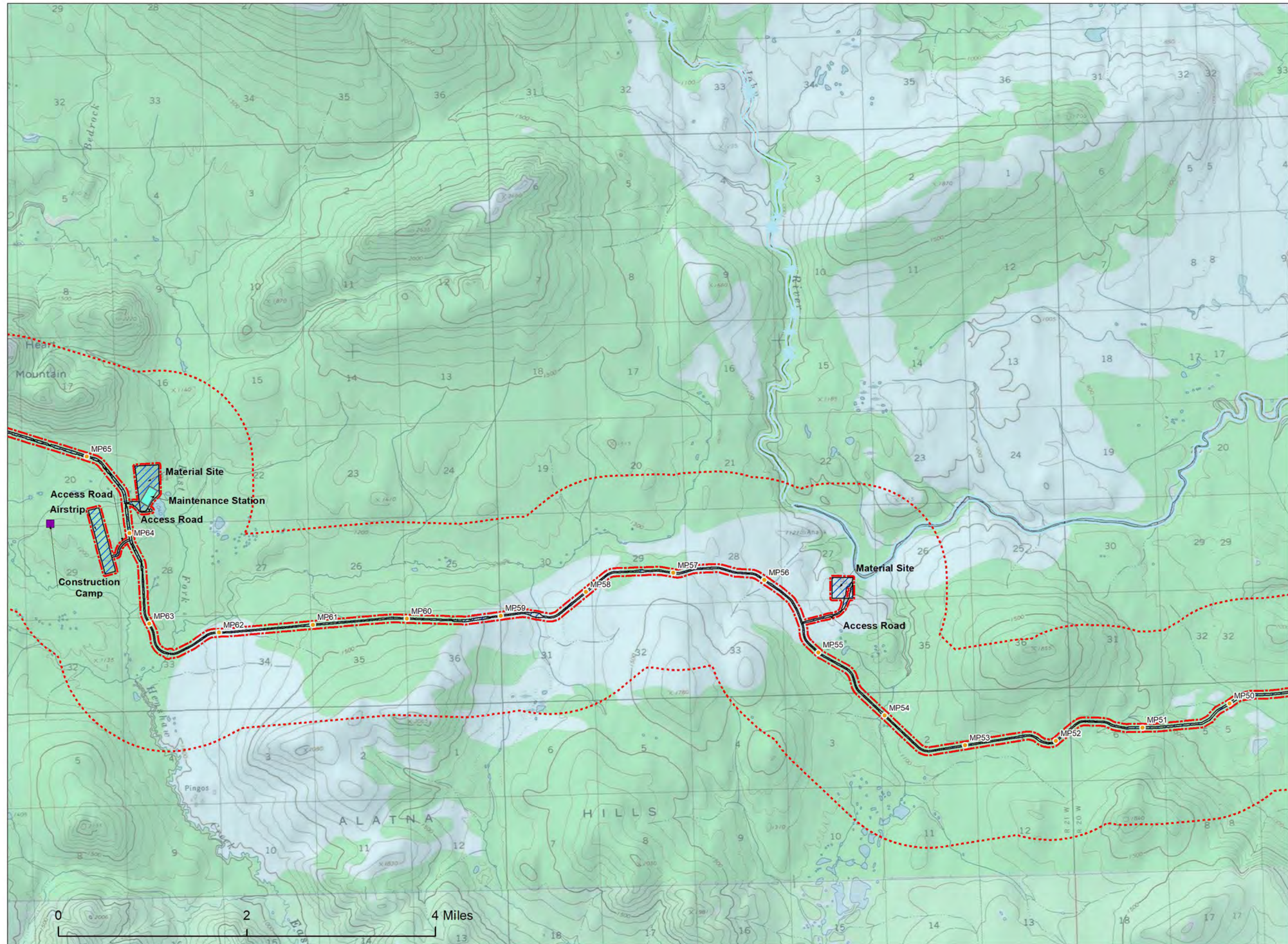
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- Alternative A Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- State

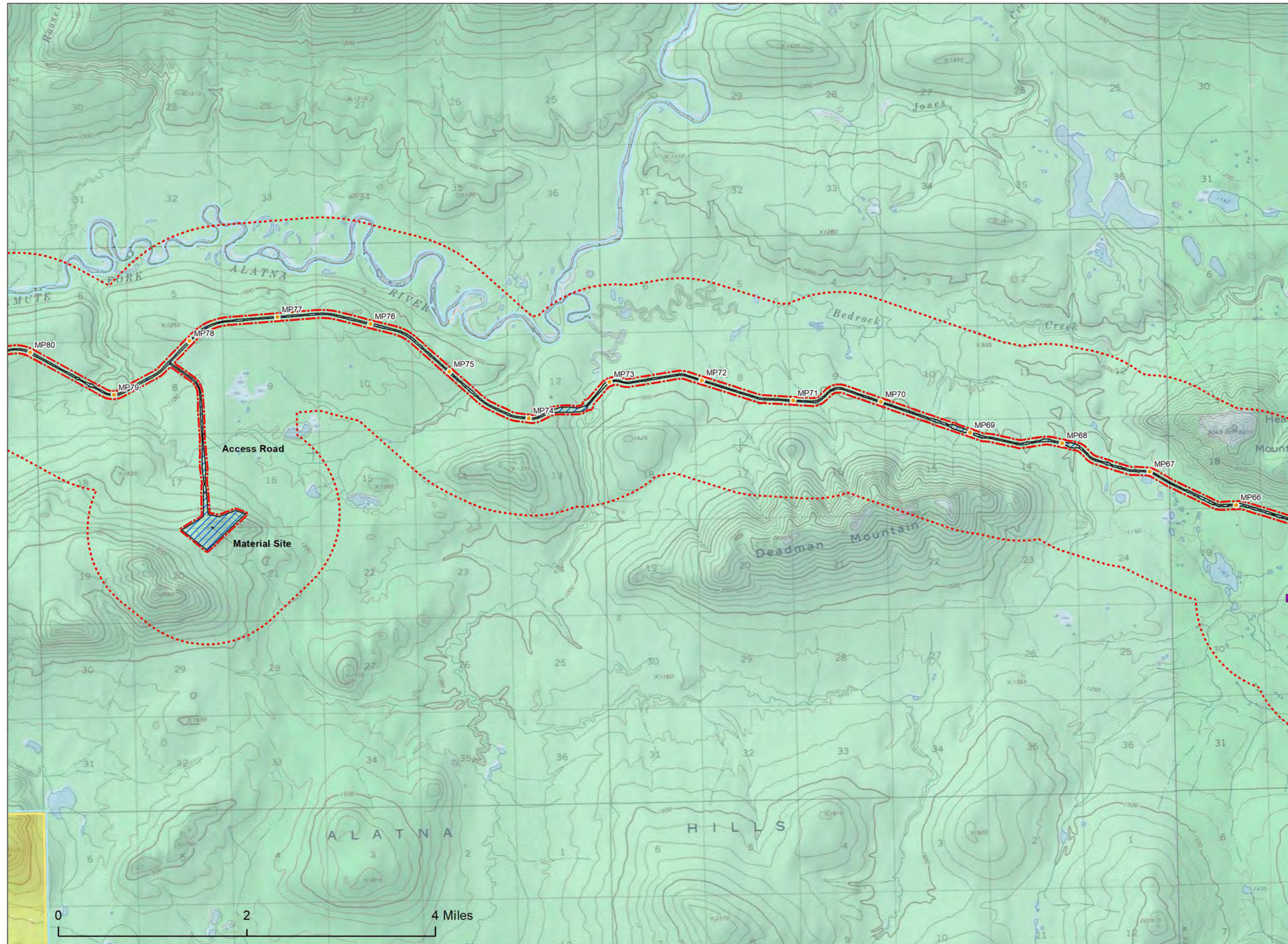
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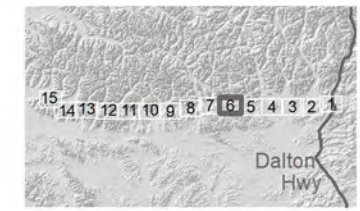
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- Direct APE
- Indirect APE
- Administered Lands***
- Bureau of Land Management
- State

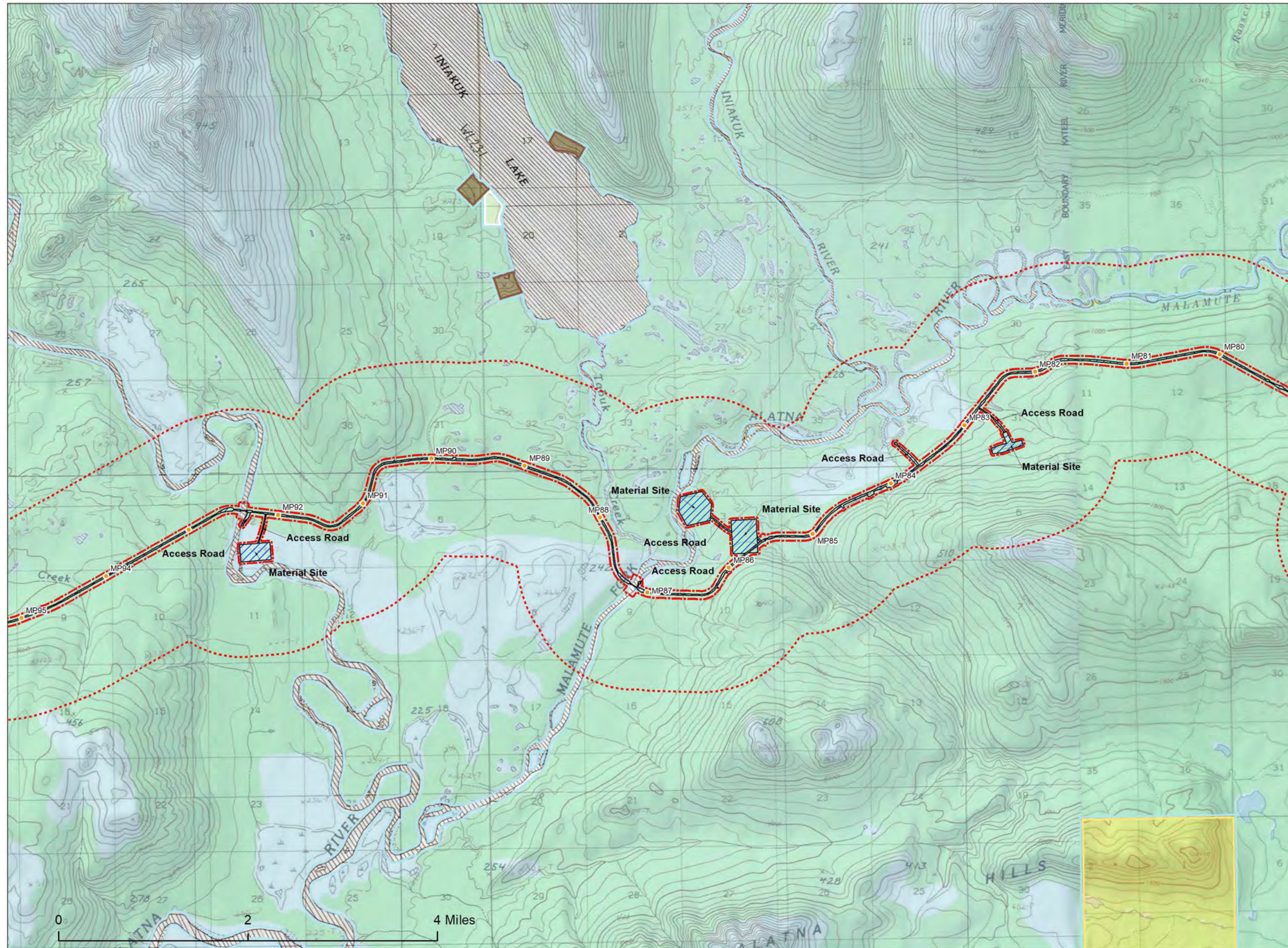
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- Alternative A Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- Alaska Native Allotment
- Bureau of Land Management
- Private
- State

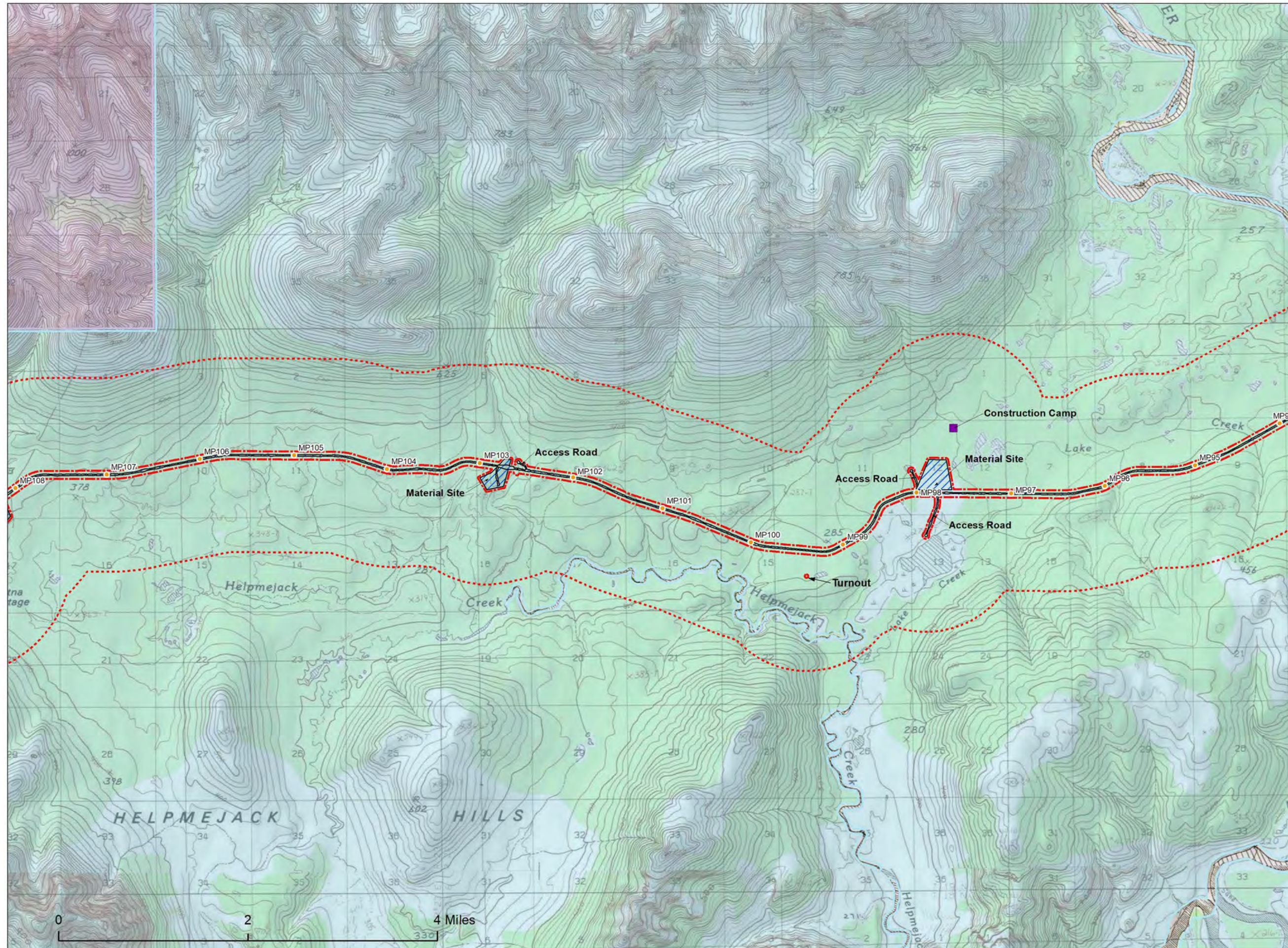
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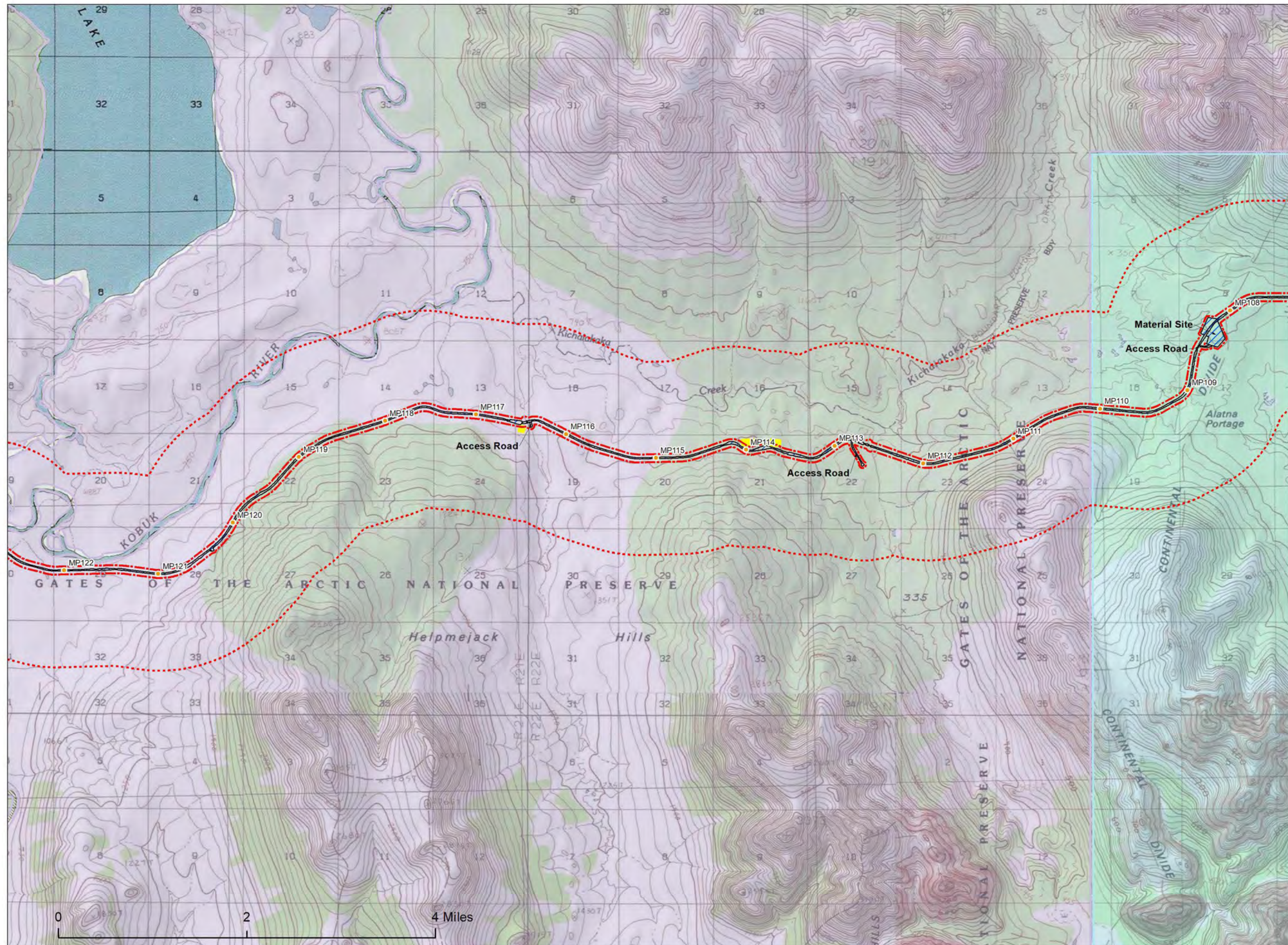
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- Alternative A Footprints
- Direct APE
- Indirect APE
- 2014 Ambler Pedestrian Survey
- Administered Lands***
- National Park Service
- State

