Section 5
Ambler Mining District Industrial Access Project
U.S. Army Corps of Engineers 404 Permit Application

POA-2013-396

Prepared on behalf of:

Alaska Industrial Development and Export Authority
813 West Northern Lights Boulevard
Anchorage, Alaska 99503

Prepared by:

DOWL
4041 B Street
Anchorage, Alaska 99503
(907) 562-2000

June 2016

1. A complete description of the proposed activity including drawing, sketches, or plans sufficient for public notice (detailed engineering plans and specifications are not required). Please note that all activities the applicant plans to undertake that are reasonably related to the same project and for which a DA permit would be required should be included in the same permit application. Both plan and section (elevation) drawings are required, as is a vicinity map. The drawings should show general and specific site locations, fill and structure dimensions, and the character of all proposed activities. All plans must be submitted in black and white on 8.5" x 11" paper. While professional illustrations are not required, all drawings must be clear, accurate, and contain all necessary information.

The Alaska Industrial Development and Export Authority (AIDEA) is proposing to construct a controlled-access industrial access road located along the southern base of the Brooks Range to the Ambler Mining District in Interior Alaska. The proposed Ambler Mining District Industrial Access Project (AMDIAP) project would design, construct, and operate a controlled-access industrial transportation corridor from the Ambler Mining District to the Dalton Highway. The proposed Brooks East Corridor has been identified as the most feasible alignment for surface transportation access to the Ambler Mining District.

The project would construct a new 211-mile-long gravel surfaced roadway along the southern flanks of the Brooks Range, extending west from the Dalton Highway near milepost (MP) 161 to the south bank of the Ambler River (Figure 1 – Appendix 5-A). The road would provide year round surface transportation access to the Ambler Mining District to allow for expanded exploration, mine development, and mine operations at mineral prospects throughout the area. Access to the road would be controlled and primarily limited to mining-related industrial uses, although some commercial uses may be allowed under a permit process.

The industrial access road at full buildout would have two 12-foot-wide lanes. There would be 20 turnouts located along the road to allow for trucks to pull over. The embankment depth and slope will vary based on soil conditions as discussed further in Section 4 of this USACE permit application narrative. The maximum width of the roadway footprint would typically be 80 feet, but in a few areas terrain and river crossing conditions may result in a wider footprint up to a maximum of 455 feet in one area.

The AMDIAR project includes construction of the road, bridges, culverts, material sites, maintenance stations, landing strips, and access roads to connect to material sites and water sources. Table 1 and Appendix 5A: Figure 5-2 present a summary of major project elements and estimated quantities to be included in construction of the potential roadway project. Complete project drawings (Vicinity Map, Plan View, and Typical Sections) are included with this permit application and can be found in Appendices 5B and 5C.

Culvert locations and sizes are shown in Appendix 5-B. The minimum number of culverts installed at any stream crossing would be one. The maximum number of culverts at one stream crossing would be two culverts in areas noted for moderate or major culverts and three culverts in areas noted for minor culverts.

Maintenance areas would be sited in areas developed for material sites. Airstrips for access to maintenance sites would be sited at maintenance areas developed in material site boundaries.

Table 1: Summary of Major Project Elements

Project Element	Description	Quantity	Typical Size/ Dimensions	Maximum Size/Dimensions
Industrial Access Road Lanes	Industrial Access Road Travel Lanes	211 miles	32 ft wide	32 ft wide
Industrial Access Road Embankment	Two-lane Gravel-Surfaced Road with Full-Depth Embankment	211 miles	80 ft wide	455 ft wide large
Vehicle Turnouts	Gravel-Surfaced Turnouts	20	20 ft wide x 250 ft long	20 ft wide x 250 ft long
Material Sites	Borrow Locations	41[1]	Varies	142 acres
Access Roads Lanes	Travel Lanes for Access Roads	48	32 ft wide x varied lengths	32 ft wide x 450 ft long
Access Road Embankments	Access Road with Embankment	48	80 ft wide x varied lengths	350 ft wide x 450 ft long
Bridges	Water Crossings Greater than 20 ft wide	29	23 ft wide x varied lengths	23 ft wide x 820 ft long
Minor Culverts	Water Crossings Up to 3 ft wide	2,869	Varied Lengths	3 ft diameter x 300 ft long
Moderate Culverts	Water Crossings 4 to 10 ft wide	15	Varied Lengths	10 ft diameter x 166 ft long
Major Culverts	Water Crossings 10 to 20 ft wide	19	Varied Lengths	20 ft diameter x 147 ft long
Maintenance Stations[2]	Material and Crew Facilities	3	12 Acres	20 Acres
Air Strip[2]	Landing Surface	3	150 ft wide x 3,000 ft long	150 ft wide x 3,000 ft long
Air Strip[2]	Airstrip Footprint	3	550 ft wide x 6,400 ft long	550 ft wide x 6,400 ft long