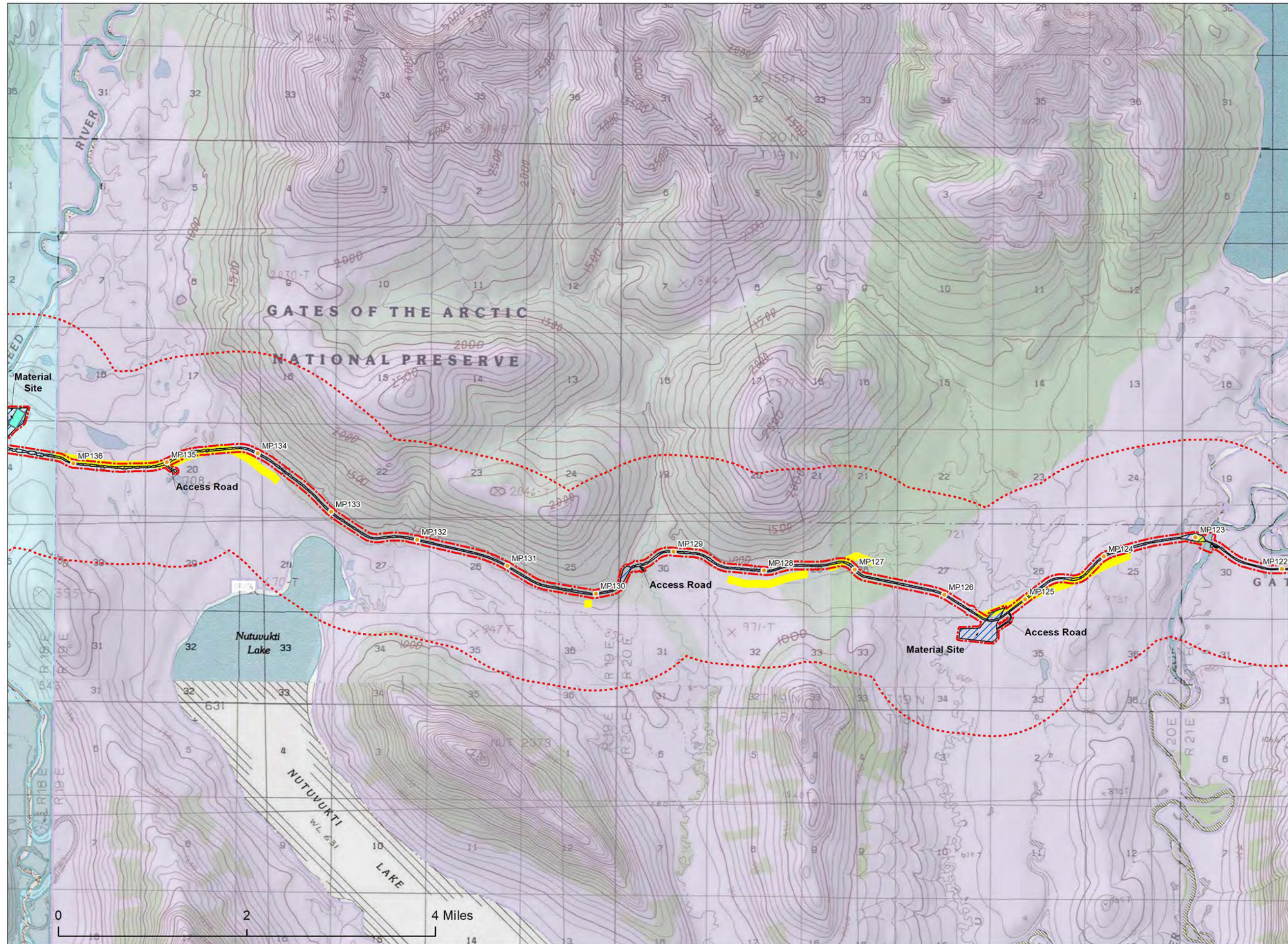
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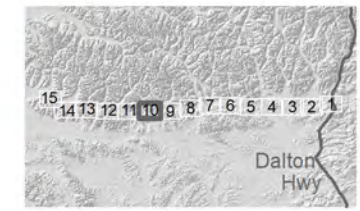
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- Alternative A Footprints
- Direct APE
- Indirect APE
- 2014 Ambler Pedestrian Survey
- Administered Lands***
- Local Government
- National Park Service
- Private
- State

*Current as of April 11th, 2018

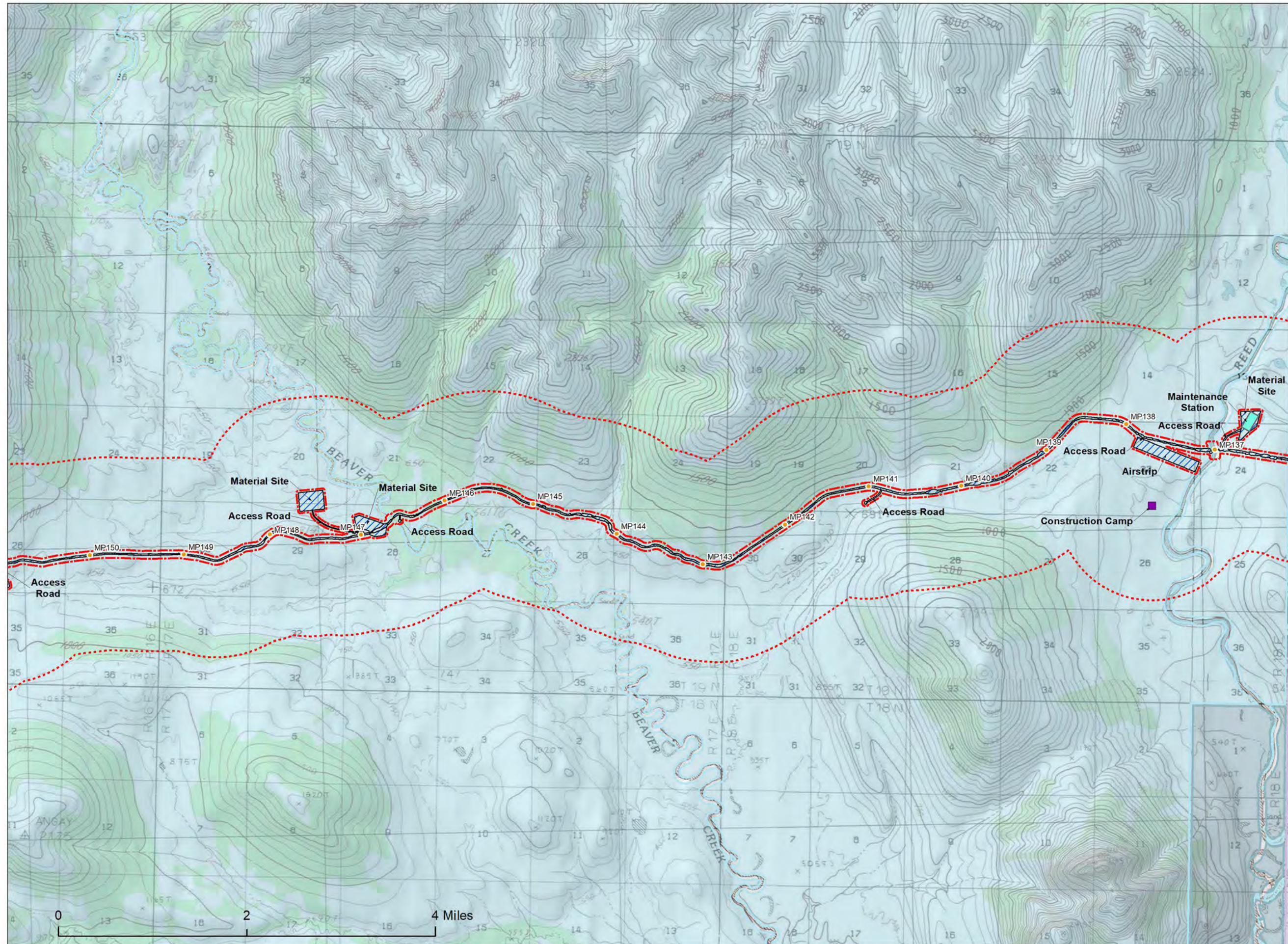


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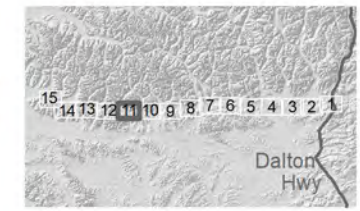


0 2 4 Miles



- Alternative A Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- Local Government
- National Park Service
- State

*Current as of April 11th, 2018



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NOTES:
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 Basemap scale: 1:63,360
 Map Date: 3/17/2020
 Date of APE: January, 2020
 Date of Project Components: April, 2019
 Alaska Albers
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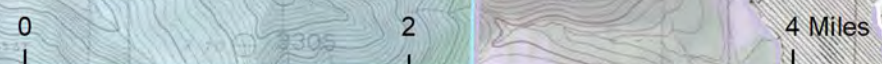
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- Direct APE
- Indirect APE
- Administered Lands***
- Alaska Native Allotment
- Local Government
- National Park Service
- Private
- State

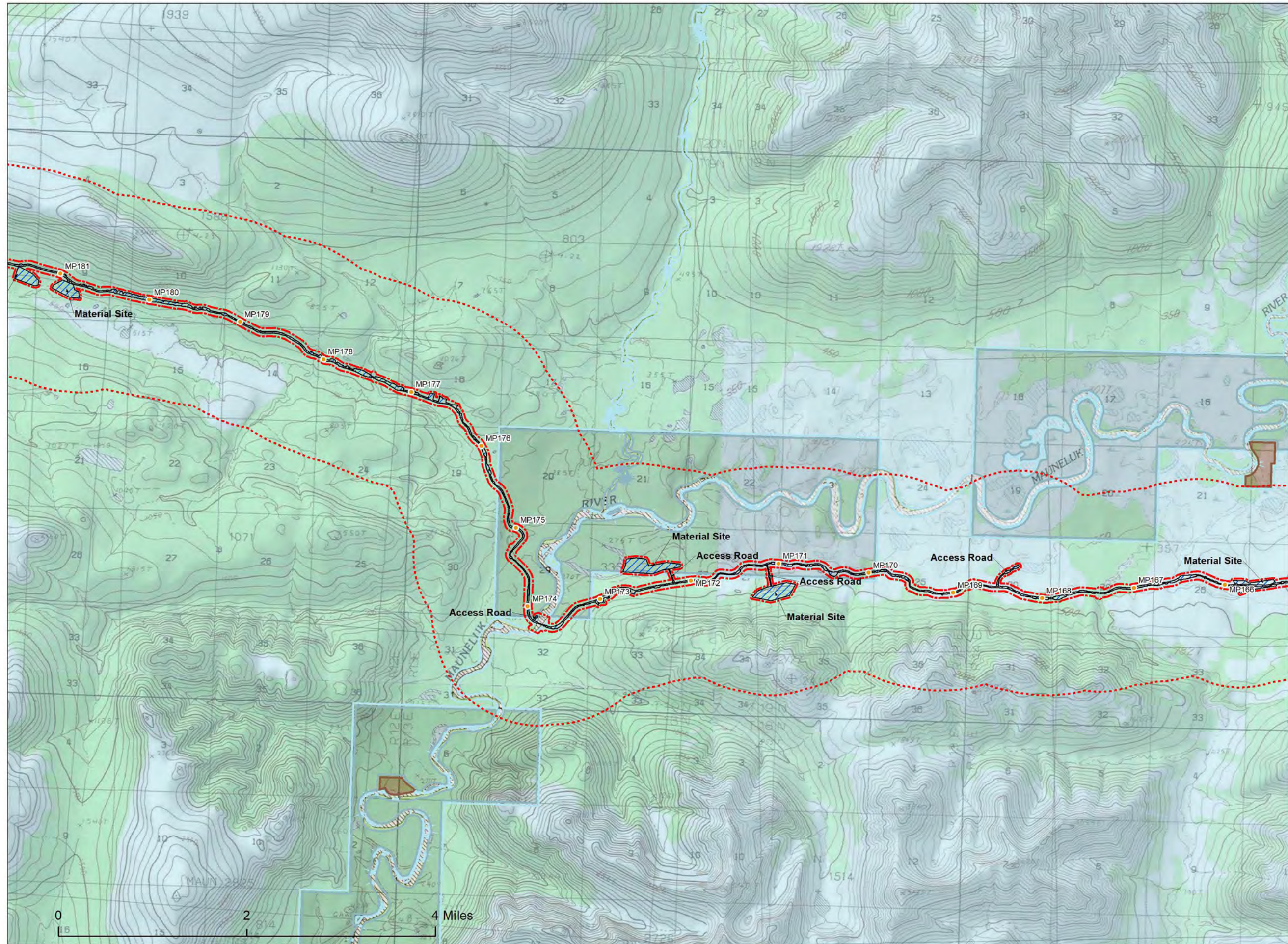
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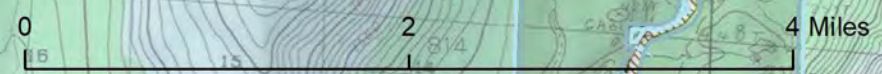
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- Local Government
- State

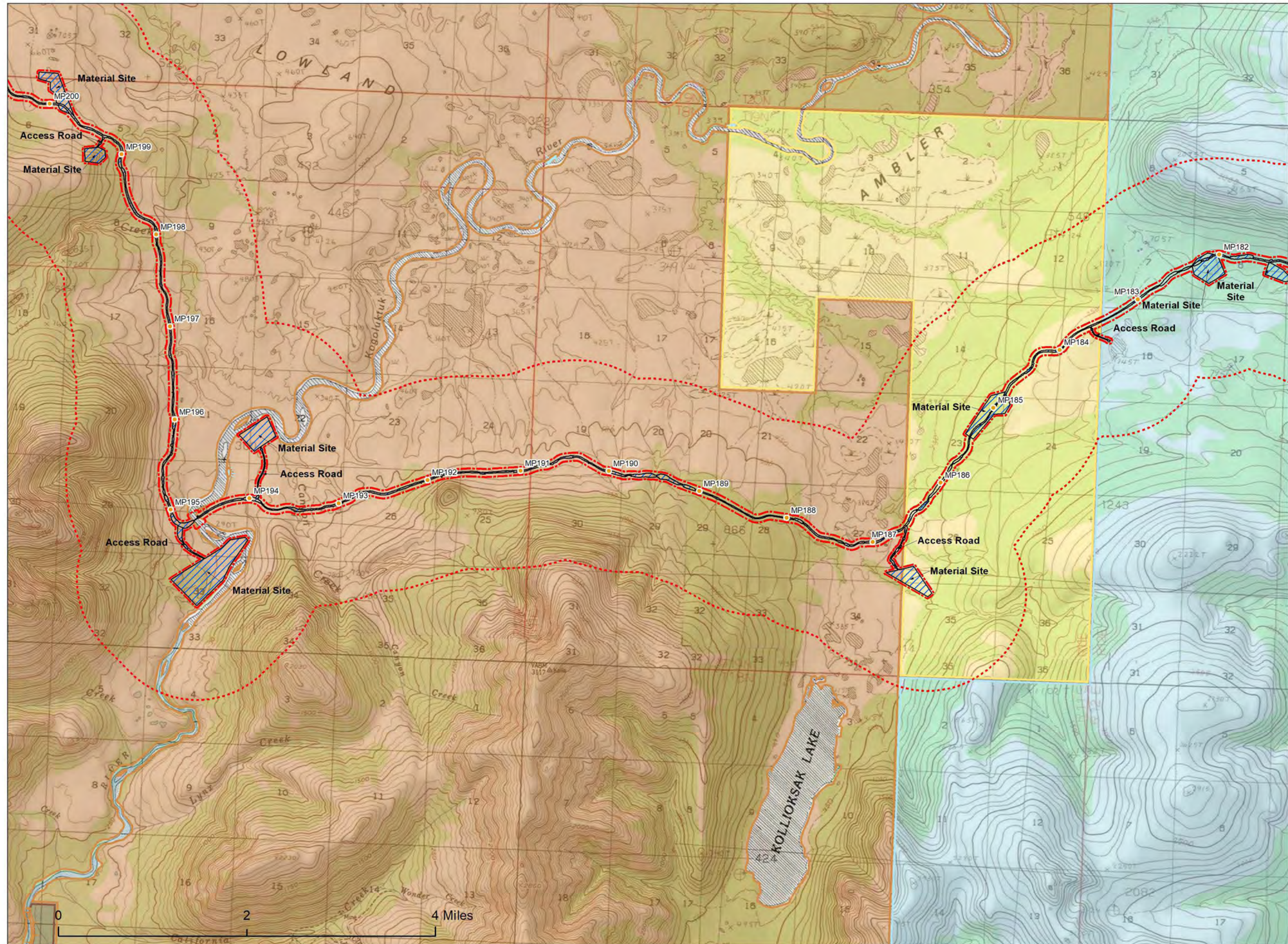
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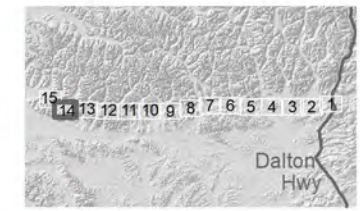
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- Alternative A Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- Alaska Native Allotment
- Alaska Native Lands
- Patented or Interim Conveyed
- Bureau of Land Management
- State

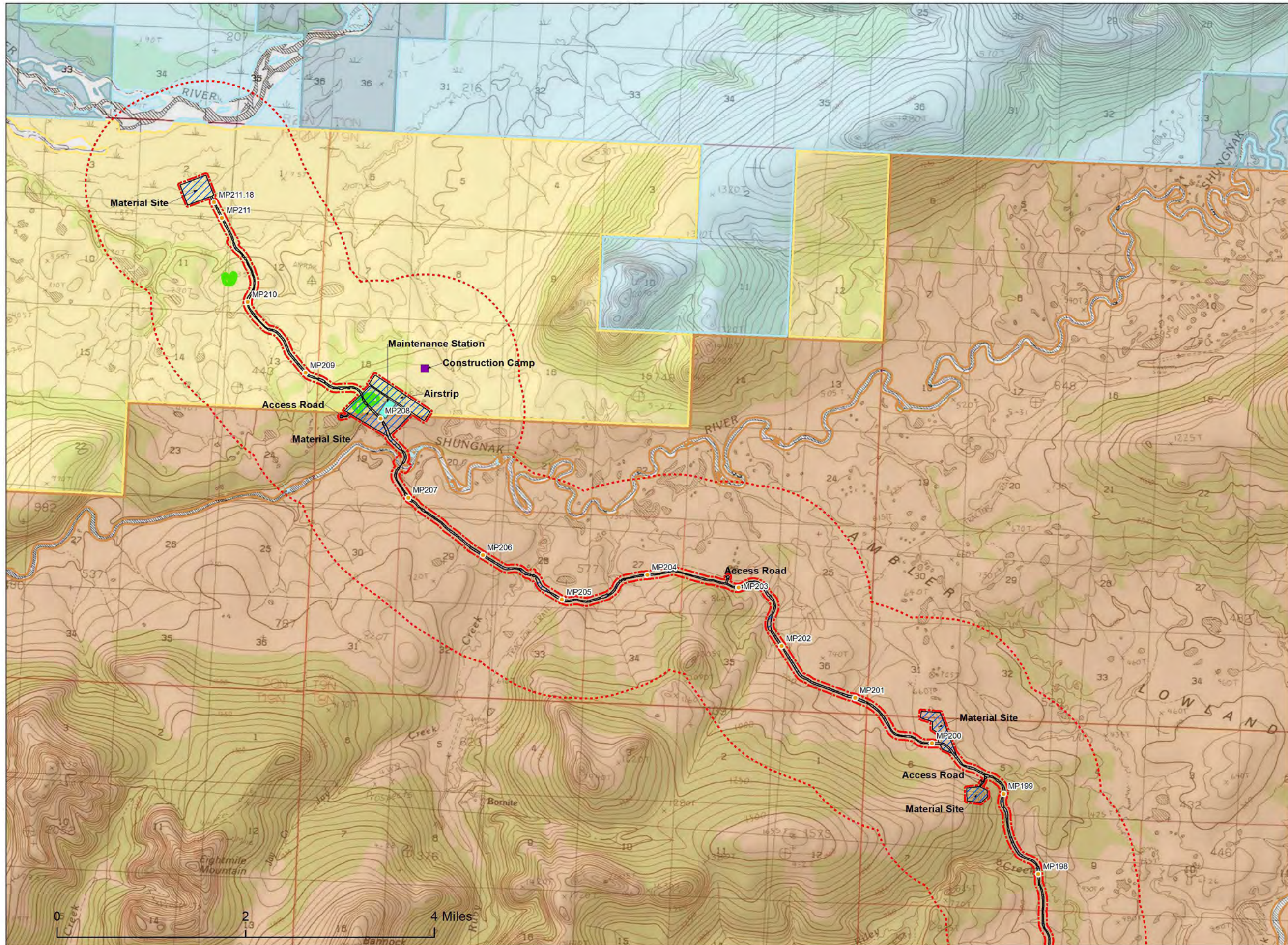
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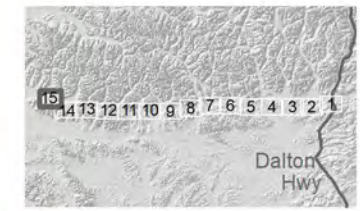
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- Alternative A Footprints
 - Direct APE
 - Indirect APE
 - 2013 Ambler Pedestrian Survey
- Administered Lands***
- Alaska Native Lands
 - Patented or Interim Conveyed
 - Bureau of Land Management
 - Local Government
 - State

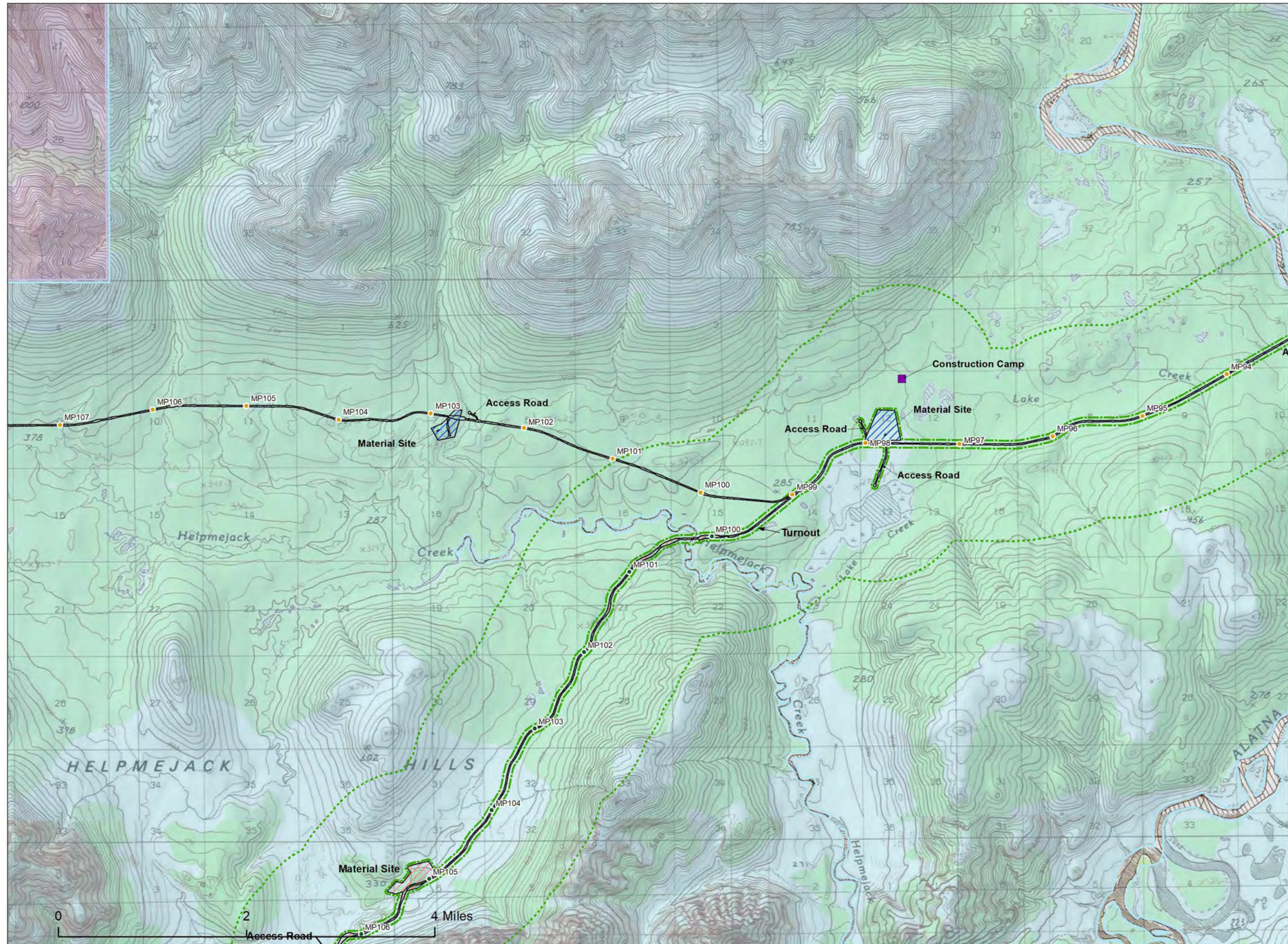
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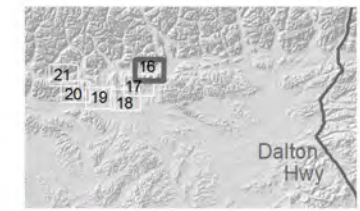
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- Alternative A Footprints
- Alternative B Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- National Park Service
- State

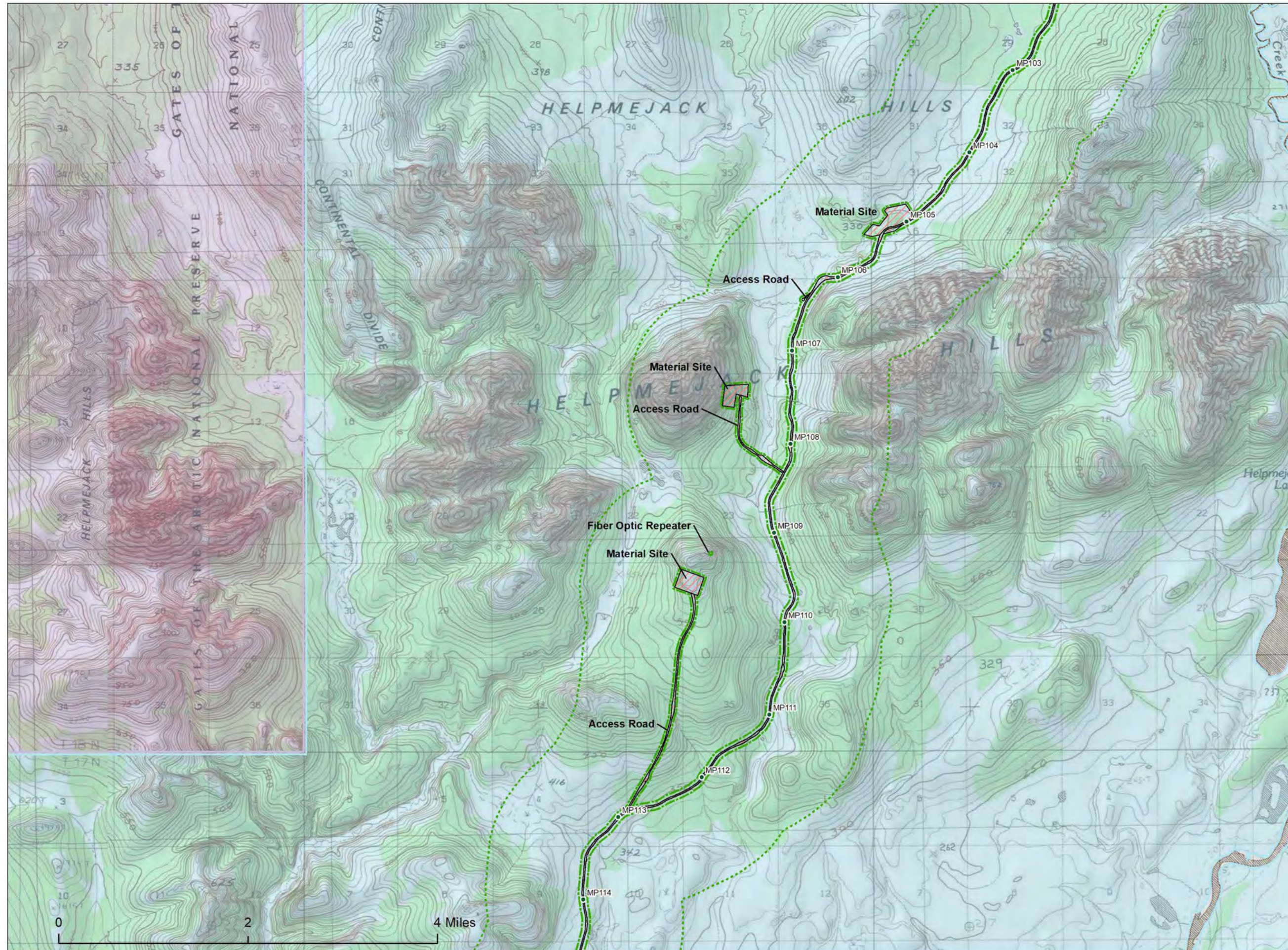
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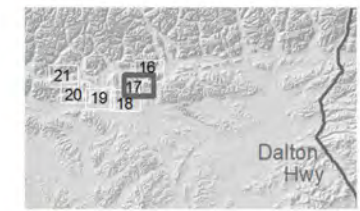
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- Alternative B Footprints
- Direct APE
- Indirect APE
- Administered Lands***
- National Park Service
- State

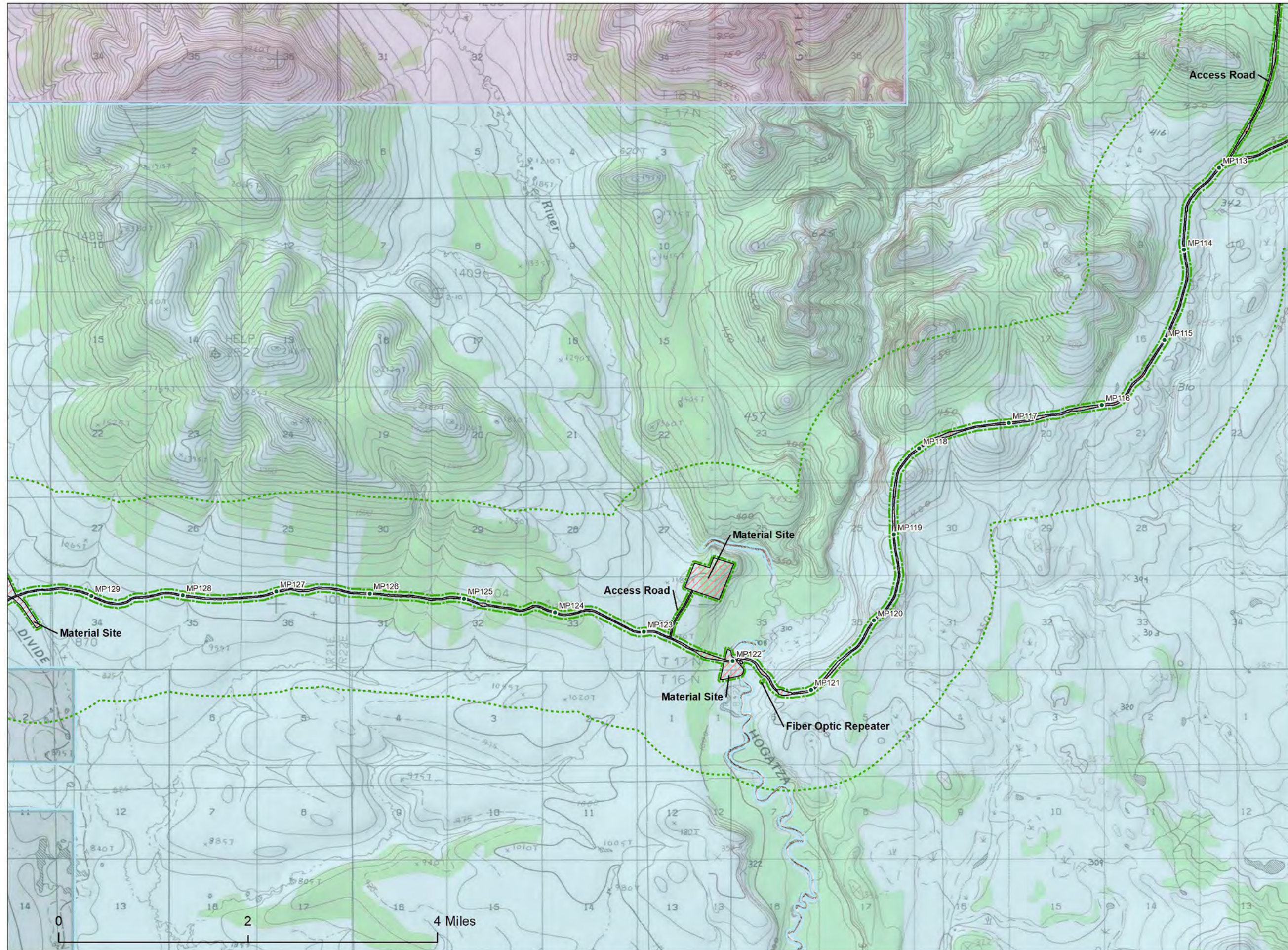
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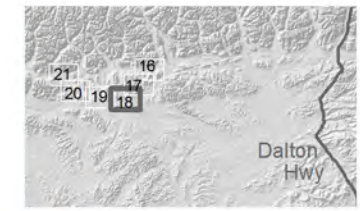
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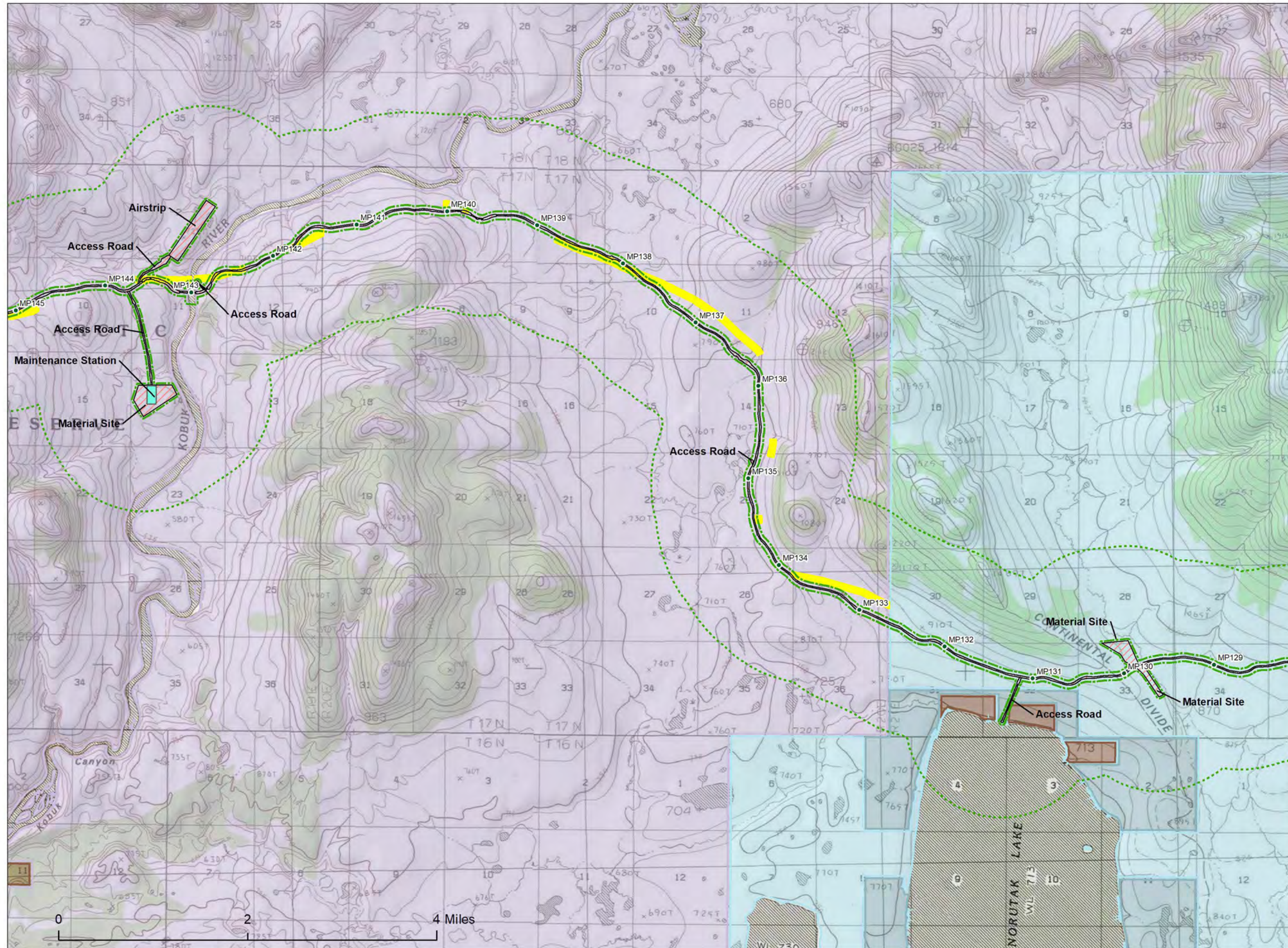
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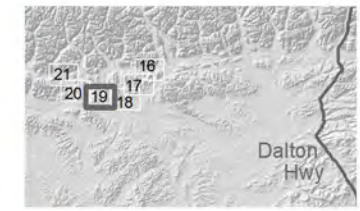
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- Administered Lands***
- Alaska Native Allotment
- Local Government
- National Park Service
- State

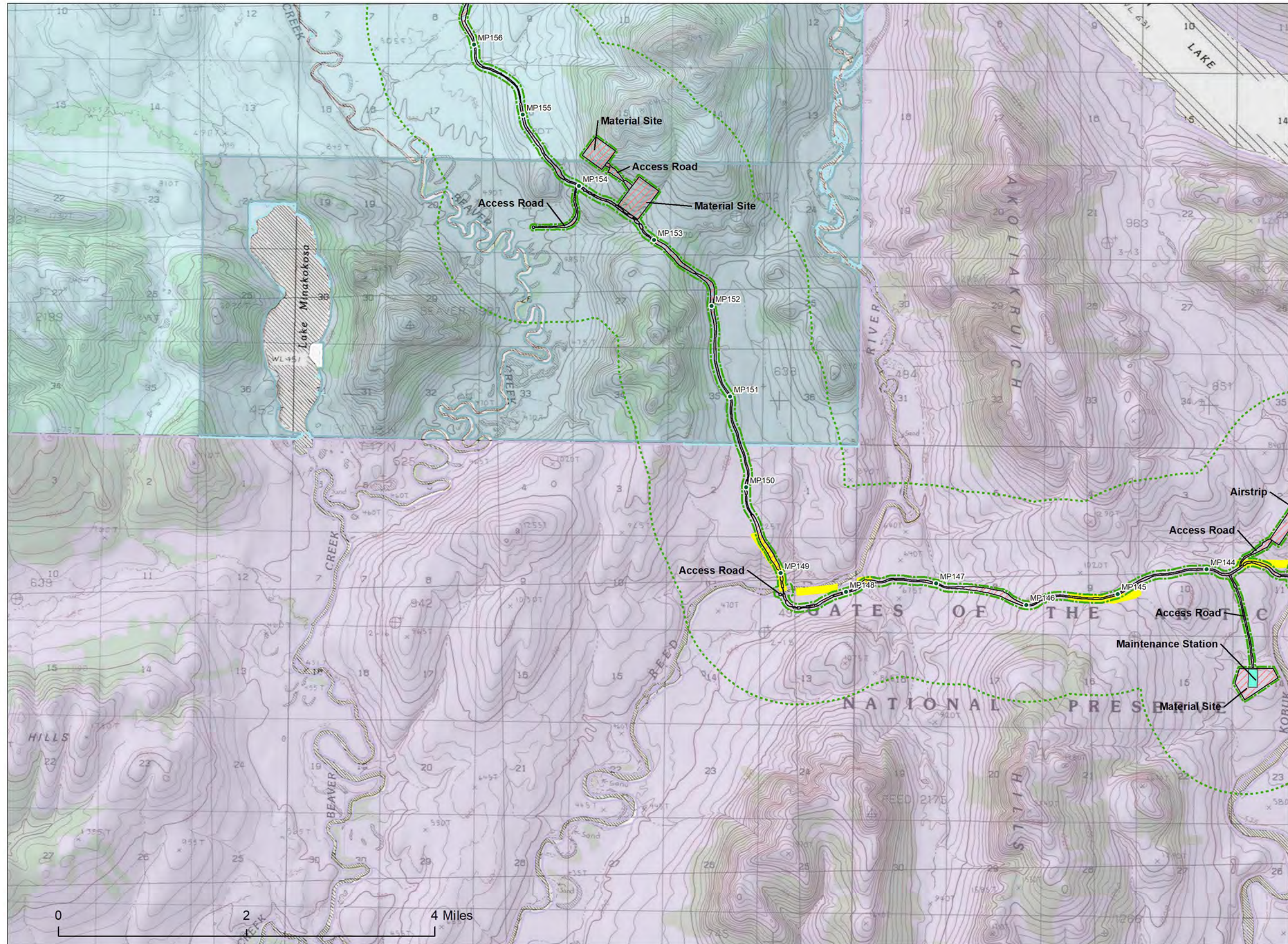
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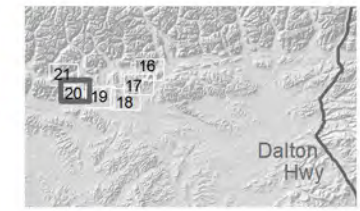
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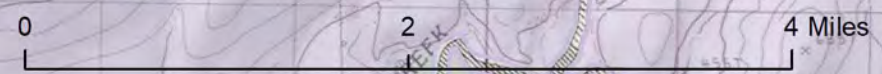
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- Indirect APE
- 2014 Ambler Pedestrian Survey
- Administered Lands***
- Local Government
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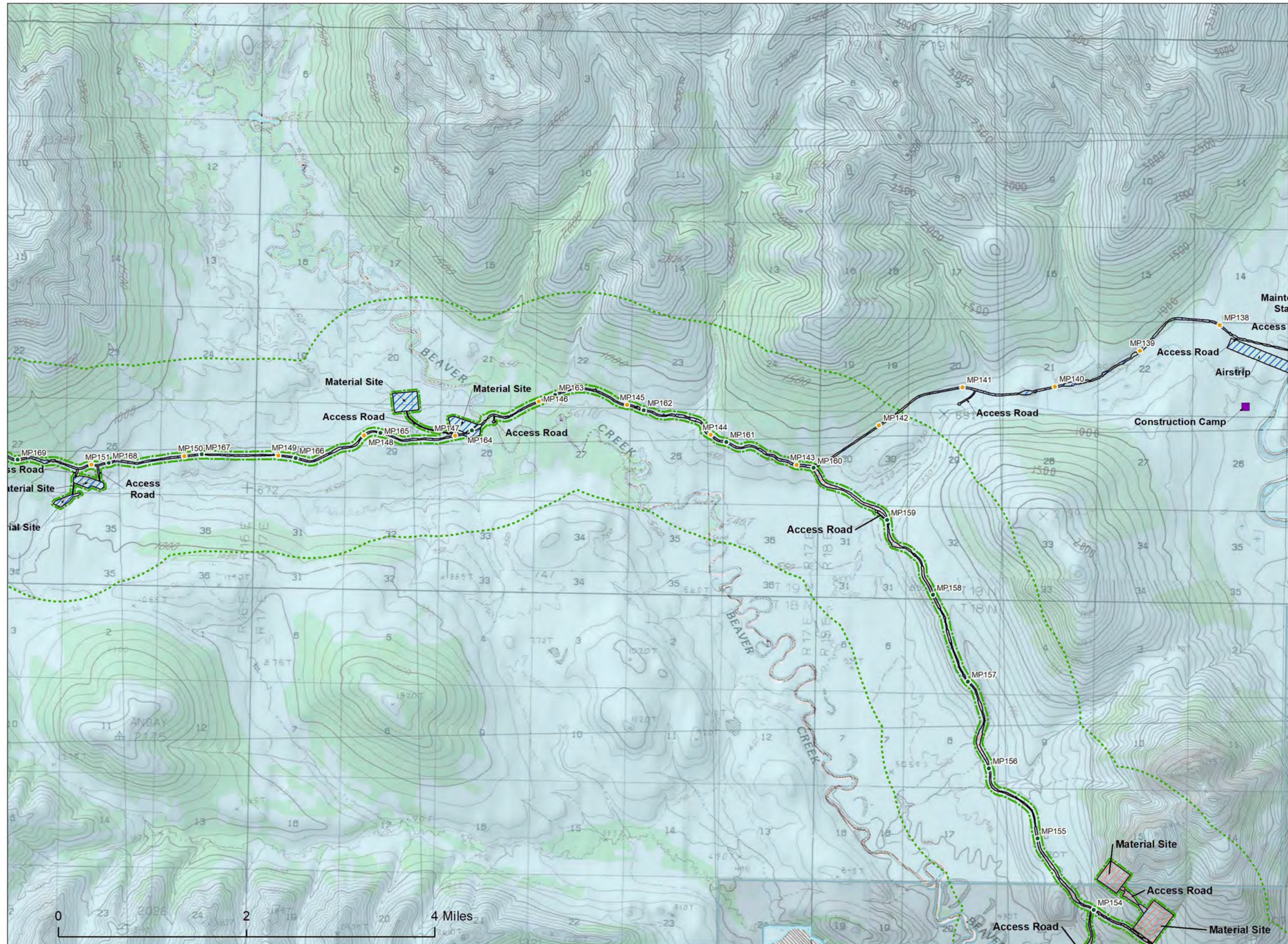
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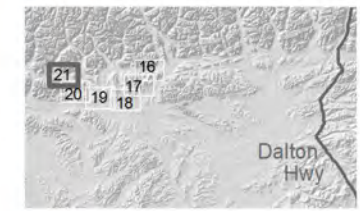
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Attachment B – Area of Potential Effects

Project APE (December 2019)

The Area of Potential Effects (APE)¹³ consists of a 1-mile buffer on each side of the proposed corridor and around all Project Components; see Attachment A, Maps. The corridor consists of a 250-foot wide, and, in some cases (such as water crossings or steep terrain), 400-foot wide footprint. Components include vehicle turnouts, work camps, storage and staging areas, material sources, airstrips, access roads, maintenance stations, and/or any other Project features. The Bureau of Land Management (BLM), in consultation with the Consulting Parties, determined the 1-mile APE will encompass reasonably foreseeable direct, indirect, or cumulative adverse effects¹⁴ from the Project. While some effects may be present beyond the APE in certain areas (e.g., the road may be visible for more than 1 mile away when viewed from higher ground), it is unlikely that the eligibility or significance of any historic properties would be changed, and therefore the effect would not be considered adverse. Inventory methods within the APE will vary based on the following:

Inventory for Direct Effects¹⁵ (Direct APE):

Inventory for direct effects will include the 250-foot wide, and, in some cases (such as water crossings or steep terrain), 400-foot wide corridor, plus a 100-foot buffer on each side of the corridor. Inventory for direct effects will also encompass the footprint of all Project Components (e.g., vehicle turnouts, work camps, storage and staging areas, material sources, airstrips, access roads, and maintenance stations or any other features), plus a 100-foot buffer around the footprint.

Inventory for Indirect and Cumulative Effects¹⁶ (Indirect APE):

Inventory for indirect and cumulative effects will be considered for the portion of the APE that falls outside of the Direct APE.

The BLM, in consultation with the Consulting Parties, will consider whether any changes to the APE is needed during the Annual Meeting (XV.A). Revisions to the APE could be necessary based on updated project plans; additional information about construction, maintenance, or reclamation procedures; newly identified resources or new information about historic or traditional uses of an area; new survey methods or technology; environmental factors; information from monitoring; or other factors.

¹³ Per 36 CFR 800.16(d), an APE is “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historical properties, if any such properties exist.”

¹⁴ Per 36 CFR 800.5(a)(1), an adverse effect is found when an Undertaking may alter, directly or indirectly, the characteristics of a historic property that qualify it for inclusion in the NRHP. Adverse effects may include reasonably foreseeable effects caused by the Undertaking that may occur later in time, be farther removed in distance, or be cumulative.

¹⁵ Per 36 CFR 800.5(a)(2), direct effects include physical destruction/damage, alteration not consistent with 36 CFR 68, removal of a property from a historic location, change in the character of use or physical features, deterioration through neglect, or introduction of visual, atmospheric, or audible elements that diminish the integrity. This includes effects that come from an Undertaking at the same time and place with no intervening cause, regardless of the specific type (i.e., visual, physical, auditory).

¹⁶ Indirect effects are those caused by the Undertaking that are later in time or farther removed in distance but are still reasonably foreseeable. Cumulative effects result from incremental actions that, when added to other past, present, and reasonably foreseeable future actions, may adversely affect a historic property.

Attachment C – Previously Recorded AHRS Resources¹⁷

AHRS Number	Name	Period	Description	APE	Direct APE	NRHP Status	Landowner(s)
AMR-00227	Ticket Ridge Site	Prehistoric	Lithic and milled wood scatter	A/B	Yes	Unevaluated	BLM
AMR-00228	-	Unknown	Caim	A/B	No	Unevaluated	NANA
HUG-00005	Norutak 1	Prehistoric	Ceramic and lithic scatter	B	No	Unevaluated	Allotment
HUG-00006	Norutak 7	Prehistoric	Lithic scatter	B	No	Unevaluated	Allotment
HUG-00007	Norutak 4	Prehistoric, Modern	Lithic and modern artifact scatter	B	No	Unevaluated	Allotment
HUG-00016	-	Prehistoric	Isolated lithic	B	No	Unevaluated	NPS
HUG-00024	-	Prehistoric	Lithic scatter	B	Yes	Unevaluated	NPS
HUG-00025	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00028 ^a	-	Prehistoric	Lithic scatter	B	Yes	Unevaluated	NPS
HUG-00029	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00030	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00032 ^b	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00033	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00034	-	Prehistoric	Isolated lithic	B	No	Unevaluated	NPS
HUG-00035	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00036	-	Prehistoric	Isolated lithic	B	No	Unevaluated	NPS
HUG-00037	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00041	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00103	-	Prehistoric	Lithic scatter	B	No	Unevaluated	NPS
HUG-00104	-	Prehistoric	Lithic scatter	B	Yes	Unevaluated	NPS
HUG-00132	Norutak 2	Prehistoric	Ceramic and lithic scatter	B	No	Unevaluated	Allotment
HUG-00133	Norutak 3	Prehistoric	Lithic scatter	B	No	Unevaluated	State
HUG-00134	Norutak 5	Prehistoric	Depression features and lithics	B	No	Unevaluated	State
HUG-00136	Norutak 8	Prehistoric	Depressions features and lithics	B	No	Unevaluated	State
HUG-00192 ^b	-	Prehistoric	Subsurface lithic scatter	B	No	Unevaluated	NPS
HUG-00193	-	Prehistoric	Isolated lithic, projectile point	B	No	Unevaluated	NPS

¹⁷ Data from the AHRS database as of December 2019; APE based on Project alignments as of April 2019.

Ambler Mining District Industrial Access Road
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AHRS Number	Name	Period	Description	APE	Direct APE	NRHP Status	Landowner(s)
HUG-00195	-	Prehistoric	Isolated lithic	B	No	Unevaluated	NPS
WIS-00001	-	Prehistoric	Hearth and lithic scatter	A/B	No	Unevaluated	BLM
WIS-00002	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	BLM
WIS-00003	-	Prehistoric	Hearth and lithic scatter	A/B	No	Unevaluated	BLM
WIS-00004	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	BLM
WIS-00005	-	Prehistoric	Surface and subsurface lithic scatter	A/B	No	Unevaluated	BLM
WIS-00019	-	Prehistoric	Surface and subsurface lithic scatter	A/B	No	Unevaluated	BLM
WIS-00021	-	Prehistoric	Lithic scatter	A/B	Yes	Unevaluated	BLM
WIS-00029	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	BLM
WIS-00030	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	BLM
WIS-00043	-	Prehistoric	Isolated lithic	A/B	No	Unevaluated	BLM
WIS-00231	Chapman Lake 1	Prehistoric	Cache Pit	A/B	No	Unevaluated	BLM
WIS-00232	Chapman Lake 2	Prehistoric	Subsurface Lithic Scatter	A/B	No	Unevaluated	BLM
WIS-00345	Chapman Lake Can and Flake Site	Prehistoric and Historic	Historic and Prehistoric Artifact Scatter	A/B	No	Unevaluated	BLM
WIS-00252	Chapman #1	Prehistoric	Activity area, lithic scatter	A/B	No	Unevaluated	BLM
WIS-00408	Dalton Highway	Historic	Highway	A/B	Yes	Eligible	State
WIS-00409	Hickel Highway	Historic	Transportation, winter road	A/B	Yes	Unevaluated	Doyon, Ltd.
WIS-00414 ^a	-	Prehistoric	Lithic scatter	A/B	Yes	Unevaluated	BLM
XSP-00056	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00057	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00058	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00059	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00060	-	Prehistoric	Isolated lithic	A	No	Unevaluated	NPS
XSP-00061	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	NPS
XSP-00062	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00065	-	Prehistoric	Isolated lithic	A	No	Unevaluated	NPS
XSP-00067	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	State
XSP-00068	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS

Ambler Mining District Industrial Access Road
Section 106 Programmatic Agreement

AHRS Number	Name	Period	Description	APE	Direct APE	NRHP Status	Landowner(s)
XSP-00069	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00070	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00071	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00072 ^a	-	Prehistoric	Isolated lithic	A	Yes	Unevaluated	NPS
XSP-00073	-	Prehistoric	Isolated lithic	A	No	Unevaluated	State
XSP-00074	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	State
XSP-00075	-	Prehistoric	Isolated lithic	A	No	Unevaluated	State
XSP-00076	-	Prehistoric	Isolated lithic	A	No	Unevaluated	NPS
XSP-00079	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	NPS
XSP-00080	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	NPS
XSP-00096	-	Prehistoric	Isolated lithic	A	No	Unevaluated	NPS
XSP-00097 ^b	-	Prehistoric	Isolated lithic	A	No	Unevaluated	NPS
XSP-00099 ^a	-	Prehistoric	Lithic scatter	A/B	Yes	Unevaluated	State
XSP-00111	-	Prehistoric	Lithic scatter	B	No	Unevaluated	State
XSP-00112 ^a	-	Prehistoric	Lithic scatter	A	Yes	Unevaluated	State
XSP-00113	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	State
XSP-00114	-	Prehistoric	Lithic scatter	A	No	Unevaluated	State
XSP-00115	-	Prehistoric	Lithic scatter	A	No	Unevaluated	State
XSP-00117 ^b	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00118	-	Prehistoric	Lithic scatter	A	No	Unevaluated	State
XSP-00119	-	Prehistoric	Lithic scatter	A	No	Unevaluated	State
XSP-00126	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	State
XSP-00127	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00128	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00129	-	Prehistoric	Lithic scatter	A	No	Unevaluated	State
XSP-00131	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	NPS
XSP-00135	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	NPS
XSP-00136	-	Prehistoric	Surface and subsurface lithic scatter	A	No	Unevaluated	State
XSP-00137 ^a	-	Prehistoric	Lithic scatter	A	Yes	Unevaluated	State

AHRS Number	Name	Period	Description	APE	Direct APE	NRHP Status	Landowner(s)
XSP-00138	-	Prehistoric	Lithic scatter	A	No	Unevaluated	State
XSP-00139 ^a	-	Prehistoric	Isolated lithic	A	Yes	Unevaluated	NPS
XSP-00140	-	Prehistoric	Lithic scatter	A	Yes	Unevaluated	NPS
XSP-00141 ^a	-	Prehistoric	Lithic scatter	A	Yes	Unevaluated	State
XSP-00142 ^a	-	Prehistoric	Lithic scatter	A	Yes	Unevaluated	NPS
XSP-00143	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00144	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00145	-	Prehistoric	Isolated lithic	A/B	Yes	Unevaluated	State
XSP-00147	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	State
XSP-00148	-	Prehistoric	Lithic Scatter	A/B	No	Unevaluated	State
XSP-00149	-	Prehistoric	Lithic Scatter	A/B	No	Unevaluated	State
XSP-00150	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	State
XSP-00151	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	State
XSP-00152	-	Prehistoric	Lithic scatter	A/B	No	Unevaluated	State
XSP-00153	-	Prehistoric	Isolated lithic	A/B	No	Unevaluated	State
XSP-00154	-	Prehistoric	Isolated lithic	A	No	Unevaluated	State
XSP-00407	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00436	-	Prehistoric	Lithic scatter	A	No	Unevaluated	NPS
XSP-00449 ^b	-	Historic	Trap	A	No	Unevaluated	NPS
XSP-00450	-	Historic	Can, cut wood	A	No	Unevaluated	NPS
XSP-00495	-	Prehistoric	Subsurface lithic scatter	A	No	Unevaluated	NPS
XSP-00496 ^a	-	Prehistoric	Isolated lithic	A	Yes	Unevaluated	NPS

^a Site geometry falls outside of the Direct APE but was buffered 500 feet to account for unknown data accuracy and lack of defined site boundaries. Buffered site geometry falls within the **Direct APE**.

^b Site geometry falls outside of the APE but was buffered 500 feet to account for unknown data accuracy and lack of defined site boundaries. Buffered site geometry falls within the **Indirect APE**.

Attachment D – List of Parties Invited to Consult on the Section 106 Process

Federally Recognized Tribes (52)

Alatna Village Council ^a
Allakaket Village Council ^a
Arctic Village Traditional Council
Beaver Traditional Council
Birch Creek Tribal Council
Brevig Mission Traditional Council
Buckland IRA Council
Chalkyitsik Traditional Council
Circle Traditional Council
Deering IRA Council
Denduu Gwich'in Tribal Council
Elim IRA Council
Evansville Village ^a
Fort Yukon IRA Council
Golovin-Chinik Eskimo Community
Hughes Village Council ^a
Huslia Village Council ^a
Inupiat Community of the Arctic Slope
Kaltag Traditional Council
Kiana Traditional Council
Kivalina Traditional Council
Koyukuk Traditional Council
Louden Tribal Council
Manley Traditional Council
Minto Traditional Council
Native Village of Ambler ^a
Native Village of Atkasuk
Native Village of Barrow
Native Village of Kotzebue
Native Village of Kobuk ^a
Native Village of Koyuk
Native Village of Mary's Igloo
Native Village of Noatak ^a
Native Village of Nuiqsut
Native Village of Point Hope
Native Village of Point Lay
Native Village of Selawik ^a
Native Village of Shaktoolik
Native Village of Shishmaref
Native Village of Shungnak ^a
Native Village of Stevens ^a
Native Village of Tanana ^a
Native Village of Venetie
Native Village of Wales
Native Village of White Mountain
Nenana Traditional Council
Nome Eskimo Community

Noorvik Native Community^a
Nulato Tribal Council
Rampart Tribal Council
Ruby Traditional Council
Village of Anaktuvuk Pass^a

ANSCA Corporations and Non-Profits (26)

Arctic Slope Regional Corporation
Baan O Yeel Kon Corporation
Bean Ridge Corporation
Beaver Kwit'Chin Corporation
Bering Straits Native Corporation
Chalkyitsik Native Corporation
Danzhit Hanlaih Corporation
Dineega Corporation
Dinyea Corporation^a
Doyon, Limited^a
Evansville, Incorporated^a
Gana-A'Yoo, Limited^a
Gwitchyaa Zhee Corporation
Kawerak, Incorporated
Kikiktagruk Inupiat Corp
K'oyitl'ots'ina Limited^a
Koyuk Native Corp
Maniilaq Association
NANA Regional Corporation^a
Nunamiut Corporation
Seth-De-Ya-Ah Corporation
Tanana Chiefs Conference^a
T'ee teraan'in - Council of Athabascan Tribal Governments
Tihteet' aii, Incorporated
Toghotthele Corporation
Tozitna, Limited

State and Federal Agencies (9)

Advisory Council on Historic Preservation (ACHP)^a
Alaska Department of Natural Resources (DNR)^a
Alaska Department of Transportation & Public Facilities (DOT&PF)^a
Alaska State Historic Preservation Officer (SHPO)^a
Bureau of Indian Affairs (BIA)^a
Environmental Protection Agency (EPA)
Federal Highway Administration (FHWA)
National Park Service (NPS)^a
U.S. Army Corps of Engineers (USACE)^a
U.S. Coast Guard (USCG)

City & Borough Governments (15)

City of Allakaket^a
City of Ambler^a
City of Anaktuvuk Pass^a
City of Bettles

City of Buckland
City of Deering
City of Kiana
City of Kobuk
City of Kotzebue^a
City of Noorvik
City of Selawik
City of Shungnak^a
Northwest Arctic Borough^a
North Slope Borough
Wiseman Community Association

Other Entities (6)

Alaska Federation of Natives
Alaska Historical Society
Alaska Industrial Development and Export Authority (AIDEA)^a
Brooks Range Council
First Alaskans Institute
Northern Alaska Environmental Center
Simon Paneak Museum

Note: ^a = Entities that have participated in or consulted with the BLM during the Section 106 Process.

Attachment E – Cultural Resource Management Plan

Abbreviated Table of Contents – see CRMP for full Table of Contents and text:

Table of Contents

- Chapter 1 – Introduction
- Chapter 2 – Previously Identified Cultural Resources
- Chapter 3 – Consultation
- Chapter 4 – Inventory
- Chapter 5 – Evaluation
- Chapter 6 – Historic Property Treatment and Mitigation
- Chapter 7 – Artifact Analysis and Curation
- Chapter 8 – Reporting Requirements
- Chapter 9 – Contractor Cultural Resource Awareness Training
- Chapter 10 – Monitoring Requirements

References

Definitions

Exhibits

- Exhibit A: Inadvertent Discovery of Cultural Resources Plan
- Exhibit B: Inadvertent Discovery of Human Remains Plan
- Exhibit C: Cultural Context Overview
- Exhibit D: Mapbook of AHRS Sites within the APE
- Exhibit E: Contact List
- Exhibit F: Signature Page for CRMP Finalization

Attachment F – Reporting Table

The Reporting Table represents the standard due dates and content for all required report, plan, and deliverables associated with implementation of the Programmatic Agreement (PA). In certain cases, the Submittal Due Date may vary for the first year of the Pre-Construction Phase.

Report Title	Submittal Due (XIV.B.i)	Content	Review Period (XIV.B.ii)	Review Focus	Required Report Approvals (XIV.B.iv)
Phase Plan (IV.E)	Prior to initiation of each Project Phase	Detailed descriptions of the locations of all Segments and Components, descriptions of the planned work Stages, and anticipated work schedules for all activities that will occur during that Phase.	N/A	Informational Only	None
Historic Themes(s) (VII.C.ii.a)	60 days prior to fieldwork initiation	Comprehensive summary of available data sources relating to traditional fishing economy; traditional hunting, trapping, and guiding economies; traditional trade networks; historic exploration and travel corridors; and prospecting and mining.	30 days	Review of themes to ensure they are adequate to reasonably identify high potential areas for survey within the APE.	BLM SHPO (15-day approval review period)
Annual Work Plan (VII.B.i)	No later than March 1 (annually)	Detailed information about the anticipated work for the upcoming year; where it will occur; how it will be phased within Project Segments, Stages, and/or Components; and how the Permittee will meet the PA requirements. Other submissions may include updates to the Phase Plan (IV.E), Historic Themes (VII.C.ii.a), Survey Strategy (VII.D), Monitoring Plan (X.D), and Contractor Training curriculum (XI.B).	30 days	Review of all content to ensure the work will meet the PA stipulations and reasonable and good faith intent for Section 106 compliance.	BLM SHPO NPS ^a (15-day approval review period)
Contractor Training Curriculum (XI)	With the Annual Work Plan (no later than March 1 annually)	Curriculum for training Project personnel on cultural resource information and procedures.	30 days	Review of curriculum – does it adequately capture necessary information.	BLM SHPO (15-day approval review period)
Annual PA Report (XV.B)	No later than March 1 (annually)	Summary of all activities resulting from PA implementation over the past year; content should be generalized to share with the public, with confidential information redacted as necessary.	30 days	Ensure all activities are documented and adequately described to share with the public.	BLM SHPO (15-day approval review period)

Report Title	Submittal Due (XIV.B.i)	Content	Review Period (XIV.B.ii)	Review Focus	Required Report Approvals (XIV.B.iv)
Interim Report for Indirect APE (VII.B.ii)	30 days following completion of fieldwork (annually)	Summary of inventory efforts and resources within the Indirect APE.	15 days	Identify resources within the Indirect APE that require NRHP evaluation.	No approval required, but BLM, SHPO, and NPS ^a will consult during a 7-day period.
Annual Fieldwork Report (VII.B.iii)	90 days following completion of fieldwork (annually)	1) Comprehensive summary of inventory efforts completed since the last report, including Monitoring results; 2) recommendations of NRHP eligibility for all cultural resources located within the Direct APE and those identified during review of the Interim Report for Indirect APE; 3) finding of effect recommendations for resources that may be eligible; and 4) recommended resolution measures for resources that may be adversely affected.	45 days	Review of all content to ensure the work will meet the PA stipulations and reasonable and good faith intent for Section 106 compliance.	BLM SHPO NPS ^a (15-day approval review period)
Treatment Plans (VII.B.iv)	120 days following approval of mitigation measures	Detailed property-specific description of the treatment measures to be implemented and schedule for the activities and deliverables.	30 days	Review to ensure treatment will be commensurate with the eligibility and significance of the historic property.	BLM SHPO NPS ^a (15-day approval review period)
Final Implementation Reports (VII.B.v)	180 days following implementation of Treatment Plan (or as determined necessary)	Summary of all activities that occurred at each historic property, from inventory through implementation of mitigation treatment measures, and description of all completed steps, analyses, methods, and results, including collections and datasets generated.	30 days	Review to ensure treatment is completed for the historic property.	BLM SHPO NPS ^a (15-day approval review period)
Technical Reports (VII.B.vi)	Variable	Results of background research, fieldwork activities, lab analyses, or other information as determined by the PA Signatories.	30 days	Review of methods, results, and/or other technical aspects or consider if mitigation for broad-scale effects may be necessary.	BLM SHPO (15-day approval review period)
Construction and Operations	Within 2 years following completion	Summary of PA implementation, including all work that occurred during that Phase or period,	30 days	Review to ensure compliance with the PA	BLM SHPO

Report Title	Submittal Due (XIV.B.i)	Content	Review Period (XIV.B.ii)	Review Focus	Required Report Approvals (XIV.B.iv)
Summary Report(s) (XV.C)	of Construction for Phase I, II, and III and/or every 10 years	resources found, measures implemented, changes and updates in project designs/plans, changes in management or roles, and/or other information as determined by the PA Signatories.		and that indirect and cumulative effects are accounted for.	(15-day approval review period)
Reclamation and Closure Report (XV.D)	TBD	TBD	TBD	TBD	TBD

^aRequires approval by the NPS for lands and/or historic properties under NPS jurisdiction.

Attachment G – Project Plans

DESCRIPTION OF PROPOSED PROJECT PHASES (December 2019)

Pre-Construction Phase

The first step is to complete design and permitting and acquire right of way (ROW) from non-federal sources. Activities required to complete permitting and design include geotechnical investigations at bridge locations, along the corridor centerline to refine the embankment design, and at material sites along the east-end realignment; aerial imagery and Light Detection and Ranging (LiDAR) (and/or survey) for areas lacking coverage; wetland delineation on areas not field delineated; hydrology studies; and cultural resource surveys.

At this stage, permits to be acquired would include final U.S. Army Corps of Engineers wetland permit and mitigation, U.S. Coast Guard bridge permits, Alaska Department of Natural Resources material site permits, Alaska Department of Fish and Game fish stream crossing permits, state and federal ROWs, etc. The timeframe for this Phase depends on project delivery method used, whether Design-Bid-Build¹⁸, Design-Build¹⁹, Construction Manager at Risk²⁰, Construction Manager/General Contractor²¹ and phasing.

If the project is broken up into “segments” (within each Phase), there could be design and permitting done on 1 segment and construction could start on that segment while design and permitting is done on other segments. Contractor input would be needed to identify appropriate segments and the sequencing of segments for permitting and construction.

Summary:

- Years: 1 to 2 – May overlap with Phase I Construction timing.
- Components: No installed Components associated with this Phase.
- Activities: May include aerial mapping/photography/LiDAR; survey (including some brush clearing); water monitoring; wetland delineation; cultural resource modeling and surveys; drilling in material sites, along alignment, and bridge locations.

Phase I Construction (Seasonal Pioneer Road)

¹⁸ **Design-Bid-Build** – This is the traditional delivery method for construction projects where the Owner contracts with a designer to design the project. Once design is complete, the project is put out to bid to Contractors to build as designed. Owner then enters into a construction contract with Contractor.

¹⁹ **Design-Build** – This is an alternative delivery method for construction projects where the Owner hires a designer-contractor team to design and build the project. The Owner enters into one contract with the team to do both design and construction.

²⁰ **Construction Manager at Risk** – This is an alternative delivery method for construction projects where the Owner contracts separately with the designer and construction manager (CM). The CM acts as a consultant during design and as a general contractor during construction. The CM’s responsibilities include procuring equipment and subcontracts and delivering the project within a fixed, negotiated price. In most states, the CM must be a licensed general contractor.

²¹ **Construction Manager/General Contractor** - This is an alternative delivery method for construction projects and is very similar to the Construction Manager at Risk method. During the design phase, the construction manager provides input to the Owner and Designer regarding scheduling, pricing, phasing and other input to design a more constructible project. At approximately an average of 60% to 90% design completion, the owner and the construction manager negotiate a 'guaranteed maximum price' for the construction of the project based on the defined scope and schedule. If this price is acceptable to both parties, they execute a contract for construction services, and the construction manager becomes the general contractor.

This Phase will overlap with the Pre-Construction Phase. This Phase would include clearing vegetation from the federal and state ROWs while other ROW negotiations are underway. Activities would also include construction of material sources, clearing and preparing construction camps, placement of radio towers, staging of equipment and labor in various areas, hauling materials and placing fill, excavating high areas, and grading. It would also include installation of culverts and bridges (including driving piles for bridge supports) as well as airstrips, maintenance facilities, and access controls.

Since Phase I construction will most likely start in some portions of the Project area while pre-construction activities are still on-going in other areas, there could be some pre-construction activities (e.g., geotechnical borings, hydrology studies, cultural resource surveys) underway during this Phase.

Summary:

- Years: 2 to 4 – overlaps with Pre-Construction Phase and beginning of Phase II Construction.
- Operations: 1-lane seasonal road, embankment width up to 28 feet and height 30 to 72 inches, 12-foot road lane, 2-foot shoulders, 1-way operation for up to 7 months per year.
- Components: Construction camps, material sites, airstrips, radio towers, maintenance sites and communications equipment, access control (gates), construction equipment, and bridges, culverts, and road embankment.
- Activities: Clearing vegetation from the ROWs, construction of material sources, clearing and preparing construction camps, placement of radio towers, staging of equipment and labor in various areas, hauling materials and placing fill, excavating high areas, and grading. It would also include installation of culverts and bridges (including driving piles for bridge supports) as well as airstrips, maintenance facilities, and access controls. (Potential concurrent Pre-Construction Phase activities may include aerial mapping/photography/LiDAR, survey, water monitoring, wetland delineation, cultural resource modeling and surveys, and drilling in material sites, along alignment, and bridge locations).

Phase II Construction (All-season Roadway)

This Phase would involve the construction of a year-round useable road. This effort would entail additional material extraction, hauling and placing material to expand the Phase I embankment (width and depth), and grading to final slopes. Fiber optic facilities would be trenched into the road embankment during this Phase of construction.

Summary:

- Years: 3 to 4 – including overlap with Phase I.
- Operations: 1-lane year-round road, embankment width up to 44 feet and height 36 to 96 inches, 12-foot road lane, 4-foot shoulders, 1-way road operation.
- Components: Most already put in place during Phase I construction activities, with the addition of fiber optic line in roadway embankment and additional communication equipment at some Maintenance Stations.
- Activities: Continued development or expansion of material sources, construction camp operations, maintenance station operations, some aircraft operations, hauling materials and placing fill, excavating high areas, and grading.

Phase II Operations and Maintenance

Summary:

- Years: 4 to 50

- Operations: 1-lane year-round road, embankment width up to 44 feet and height 36 to 96 inches, 2 12-foot road lanes, 4-foot shoulders, 2-way road operations.
- Components: Use of previously constructed Components.
- Activities: Continued development or expansion of Material Sites, air operations, Maintenance Station operations, hauling materials and placing fill for repairs/maintenance, grading, and removal and reclamation of temporary construction camps not turned into Maintenance Stations.

Phase III Construction (2-Lane Road)

This Phase, if needed, would include additional clearing, additional material extraction, additional excavation where widening road in cut sections or side hilling, additional hauling and placing material to expand the Phase II embankment (width), and additional grading. Culverts would be extended by welding extensions onto the existing culverts. This expansion would create a 2-lane all-season roadway.

Summary:

- Years: 2 to 3 years for the road widening effort – could overlap with the Phase II Operations and Maintenance.
- Operations: 2-lane year-round road, embankment width up to 56 feet and height 36 to 96 inches, 2-way road operations.
- Components: Use of previously constructed Components; expansion of Material Sites; extension of fish passage culverts.
- Activities would include continued development or expansion of material sources, maintenance station operations, air operations, hauling materials and placing fill for expanded roadway, and grading.

Reclamation Phase

Reclamation at the end of the Project would include removal of embankment, culverts, Airstrips, and Maintenance Sites, as well as regrading and revegetation.

Summary:

- Years: 50 to 55
- Operations: Removal of road, no road operations.
- Components: Use of maintenance sites as construction camps, use of communications equipment during reclamation activities, restoration, regrading, and revegetation. Removal of all Components at end of reclamation.
- Activities: Equipment operations to remove fill, regrade, revegetate, restore areas affected by road embankments and associated facilities (airstrips, maintenance stations, material sites).

Attachment H – Amendment and Addendum Log

Change #	Date Revised	Stipulation or Attachment	Line or Paragraph	Revision
<i>Example</i>	<i>Dec 21, 2019</i>	<i>Attachment H</i>	<i>1</i>	<i>Original language which stated “Amendment Log” was changed to “Amendment and Addendum Log”.</i>
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Appendix K. Ambler Road SEIS Scoping Summary Report

Note: This entire Appendix is specific to the Supplemental EIS process only. Therefore, none of the text has been highlighted to indicate new or substantially revised text.

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND
MANAGEMENT

Ambler Road Supplemental Environmental Impact Statement

Final Scoping Summary Report

May 2023



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ABBREVIATIONS

AAP	Ambler Access Project
ANILCA	Alaska National Interest Lands Conservation Act
AIDEA	Alaska Industrial Development and Export Authority
ANCSA	Alaska Native Claims Settlement Act
BLM	Bureau of Land Management
EIS	environmental impact statement
EJ	environmental justice
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gas
NEPA	National Environmental Policy Act
NPS	National Park Service

1 PUBLIC ENGAGEMENT AND SCOPING PROCESS

Public involvement is an integral part of the National Environmental Policy Act (NEPA) process and is required in the preparation and implementation of agencies' NEPA procedures. The Bureau of Land Management (BLM) published a notice of intent to prepare a supplemental environmental impact statement (EIS) on September 9, 2022. The Proposed Ambler Mining District Industrial Access Road (Amber Road) was originally analyzed in the March 2020 final EIS and authorized in a record of decision issued in July 2020. Litigation commenced with suits from multiple parties in August and October 2020. In February 2022, the U.S. Department of the Interior requested the U.S. District Court for Alaska grant voluntary remand, stating that additional legal analysis had revealed deficiencies in the BLM's analysis of subsistence impacts under Alaska National Interest Lands Conservation Act (ANILCA) Section 810 and consultation with Tribes pursuant to Section 106 of the National Historic Preservation Act. The Court granted that request in May 2022, returning the matter to the BLM to correct the identified deficiencies. The supplemental analysis will address deficiencies identified during the litigation process. The scoping period for this supplemental EIS was 45 days and ran from September 9, 2022, to November 4, 2022. The scoping period was announced in the *Federal Register*, local newspaper advertisements, radio announcements, postcard mailers to the mailing list, a BLM news release, and the Ambler Road ePlanning website.

2 COMMENT SUMMARY

In total, 18,977 respondents submitted comments during the scoping period. These comments were submitted via the ePlanning website, email, or mailed-in letters. Of the comment letters, the majority (88 percent) were submitted as form letters (i.e., letters containing identical content), whereas the remainder were either form letters with slight modifications (8 percent) (e.g., one or two unique sentences added, but otherwise identical to a form letter) or unique comment letters (4 percent) (i.e., original letters that did not have identical or almost identical wording as another letter). The 17,427 form letter submissions all originated from seven unique form master letters.

Nearly all respondents were individuals (99 percent), with the exception of those listed in Table 2.1. Individuals who provided their business title or employer information in their letter but did not state that they were an official representative were counted as individuals as opposed to businesses or organizations.

Table 2.1. Respondent Group Types

Respondent Group Type	Respondent Title
Tribes/Alaska Native Claims Settlement Act Corporations and non-profit organizations	Doyon, Limited
	NANA
	Native Village of Kotzebue
	Tanana Chiefs Conference
Businesses and organizations	Alaska Community on Toxics
	Alaska Premier Consulting
	Alaska Soles Broadband chapter of the Great Old Broads for Wilderness
	Alaska Wilderness League
	Alaska Wildlife Alliance
	Associated General Contractors of Alaska
	Audubon Alaska
	Brooks Range Council
	Center for Biological Diversity
	Earthworks
	Fairbanks Climate Action Coalition
	Iniakuk Lake Wilderness Lodge, LLC
	Kuna Engineering
	Michael Baker International
	National Mining Association
	National Parks Conservation Association
	Native Movement
	Northern Alaska Environmental Center
	Resource Development Council for Alaska
	Sea Lion Corporation
	Sierra Club
	The Alaska Support Industry Alliance
	The Wilderness Society
Theodore Roosevelt Conservation Partnership	
Trustees for Alaska	
Western Arctic Caribou Herd Working Group	
Western Interior Regional Alaska Subsistence Regional Advisory Council	
Wilderness Watch	
Winter Wildlands Alliance	
Government agencies	Alaska Department of Natural Resources
	City of Kiana
	U.S. Environmental Protection Agency
	State of Alaska Historic Preservation Office
	U.S. Fish and Wildlife Service

Within each comment letter, individual comments (i.e., stand-alone comments that relate to a single issue, idea, or conclusion) were identified and grouped into one or more of the following categories in Table 2.2. Comment categories are either defined by individual resources that may be affected by the project, individual elements of the project, or specific phases and aspects of the EIS or NEPA process (see Table 2.2). Categories are intended to describe the main topic or resource that is discussed in the comment, regardless of whether the comment is expressing opposition or support for the project as it relates to that topic. Any comments identified within form letters were categorized only once and counted as a single comment no matter how many form letters with that same comment were submitted.

Table 2.2. Comment Categories

Resource Topics	Project Element Topics	EIS/NEPA Process Topics
Air quality and climate	Funding and bonding	Alternatives
Cultural resources	Remand of final EIS	Analysis methods and data: Connected actions
Environmental justice		Analysis methods and data: Cumulative effects analysis
Fish and amphibians: General		Analysis methods and data: General
Fish and amphibians: Salmon		Analysis methods and data: Inadequate methodologies
Geology and minerals		Analysis methods and data: Suggest additional data source
Hazardous waste		Attention/action needed: Request for cooperating agency status
Land use/land management		Attention/action needed: Request for documents or information
Noise		Attention/action needed: Request to be added to mailing list
Petroleum resources		Attention/action needed: Request to confirm receipt of letter
Recreation and tourism		Decision process: Alaska Native Claims Settlement Act
Public health and safety		Decision process: ANILCA 810 analysis
Sand and gravel resources		Decision process: Compliance with other laws
Socioeconomics and Communities		Decision process: Cooperating agency relationships
Soil resources: General		Decision process: Essential fish habitat assessment
Soil resources: Permafrost		Decision process: General
Special designations		Decision process: Government-to-government consultation
Subsistence		Decision process: Mitigation and monitoring
Transportation and access		Decision process: Section 106 consultation
Vegetation		Public and stakeholder involvement: General
Visual resources		Public and stakeholder involvement: Tribal coordination Purpose and need
Water resources		
Wetlands		
Wildlife: Birds		
Wildlife: Caribou		
Wildlife: General		
Wildlife: Marine mammals		

The BLM considered each comment and determined if they were substantive or non-substantive. In performing this analysis, the BLM relied on Section 6.9.2 (Comments) in the BLM NEPA Handbook H-1790-1 (BLM 2008) to determine what constituted a substantive comment. Comments that are not considered substantive include the following:

- Comments in favor of or against the proposed action or alternatives without reasoning that meet the criteria listed above (such as “we disagree with Alternative Two and believe the BLM should select Alternative Three.”)
- Comments that only agree or disagree with BLM policy or resource decisions without justification or supporting data that meet the criteria listed above (such as “a new road should be permitted.”)
- Comments that do not pertain to the project area or the project (such as “the government should eliminate all dams,” when the project is about a right-of-way permit)
- Comments that take the form of vague, open-ended questions

In total, 4,331 individual substantive comments were identified and categorized, as shown in Table 2.3. The five categories that received the most comments were as follows:

1. Subsistence - 9.4 percent
2. Wildlife: Caribou - 7.6 percent
3. Socioeconomic and communities - 6.6 percent
4. Water resources - 6.0 percent
5. Analysis methods and data: Inadequate methodologies - 5.2 percent

Additional details concerning the content of comments and their key points are summarized in Table 2.4.

Table 2.3. Comments Received

Comment Category	No. Comments Received	% Total Comments
Subsistence	408	9.4%
Wildlife: Caribou	333	7.6%
Socioeconomics and communities	287	6.6%
Water resources	261	6.0%
Analysis methods and data: Inadequate methodologies	228	5.2%
Wildlife: General	201	4.6%
Air quality and climate	199	4.6%
Transportation and access	176	4.0%
Fish and amphibians: General	174	4.0%
Remand of final EIS	154	3.0%
Geology and minerals	133	3.0%
Analysis methods and data: Cumulative effects analysis	131	2.9%
Cultural resources	125	2.8%
Analysis methods and data: General	115	2.6%
Decision process: General	104	2.4%

Comment Category	No. Comments Received	% Total Comments
Public and stakeholder involvement: Tribal coordination	101	2.3%
Alternatives	98	3.4%
Hazardous waste	92	2.1%
Public health and safety	90	2.1%
Public and stakeholder involvement: General	89	2.0%
Special designations	81	1.8%
Decision process: Mitigation and monitoring	75	1.6%
Environmental justice	56	1.3%
Vegetation	55	1.3%
Soil resources: Permafrost	54	1.2%
Decision process: ANILCA 810 analysis	52	1.2%
Fish and amphibians: Salmon	51	1.2%
Decision process: Compliance with other laws	48	1.1%
Analysis methods and data: Suggest additional data source	40	< 1%
Decision process: Section 106 consultation	39	< 1%
Recreation and tourism	38	< 1%
Land use/land management	36	< 1%
Wetlands	32	< 1%
Funding and bonding	29	< 1%
Noise	23	< 1%
Sand and gravel resources	16	< 1%
Analysis methods and data: Connected actions	15	< 1%
Decision process: Government-to-government consultation	14	< 1%
Purpose and need	11	< 1%
Attention/action needed: Request to confirm receipt of letter	10	< 1%
Visual resources	10	< 1%
Wildlife: birds	10	< 1%
Decision process: Cooperating agency relationships	7	< 1%
Attention/action needed: Request for cooperating agency status	5	< 1%
Decision process: Essential fish habitat assessment	5	< 1%
Decision process: Alaska Native Claims Settlement Act	4	< 1%
Soil resources: General	4	< 1%
Attention/action needed: Request to be added to mailing list	3	< 1%
Attention/action needed: Request for documents or information	2	< 1%
Wildlife: Marine mammals	1	< 1%
Total	4,331	100%

Table 2.4. Comment Summary

Comment Category	Summary of Key Points
Process Comments	
Alternatives	<p>Commenters suggested that the BLM expand their list of alternatives to include a transport corridor that travels west to the Bering Sea, not east to the Dalton Highway; a railroad corridor that may or may not be spurred from the existing Red Dog Mine; aircraft access to mine sites; a no road alternative; and an alternative that includes increased environmental mitigation measures. Most comments sought to offer alternatives that would mitigate the footprint of the project. Some commenters criticized the lack of distinction between the alternatives in the 2020 EIS and stated that the BLM should provide a varied range to meet NEPA requirements of a “reasonable range of alternatives.” Many commenters believed the phased approach to construction was not appropriate. Some commenters expressed concern that the EIS did not attempt to minimize impacts or reduce the size of the right-of-way.</p> <p>Two commenters questioned the necessity of the entire concept of soliciting new alternatives, because alternatives were not identified as an issue during the remand process.</p>
Analysis methods and data: General	<p>Many commenters listed resources that should be included in the analysis, as well as completing direct, indirect, and cumulative impacts analysis of those resources. Several commenters stated that without knowing how many or the maximum number of mines that could be built in the future, it is impossible to analyze impacts on resources. One commenter requested incorporating impacts from other resources into the subsistence analysis. One commenter requested that an independent multi-agency team be assembled to analyze the impacts. One commenter requested information about how the BLM is complying with their programmatic agreement obligations.</p>
Analysis methods and data: Inadequate methodologies	<p>Several commenters listed environmental, economic, and cultural resources that were not sufficiently analyzed due to a lack of baseline data, rushed analyses, and lack of any impact analyses from potential mines. Analyzing the road without analyzing the mines at the same time underestimates the impacts and goes against NEPA requirements. Several commenters noted that the mitigation plan did not have detailed goals and objectives to ensure implementation of mitigation was sufficient. Some commenters expressed concern that the scope of analysis was too narrow, and the analysis area of impacts was too small. Some commenters also claimed the information pertaining to the design for the road, bridges, and culverts was inadequate. One commenter stated that by leaving off Indigenous names for places, their cultural significance was not captured.</p> <p>Some commenters stated that doing a supplemental EIS was inappropriate.</p>
Analysis methods and data: Suggest additional data source	<p>Commenters suggested that additional data sources for the supplemental EIS be used for various resources, including published journal articles, information from State and Federal agencies, and publicly available reports.</p> <p>Some commenters requested that more information be obtained from Tribes with local knowledge of the areas, including updated Tribal names for places. Commenters requested that ethnographic work be conducted to capture all of the relevant Tribal name information.</p>
Analysis methods and data: Cumulative effects analysis	<p>Commenters requested a thorough evaluation of cumulative effects for all resources. Several commenters expressed concern about cumulative impacts on subsistence harvest. Many commenters stated that mining impacts need to be clearly defined so that proper cumulative effects can be evaluated. Commenters stated that evaluating the mines separate from the road is not appropriate when considering cumulative effects. Several commenters noted that the road could be open to the public via a lawsuit for public land access, and that these impacts should be included in the cumulative effects analysis. Some commenters pointed to potential projects that have been proposed since the EIS that should be added to the cumulative effects analysis.</p> <p>One commenter suggested that cumulative effects should not be analyzed because this was already completed in the previous EIS.</p>
Analysis methods and data: Connected actions	<p>Commenters requested a thorough evaluation of connected actions for all resources. Many commenters felt that the BLM failed to include mining impacts as a reasonably foreseeable and connected action. Commenters stated that by not including the effects from mining, the BLM did not properly evaluate impacts.</p> <p>One commenter stated that the BLM underestimated the infrastructure necessary for this road, saying there would also need to be 41 gravel mines for road construction, processing facilities, tailings disposal areas, ore/export terminals, gas stations, and ports.</p>

Comment Category	Summary of Key Points
Attention/action needed: Request for cooperating agency status	The State of Alaska requested cooperating agency status.
Attention/action needed: Request to be added to mailing list	Two commenters requested to be included on the mailing list to remain updated on the proposal and to receive announcement of the availability of the draft supplemental EIS and all other documents, reviews, and comments.
Attention/action needed: Request to confirm receipt of letter	Commenters requested confirmation of receipt of their comments and attachments. One commenter requested a letter describing the alternatives the BLM proposes to address, eliminate, minimize, and mitigate their particular concerns.
Attention/action needed: Request for documents or information	One commenter requested dates for completion of the supplemental EIS.
Decision process: ANILCA Section 810 analysis	<p>Several commenters requested a thorough evaluation of impacts to subsistence under Section 810 of ANILCA. They felt that the previous analysis was insufficient.</p> <p>Several commenters emphasized that the scope should be limited to Section 810 of ANILCA and be completed in an efficient and timely manner. Some commenters suggested that the Section 810 analysis should be completed independent of the NEPA analysis.</p>
Decision process: Alaska Native Claims Settlement Act (ANCSA)	<p>Commenters requested a more detailed evaluation of protective measures, and an investigation into whether the project would coincide with existing 17(d)(1) lands of ANCSA.</p> <p>One commenter suggested that the project would create economic opportunity for all Alaskans through exploratory mining on ANCSA lands, and proper interagency collaboration would ensure the protection of waterways and natural resources.</p>
Decision process: Compliance with other laws	<p>Commenters stated the project needed to be consistent with the following: Tribal treaty rights, the BLM's congressional mandate to sustain the health of the land, Clean Water Act, Compensatory Mitigation for Losses of Aquatic Resources: Final Rule, court rulings, Defense Production Act, Section 810 of ANILCA, Clean Water Act Section 404 Permit, Section 106 of the National Historic Preservation Act, constitutional mandates from the State of Alaska to provide for the maximum benefit of the people of the State of Alaska, Section 201(4)(b) of ANILCA, Thirty by Thirty Executive Order, the BLM Manual Section 1794 and Handbook 1794-1, Alaska Department of Natural Resources, Bald and Golden Eagle Protection Act, Federal Land Policy and Management Act's substantive requirements, National Ambient Air Quality Standards, Rivers and Harbors Act, ANILCA Title XI's Substantive and Procedural Requirements, Endangered Species Act, Materials Act, Migratory Bird Treaty Act, Customary and Traditional Use Determination for sheefish and chum salmon, Wilderness Act, Noise Control Act, Quiet Communities Act, Consultation and Coordination with Indian Tribal Governments, Article 32.2 of the United Nations Declaration on the Rights of the Indigenous Peoples.</p> <p>One commenter was concerned about the legality of any projects approved during the tenure of BLM Director William Pendley. They requested that proof be provided that the project is not subject to a court order requiring reversal of any decisions William Pendley made while acting as BLM director.</p>

Comment Category	Summary of Key Points
Decision process: Cooperating agency relationships	<p>Commenters were split on if cooperating agency relationships have or have not been sufficient. Some comments argued that sufficient cooperation has occurred through NEPA and ANILCA 810 analysis. Other comments have stressed the need for a multi-agency organization to ensure consistent policies across various jurisdictions during project construction. Commenters noted that this would resemble the Joint Fish and Wildlife Advisory Team for the Trans-Alaska Oil Pipelines System.</p> <p>One commenter stated that the BLM, National Park Service (NPS), and the U.S. Army Corps of Engineers evaluated different proposals. Another commenter stated that other government agencies should not be consulted because the BLM has no jurisdiction over them. One commenter stated that the NPS should actively participate in and sign onto the revised subsistence evaluation because it would impact NPS lands.</p>
Decision process: Essential fish habitat assessment	<p>Commenters emphasized the need for a fish habitat assessment due to the connection between fish and subsistence in the region. Several comments urged the BLM to analyze how project related activities (trails, mining, etc.) would affect essential fish habitat in streams, wetlands, and Kobuk Lake. One commenter urged the BLM to not rely on the State of Alaska’s Anadromous Waters Catalog due to inaccurate data.</p>
Decision process: General	<p>Several commenters requested a more complete evaluation of all issues, including foreseeable mines and the possibility of Ambler Road opening to the public before a new decision is made.</p> <p>Many commenters expressed the desire for the process to focus only on those issues specifically listed in the court order to ensure an efficient and timely process. Some commenters stated that a supplemental EIS is not the correct course of action given that there are no new circumstances or information since the previous decision.</p>
Decision process: Government-to-government consultation	<p>Many commenters stated that government-to-government consultation has not occurred, because Tribal councils were not properly consulted. One commenter stated that government-to-government consultation should not be analyzed because it was not part of the court order.</p>
Decision process: Mitigation and monitoring	<p>Commenters requested clear mitigation and reclamation plans that include compensatory and other mitigation measures to address environmental effects. They requested that the mitigation measures are clear about non-BLM-managed lands and monitoring responsibilities. Commenters stated that the monitoring plan should include clear goals and objectives to determine the effectiveness of the mitigation measures. One commenter noted that closing the road after 30 to 50 years would not allow monitoring to take place. Some commenters noted that restoration mitigation is difficult in this area.</p> <p>The U.S. Fish and Wildlife Service laid out several mitigation measures addressing the court order to reevaluate subsistence impacts. These mitigation measures included the following resources: eagles, migratory birds, floodplain connectivity, sheet flow connectivity, water quality, wetlands and riparian buffers, revegetation and restoration, nonnative species, subsistence, sheefish, caribou, road design and construction practices, erosion control, hazardous material, air quality, and fish passage.</p>
Decision process: Section 106 consultation	<p>Several commenters requested a full and complete Section 106 consultation, which includes meaningful consultation with Tribal councils and villages. Given limited internet availability throughout Alaska, this includes meeting with Tribal councils in person outside of hunting and harvesting seasons. One commenter requested ethnographic studies and updates to place names.</p>
Funding and bonding	<p>Many commenters are opposed to the State of Alaska providing funding for Ambler Road. They stated that this would cost Alaskans in the long run through construction and maintenance costs. They were also against the State subsidizing companies that would make profit, especially a foreign company. Several commenters noted that the State of Alaska has not put forth a plan for how to pay for the road or its maintenance needs over the next several years. One commenter requested that the supplemental EIS evaluate the financial viability of the project. Other commenters expressed concern that the project has no Federal financial backing, and should it fail, there is no backup plan in place. One commenter noted that past Alaska Industrial Development and Export Authority (AIDEA)–funded projects are neither sustainable nor affordable.</p>

Comment Category	Summary of Key Points
Public and stakeholder involvement: General	<p>Commenters requested a comment period extension and stated that the BLM failed to hold public meetings during the comment period despite indicating in the scoping notice that there would be public meetings. Commenters suggested that the BLM should provide AIDEA and the public with a complete, detailed schedule, scope of work, and public outreach plan for the supplemental EIS and decision document. Commenters suggested that prior to the public comment period on the draft supplemental EIS, the BLM should compile all the concerns and issues identified through scoping and share them with all stakeholders to inform comments on the draft supplemental EIS. Commenters suggested that the BLM should include sending copies to each community within the caribou herd range, supplement data from local knowledge, and host workshops with the public in rural communities with translators to identify key issues and potential resolutions in a collaborative environment. Commenters suggested that the supplemental EIS should discuss public participation and how the public can get information on mitigation effectiveness and monitoring results.</p> <p>Several commenters expressed concern that the comment period was too short, occurred during hunting and harvesting seasons, and the BLM did not attend enough in-person meetings to capture local concerns.</p> <p>Some commenters suggested that critical metrics (the number, types, and sizes of individual mines; the number of on-site mining and support personnel; the mining footprint including the aggregate area of connecting roads between the individual mines, communities and the Ambler Access Project (AAP); numbers of airplane and helicopter overflights; daily traffic levels on the AAP and connected roads by vehicle type; primary sources and levels of noise; and other relevant potential sources of disturbance to caribou and other wildlife) must be made available to the public.</p> <p>Other commenters believed scoping was not required by the supplemental EIS because there were no changes in the proposed project nor new information that triggered scoping.</p>
Public and stakeholder involvement: Tribal coordination	<p>Several commenters expressed concern about the scoping period and process for Tribal communities. Scoping overlapped with critical subsistence hunting and harvesting seasons, so many members could not participate. Furthermore, several commenters requested in-person meetings and public postings in town to communicate with Tribal members because many do not have access to the internet. One commenter suggested a liaison to update the contact information for Tribes that want to receive updates on the project.</p> <p>Several commenters requested meaningful consultation with Tribes, which includes clear communication and in-person meetings that Tribal members can attend. One commenter specifically requested plain-language communication so that Tribal members with varied reading proficiencies can understand the project better.</p>
Purpose and need	<p>Many commenters objected to the purpose and need of the project, with several stating it was too narrow in scope (i.e., by specifying that access should be technically and economically practical), which restricted the agencies consideration of a reasonable range of alternatives.</p> <p>Several commenters stated that the purpose and need statement in the supplemental EIS should be broad enough to encompass meaningfully different alternatives to the proposed road for the purposes of accessing and developing the Ambler Mining District.</p>
Remand of final EIS	<p>Commenters believed that the previous analysis was rushed, insufficient, and downplayed threats to natural resources and cultural resources. They agreed with the remand process.</p> <p>Some commenters believed that analyzing impacts already fully addressed in the final EIS and joint record of decision is a waste of resources and will further delay development of the project. They want the supplemental EIS to be expedited and only address what was discussed in court.</p> <p>Many commenters expressed concern that the scope of the analysis exceeded the deficiencies identified in the court ruling. They requested that the scope of the analysis be limited to what is required, reducing the time and expenses needed to analyze resources that were already approved by the court. Several commenters believed the scope of the supplemental EIS should be limited to the portion of the project that crosses BLM-managed land within the far eastern portion of the project route.</p>

Comment Category	Summary of Key Points
Natural Resource Comments	
Air quality and climate	<p>Commenters expressed concern regarding the impacts to air quality arising from dust and debris that would be created during construction and operation of the road. Commenters requested that the supplemental EIS take particular care to analyze the cumulative effects of disturbed asbestos on air quality regarding wildlife, plants, and local people.</p> <p>Most commenters stated that the project would significantly increase greenhouse gas (GHG) emissions. When discussing climate, some commenters discussed how higher GHG emissions may affect other resources as well, particularly increased wildfire frequency and decreased water quality from higher temperatures. Some commenters suggested that the effects of the project would not allow the United States to meet their emissions goals set out by Executive Order 13990 and the Paris Agreement. Other commenters expressed concern that the project would exacerbate melting permafrost, along with its potential for methane contributions. Commenters urge the supplemental EIS to analyze any impacts to permafrost. Many commenters suggested the need for a cumulative analysis on the impact for GHG emissions from the proposed road and any mining activities that would follow.</p> <p>One commenter stated that the potential to mine resources would benefit the development of renewable energy systems, which would offset adverse effects to climate change and would align with national interests.</p>
Fish: General	<p>Many commenters stated that the project would have substantial impacts on fish and fish habitat</p> <p>Commenters expressed concern about road-specific factors harming fish resources. The multitude of stream crossings and culverts, sedimentation during construction and maintenance, and water withdrawals associated with the road were the main points of concern for many commenters. Several respondents requested more information regarding the engineering and design parameters of the project culverts. Other commenters voiced concern about how mining operation could impact fish through mining pollution from potential tailing spills and acid-rock drainage.</p> <p>Some commenters expressed concern about the degradation of Kobuk River fisheries and how that would affect the subsistence and socioeconomic needs of Indigenous people and commercial fishers. Specifically, some commenters requested additional analysis on how the project would affect Kotzebue Sound's fishery.</p> <p>Commenters expressed concern about contaminated water resources' impact on the ecology of the area. They state that changes to natural water chemistry parameters and water temperature may reduce egg survival and affect fish populations. Commenters suggest the steady flow and settlement of dust and contaminated particulates into waterways would render them murky and silt laden. Commenters stated that gravel-covered channel bottoms would become clogged or covered to the detriment of fish and bottom dwelling organisms, the underpinnings of aquatic ecology.</p> <p>Other commenters mentioned the need for updated fish habitat assessments, stream flow patterns, and analyses of sulfide mineral deposits in project vicinity waterways. Commenters believed that bridging these data gaps will provide a fuller picture of the project's potential effects on fish.</p> <p>One commenter discouraged acquiring new fish data, concluding that the supplemental EIS would be treading on material already covered in the original EIS.</p>
Fish: Salmon	<p>Commenters requested that the supplemental EIS contain additional baseline information about anadromous fish habitat and salmon populations. Commenters stated that the project would have negative implications for chum salmon spawning in the Kobuk River due to fish passage barriers and road/mining pollution. More specifically, commenters suggest the impacts would hurt the Kotzebue Sound commercial fishery and hinder subsistence practices that rely on salmon. Commenters suggested that the supplemental EIS should consider the cultural, subsistence, and economical costs if salmon runs were to be depleted by the project road and mines.</p>
Geology and minerals	<p>Some commenters stated that the proposed action would allow for the acquisition of metals that are key in making the transition to renewable energy. Other commenters expressed concern about the potential for mine waste, particularly copper mine waste and asbestos dust, to adversely affect the environment.</p> <p>Many commenters identified gaps in the final EIS that they requested be analyzed in the supplemental EIS. The respondents requested that the supplemental EIS consider the effects of future mine operations, and associated mine infrastructure (gravel pits, spur roads, processing facilities, tailings disposal areas, gas lines, etc.) that would be permitted by the project's construction. Respondents cited this as part of the NEPA process to analyze foreseeable actions. One comment requested that the supplemental EIS include a worst-case analysis approach to the impacts of the road and mining activity and an analysis on which minerals are truly considered "critical" and why.</p>

Comment Category	Summary of Key Points
Sand and gravel resources	Commenters requested that the supplemental EIS consider the impacts of gravel mining for road construction and requested the quantity or quality of gravel available for the project. Some commenters asked for analysis on how gravel pits would impact water quality and caribou foraging.
Soil resources: General	Commenters expressed concern that the construction of roads and associated infrastructure would also compact and compress sensitive soils, thus changing hydrology, runoff characteristics, and ecological function of the area, affecting flows and delivery of pollutants to waterbodies directly influencing the quality and quantity of local subsistence resources. Many stated that the supplemental EIS should include information about the types of soil along the right-of-way.
Soil resources: Permafrost	Commenters stated that the construction, maintenance, and use of the road and its river crossings would negatively impact permafrost conditions, causing the release of GHGs into the atmosphere. Commenters requested the supplemental EIS provide baseline information on permafrost resources and create estimations about thawing and releasing of permafrost and its interaction with the carbon cycle. Commenters suggested evaluating how permafrost melting would impact the entire ecosystem, both living and non-living resources.
Vegetation	Commenters were concerned that the construction, maintenance, and use of the road and its river crossings would negatively impact vegetation. They stated that a decrease in quantity or quality of vegetation would negatively impact the entire ecosystem that relies on it. Many noted that activities of the road would introduce invasive species, asbestos, metals, and dust to native vegetation.
Water resources	<p>Commenters expressed concern about the waterways the proposed road, bridges, and culverts would impact. They stated that the EIS lacked adequate baseline mapping of aquatic resources and expressed concern about the pollution of drinking water, streams, wild and scenic rivers, and other water resources from sediment, acid rock, dust, and metal-leaching waste materials. Commenters expressed concern about the wildlife and aquatic habitat that relies on contaminated water sources. Commenters stated that the BLM has acknowledged that even with expected mitigation actions, water quality could suffer from the construction of the road itself and the operations of the mines it would serve. They state that mitigation measures such as water and sanitation projects should be addressed.</p> <p>Commenters expressed concern about the impacts of hazardous waste storage methods and potential spills on the water quality in the watershed. They state that there should be information about how much water is necessary for the project, and a revised subsistence evaluation needs to include meaningful analysis of the water withdrawals from surface water. Commenters request that no EIS be approved nor permits issued until the locations and amounts of water withdrawals are specified.</p> <p><u>Recommendations for the supplemental EIS</u></p> <p>Commenters noted that the supplemental EIS should catalogue and map all aquatic resources; address potential changes in water flow, dewatering, and culvert and bridge design and costs; be compliant with the Clean Water Act, Rivers and Harbors Act, and stormwater permitting requirements; identify all drinking water sources and potential impacts and mitigation measures; detail how ongoing water restoration efforts would be impacted; and analyze impacts to outstandingly remarkable values and wild and scenic rivers.</p>
Wetlands	Commenters expressed concern that the Ambler Road would destroy 1,400 acres of wetlands. They were worried that pollution would put wetlands at risk. Commenters stated that there is no plan for the compensatory mitigation for loss of wetland function, required by the Clean Water Act. Commenters noted that the mandate of “no net loss” of wetlands dictated by the Clean Water Act cannot be fulfilled without compensatory mitigation of lost wetlands. Commenters stated that no Section 404 permit should be issued without an appropriate compensatory mitigation plan. Commenters noted that negative impacts in wetlands can impact that entire ecosystem. Commenters stated that the Brooks Range wetlands are intact and working to maintain a stable climate system, but a full account of the disruption to these wetlands has not been included in the EIS.
Wildlife: Birds	<p>Commenters stated that the supplemental EIS should consider the dust, noise, and light pollution impacts on birds. Commenters expressed concern that the proposed road would be an intrusion on the habitat that migratory and resident birds rely on. Some commenters expressed concern that the future of sensitive songbirds (e.g., blackpoll warbler) and sandhill cranes would be impacted. Commenters stated that the project could affect birds in numerous ways, including direct and indirect habitat loss, changes in predation and food availability, noise impacts to bird communication, and light pollution affecting navigation and habitat use.</p> <p>Several comments were made regarding eagle disturbance and take prohibition noting the existence of paired eagles and active nests in the project area and citing the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act.</p>

Comment Category	Summary of Key Points
Wildlife: Caribou	<p><u>Migration</u></p> <p>Commenters expressed concern that Ambler Road would disrupt or deter the migration path of the Western Artic Caribou Herd. The proposed road would bisect the migration routes of two other caribou herds, and commenters were concerned that their movements could be impacted as well. Commenters stated that roads have been known to change migration patterns, often re-routing and slowing herds. Commenters suggested wildlife overpasses should be considered to enable caribou migration. Commenters believed the road would lead to an increase in roadkill incidents. Commenters expressed concern about behavioral changes such as foraging behavior and energy expenditure of caribou and were concerned that these changes could impact reproductive success.</p> <p><u>Subsistence</u></p> <p>Commenters expressed concern that Ambler Road and its associated construction and maintenance activities would negatively impact the communities who depend on caribou for subsistence, causing an issue of food security. Commenters stated that without caribou, subsistence hunters would have a hard time finding meat, and their culture and traditions would be negatively affected. Commenters noted that by limiting the caribou hunts, Tribal communities may have to rely on expensive imported food outside traditional diets. Commenters stated that Ambler Road may also increase hunting pressure on non-local hunters. Commenters stated that mosses, lichen, and vegetation can accumulate metals in their tissue. They are concerned that caribou may consume contaminated lichen harming subsistence users harvesting the caribou and the caribou themselves.</p> <p><u>Habitat</u></p> <p>Commenters believed building the road would result in habitat fragmentation, displacing caribou from portions of their historic range, thus reducing their options to selectively use the best habitat. Commenters stated that habitat fragmentation can eventually reach a point where caribou numbers decline. Commenters requested that the supplemental EIS examine the spatial needs of caribou, noting that caribou distribute themselves to use the changing combinations of food biomass, accessibility, low insect and predator abundance, and areas of low hunting pressure.</p> <p><u>Ecosystem health</u></p> <p>Commenters requested that the supplemental EIS address the significant negative impacts on caribou that would lead to a population decline that would disrupt the entire ecosystem. Commenters stated that caribou foraging prevents the growth of plants that will insulate the ground. Commenters noted that, because of this, caribou aid in cooling the soil temperature by a few degrees, thus keeping permafrost frozen.</p> <p><u>Food</u></p> <p>Commenters expressed concern about how dust, asbestos, copper, and toxic sludge from gravel projects would impact Western Artic Caribou Herd foraging. Commenters stated that any detrimental effects to lichen availability or quality would impact caribou, especially during winter months. Commenters expressed concern that the toxic chemicals, dust, and hazardous waste would get into the water and food sources of caribou, leading to a decrease in population.</p>
Wildlife: General	<p>Commenters expressed concern that the project would permanently fragment and degrade wildlife habitat and ecosystems. They expressed concern on how dust, asbestos, petroleum spills, vehicle traffic and noise, GHG emissions, and increased public access would affect wildlife and their habitat. Commenters expressed concern that toxins and metals would seep into vegetation, impacting wildlife food sources. Commenters noted additional concerns include negative effects on animal reproductive and denning behavior.</p> <p>Commenters requested that the supplemental EIS provide a reasonable assessment of direct, indirect, and cumulative impacts, both short term and long term, of this road to wildlife populations and habitat. Commenters stated that baseline information about project design, fish, caribou, wildlife, and wetland resources was missing from the previous EIS and needs to be included in the supplemental EIS. Commenters requested that the supplemental EIS include an analysis of impacts to the approximately 200 species of vertebrates and invertebrates thought to exist in the project area. Commenters stated that the supplemental EIS should have a section on threatened and endangered species. Commenters stated that the supplemental EIS must analyze the location and projected amount of aircraft traffic at the new airstrips being proposed. Commenters noted that aircraft may have negative impacts on wildlife and subsistence in a broad geographic area, depending on flight patterns.</p> <p>Commenters suggested that wildlife overpasses and underpasses be considered to enable migration. Commenters also expressed concern about public access increasing hunting pressure on animals.</p>

Comment Category	Summary of Key Points
Wildlife: Marine mammals	One commenter expressed concern about the developments' contaminants negatively affecting marine life.
Resource Use and Social Systems Comments	
Cultural resources	<p>Commenters expressed concern about the loss of traditional cultural resources, including historic areas, sacred sites, traditional hunting grounds, and archeological resources. Most comments aligned the potential loss of subsistence opportunities, particularly regarding caribou, as damaging to cultural practices and traditions of Indigenous communities.</p> <p>The U.S. Environmental Protection Agency (EPA) and others commented that Traditional Ecological Knowledge should be integrated into NEPA analysis, as well as adaptation and resilience planning.</p>
Environmental justice	<p>Commenters expressed concern about the tangible engagement of impacted communities, specifically regarding the ability for isolated, non-English speaking villages and individuals who are directly impacted by the project, to meaningfully participate.</p> <p>In general, commenters recommended the following NEPA approach for incorporating environmental justice (EJ) analysis: identification of communities with EJ concerns, any potential disproportionate impacts to communities with EJ concerns from the proposed project, the processes to meaningfully engage communities with EJ concerns throughout the NEPA analysis, and steps taken to address EJ concerns.</p> <p>Commenters suggested the following tools for use in evaluating the EJ project impacts – EJSscreen and “Environmental Justice Interagency Working Group Promising Practices for EJ Methodologies in NEPA reviews” report. Commenters stated that the supplemental EIS should consider EJSscreen information for the block groups that contain the proposed action and a one-mile radius around those block groups.</p> <p>Commenters recommended consulting with local and State agencies to supplement data in EJSscreen because some data are not included for Alaska. Comments also provided specific steps to incorporate EJ into the NEPA feedback process itself, including the direct identification and engagement of impacted communities through best practices, interpretation services, text translation, reducing the burden of participation, alternatives to online information dissemination, and extended comment period timelines.</p> <p>One comment specifically recommended complying with the Justice 40 Initiative and advocates that 40 percent of Federal resources being spent on environmental review should be used to increase participation of the villages and EJ communities throughout the environmental review process.</p> <p>Comments of significant concerns were expressed by organizations and individuals over the harm to the local resident and community traditional cultural heritage, subsistence way-of-life practices, food equity, food sources, habitat degradation, ecological disruptions, health impacts, social disruption, water quality deterioration, social conflict, competition for resources, wilderness health, spawning habitat sedimentation, economic hardship, burden of participation during hunting and gathering seasons, and persistent long-term cumulative impacts to the healthy functioning of the existing communities.</p> <p>Comments stated that community feedback should be reflected in decision making and should make explicit suggestions to include a detailed write-up of input received and how input was incorporated should be included in the NEPA document.</p>
Hazardous waste	<p>Commenters asked that the supplemental EIS consider all potential impacts of the project that contribute hazardous materials. Commenters stated that these hazards are associated with construction and maintenance of the road, including runoff, exposing asbestos dust, and impacts associated with mining, including tailings and acid rock drainage.</p>
Land use/land management	<p>Several commenters stated that the land use around the proposed Ambler Road should remain open and roadless and be used as wilderness instead of for development. One commenter questioned how the rest of the road would be managed outside of BLM jurisdiction. One commenter did not want a bridge over waterways that are currently used for rafting.</p>
Noise	<p>Several commenters expressed concern about the impacts of noise on the surrounding wilderness areas, including the Gates of the Arctic Wilderness. Commenters stated that increases in noise would come from mining operations, traffic, trucks, and aircraft. Some commenters noted the impacts to subsistence through noise impacts to wildlife, particularly caribou. One commenter requested that sound barriers be considered to reduce these impacts.</p>

Comment Category	Summary of Key Points
Public health and safety	<p>Commenters expressed concern about the health impacts from project activities and waste that comes from it, such as asbestos, dust, runoff, and toxic spills that could impact air, water, subsistence resources, and land quality. Commenters expressed concern about “man camps” from outside construction workers that create risks regarding drugs, alcohol, noise, crime, and sexual violence. Commenters noted that Indigenous women are murdered or go missing at a rate 10 times higher than any other ethnicity, much of which is perpetrated by male workers and people from outside the community.</p> <p>Commenters think both mental and physical health should be analyzed for the supplemental EIS. Commenters noted that factors that contribute to local communities’ health impacts are adoption of Western diets (which has been shown to diminish the health of Indigenous populations that rely on their traditional foods), carcinogens (asbestos) spread through fugitive dust (which can cause pulmonary disease, lung cancer, and mesothelioma), and spills that contaminate water sources (which impacts game and vegetation). Commenters noted the supplemental EIS should include a review of the health impact assessment and supplement information, as appropriate from local Tribes and EJ screening tools.</p>
Recreation and tourism	<p>Many commenters discussed the value of primitive/wilderness recreation experiences in the state, and most agreed that the road is a potential threat to recreationists, local recreation businesses, and recreational hunting.</p> <p>Commenters expressed concern that the previous EIS downplayed the potential threats from the road to recreation, especially concerning the potential influx of hunters and recreationists into the area. Commenters noted that although the road would be restricted when built, many believed that lawsuits would lead to the road becoming public, which then would lead to the influx of users.</p> <p>One commenter expressed support for the road to open the area for further recreation and tourism opportunities.</p> <p>One commenter discussed the conflict between local and non-local hunters and the potential impact that hunting aircraft has on caribou behavior and local hunter success.</p>
Socioeconomic and communities	<p>Commenters expressed concern that the road would facilitate resource development and economic opportunities for the State of Alaska and boost Alaska’s economy and provide mineral resources. Commenters wanted the road to bring jobs and lower prices for goods to the community, allowing for self-sustainability for the Tribes. Many commenters wanted the project to start because they are relying on the jobs provided by the project. Commenters believed that the road would decrease transportation and cargo costs, lowering prices in that area.</p> <p>Commenters requested that the BLM be clearer about the types and numbers of jobs offered and the qualifications for these jobs. Commenters noted that historically, construction jobs are temporary and often given to non-local peoples, increasing the risk of drugs, alcohol, and violence.</p> <p>Commenters expressed concern that the development could lead to a loss of subsistence resources, making communities more reliant on cash economy and expensive and less nutritious foods. Commenters noted that many unique local cultures that “benefited” from industrial development rightfully leave locals wondering if they wish to be part of this process. Commenters stated that local cultures are diluted and invaded by outside influences. Commenters noted that resulting wealth often arises along with wealth disparity, changing community structure and leaving the most disadvantaged behind.</p> <p>Commenters expressed concern that the revenue from this development and future mine developments does not benefit the local community. Commenters are also concerned that small businesses such as guiding services, fisheries, and recreational lodges may see decreased economic growth due to construction and mining activities.</p> <p>Commenters think the supplemental EIS should provide an analysis of the socioeconomic impacts of the road. Commenters expressed concern about how the price of goods would be impacted. Commenters noted that the supplemental EIS should incorporate communities’ socioeconomic concerns and engage the community for decision making about these issues.</p>
Special designations	<p>Commenters noted that NEPA confers an obligation to fully consider the direct, indirect, and cumulative impacts of a proposal on protected areas like wilderness and wild and scenic rivers. Commenters noted that the analyses to date have failed in this regard, and any upcoming supplemental process must correct the shortcoming. Commenters expressed concern that this area is one of the last roadless areas, and development is irreversible for these pristine, scenic designated areas, which have been given wilderness character. Commenters noted that the Brooks Range, Kobuk Wild and Scenic River, Arctic Preserve, and Gates of the Arctic National Park would be impacted. Commenters want permanent protection for this corridor.</p> <p>Commenters requested that the NPS reopen its environmental and economic analysis process to update that analysis to ensure the agency is acting on complete information about that project and that any NPS authorizations are consistent with other agency authorizations.</p>

Comment Category	Summary of Key Points
Subsistence	<p>Most commenters stated that the initial environmental review performed by the BLM did not adequately analyze project impacts (construction and use of the Ambler Road as well as mining activities) to subsistence way of life. Specifically of concern to many commenters is the migration route of the Western Arctic Caribou Herd, the population effects of the project on caribou, the health of subsistence communities, the disruption of subsistence activities, and the destruction of the way of life for Indigenous and Tribal peoples. Many commenters expressed concern that known causes of migration disturbance, like road construction and use, are not being adequately considered and additionally express that impacts to the caribou population and migration would burden Alaskan native villages/Indigenous cultures unfairly. They expressed concern that the project could destroy their culture and traditional way of life. Commenters noted that many residents of Interior and Western Alaska have a customary and traditional use determination for the Western Arctic Caribou Herd.</p> <p>Many commenters stated that impacts to subsistence, sport, and commercial fisheries are not adequately considered and that the project would negatively impact important species and their habitats—causing cultural and economic harm to local communities and peoples who operate fisheries downstream of the project. One commenter wanted to understand the relationship between increased financial capabilities in the region and decreased subsistence opportunities.</p> <p>Many commenters expressed dissatisfaction with the consideration of aquatic species affected in the project area. Commenters stated that sheefish and salmon species and their habitats (Kobuk River and tributaries, among others) would be impacted by the project and mining activities. Specific comments discussed that sheefish is a critical species that upper Kobuk River residents rely on and harvest during migration seasons and that the Kobuk River is one of only two areas where sheefish spawn. Commenters noted that the Kobuk River supports the largest population of spawning sheefish in northwestern Alaska and is one of only two spawning areas for sheefish in the Northwest Arctic region. Commenters stated that sheefish is considered a key species of the Selawik National Wildlife Refuge. The EPA recommends supplementing agency analysis of sheefish, whitefish, and salmon throughout the supplemental EIS with Traditional Ecological Knowledge. Commenters noted that residents of Interior and Western Alaska have a customary and traditional use determination for sheefish and chum salmon.</p> <p>Comments expressed concern about the following impacting subsistence: salmon and spawning habitat destruction, water contamination and runoff, air pollution, permafrost impacts, wildlife behavior and population impacts of road construction and mining operation, climate change, food chain impacts, aquatic habitat deterioration, hunting resources and competition, public use of the road, effects of the project on sheefish population health, safe drinking water, wilderness destruction, landscape and scenery destruction, destruction of historic and sacred areas, adverse public health impacts to the local communities, increased crime, introduction and spread of invasive species, increased wildfire risks, more use of local infrastructure, mine dewatering impacts, acidic rock impacts on the ecosystem, asbestos spread impacts on fisheries, and hazardous material spills.</p> <p>The EPA expressed concern that Traditional Ecological Knowledge has not been included in the environmental review and recommends the supplemental EIS include the identification, inclusion, and integration of Traditional Ecological Knowledge into the NEPA analysis. The EPA also expressed concern about food equity and the impact of the project in a known "food desert." The EPA refers to EJSscreen data and the high nutritional and cultural value of subsistence food within Alaska and recommends analyzing the potential impacts of the proposed project and its reasonably foreseeable actions to the regional subsistence practices and economies. The EPA makes several recommendations for analyzing project impacts, including an approach to determining subsistence impacts, the importance of cumulative impact analysis, consultation needs, toxic hazard evaluation, water pollution and air quality analysis, mitigation and protection measures, and monitoring.</p> <p>Several commenters estimated that a person could lose approximately \$10,000 per year in subsistence food as a result of the project.</p> <p>One commenter stated that access for elderly and disabled subsistence hunters should be incorporated into the supplemental EIS.</p>

Comment Category	Summary of Key Points
Transportation and access	<p>Commenters expressed concern that the road would eventually allow public access, which would lead to permanent and widespread impacts from non-industrial traffic, tourism, all-terrain vehicles, motorboats, airstrips, and external hunting and fishing pressure to wildlands, wildlife, and local traditional subsistence uses. Commenters noted that increased access due to roads could compound user conflict and trespass issues. Commenters noted the supplemental EIS should acknowledge the likely impacts of increased access and future mine developments, and therefore provide a reasonable assessment of direct, indirect, and cumulative impacts, both short term and long term, of this road.</p> <p>Other commenters believed the road should be open to the public to be used for recreation, hunting, and fishing. Some commenters requested the road be open to elderly and disabled locals and their needs. One commenter wanted to see an analysis of hunting regulations in relation to road access restrictions.</p> <p>Commenters stated that the supplemental EIS should provide adequate design and cost information about the road in order to conduct a thorough analysis of the impacts. Commenters stated the supplemental EIS should also have clearer information on how many truck trips per day are anticipated for the road, whether there would be any limitations or changes over time to the number of truck trips per day, and whether trip estimates are one-way or round-trip. Commenters noted the supplemental EIS should address additional traffic burden from road use on existing roads and communities. Commenters noted the maintenance for the road should be addressed because roads in this region erode seasonally and have to be repaired, creating more activity in this wilderness area. There should be more clarification on the permit system and rules for road access. One commenter stated that the BLM underestimated the infrastructure necessary for this road, saying there would also need to be 41 gravel mines for road construction, processing facilities, tailings disposal areas, ore/export terminals, gas stations, and ports.</p>
Visual resources	<p>Commenters expressed concern that the road would impair the area's wild character and scenery due to visual impacts such as road dust, vehicle lights during darkness, and sights of the road from numerous points in the wilderness. Commenters expressed concern that the development would desecrate the landscape and change the face of the region.</p>

3 LITERATURE CITED

Bureau of Land Management (BLM). 2008. *National Environmental Policy Act Handbook H-1790-1. Handbook*. Washington, D.C.: U.S. Department of the Interior, Bureau of Land Management.

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