[1]This is a conservatively large number for preliminary design level analysis. [2]These facilities would be co-located with material sites.

AIDEA would hold the ROW granted and own the road, but may procure road design, construction, maintenance and operation services through third-parties. This is a proven AIDEA business model and was successfully used to construct the Delong Mountain Transportation System (DMTS) which provides access to the Red Dog Mine in northwest Alaska. AIDEA owns the DMTS but it was constructed and is operated and maintained by private parties under contract to AIDEA.

AIDEA is not proposing to install fiber optic cables as part of this project; however, AIDEA believes that communications companies may be interested in installing communications cables in the future and that this should be considered as a reasonably foreseeable project in the environmental review process.

The roadway corridor is anticipated to be in operation for a minimum of 50 years. The life span of the roadway corridor is dependent upon the success of exploration and extraction efforts within the Ambler Mining District.

2. The location of the activity, including a legal description.

The project corridor consists of a 211-mile-long alignment, beginning at approximately 67.162° north latitude and 157.052° west longitude, near the Ambler River, and ends at approximately 67.081° north and 150.345° west, near MP 161 of the Dalton Highway (Appendix 5A: Figure 5-1).

The project corridor extends along the south side of the Brooks Range, following a series of stream and river valleys oriented roughly east-west, separating the Schwatka Mountains of the Brooks Range from a series of smaller mountain ranges and foothills, including the Ninemile Hills, Jack White Range, Alatna Hills, Helpmejack Hills, Akoliakruich Hills, Angayucham Mountains, and Cosmos Hills.

A complete list of townships, ranges, and sections crossed by the corridor is provided in Table 2.

3. The purpose and need for the proposed activity.

AIDEA is proposing this project to increase job opportunities and encourage the economic growth of the state. Specifically, the purpose of this project is to support mineral resource exploration and development in the Ambler Mining District in northwest Alaska.

Although AIDEA was established in 1967, the findings leading to the establishment of AIDEA are still true today. AIDEA was established by the State of Alaska to increase job opportunities and encourage the economic growth of the state, and specifically to support development of natural resources. In establishing AIDEA, the State found there were areas of the state with high unemployment rates and that unemployment poses a risk to the health, safety, and general welfare of state residents. The statutes note the state lacks key facilities necessary to permit adequate development of its natural resources to support the balanced growth of its economy, and the expansion of export trade is vital to the health and growth of the state economy.

Natural resource development is a critical component of the Alaska economy, with the minerals industry accounting for over $4 billion of activity in 2012 (Bloomberg BNA, 2014). In 2013, mining provided 9,100 direct and indirect jobs in Alaska. Mining employs residents of more than 80 communities throughout the state and mining wages are some of the highest in the state. State revenues from mining were almost $150 million, including royalties, rents, taxes, and payments to state entities such as the Alaska Railroad.

Table 2: Townships, Ranges, and Sections Crossed by the Proposed Project Corridor[1]

Meridian	Township	Range	Section(s)
Fairbanks	025N	014W	06
		015W	01, 06, 07, 08, 09, 10, 11, 12
		016W	01, 02, 03, 04
		020W	01, 02, 03, 04, 05, 06
		021W	01, 02, 03
	026N	013W	14, 15, 20, 21, 22, 29, 30
		014W	25, 26, 27, 28, 29, 31, 32
		016W	19, 30, 31, 32, 33
		017W	22, 23, 24, 27, 28, 29, 31, 32
		018W	25, 27, 31, 32, 33, 35, 36
		019W	31, 32, 33, 34, 35, 36
		020W	36
		021W	27, 28, 29, 30, 31, 34
		022W	18, 19, 20, 21, 28, 29, 33, 34, 35, 36
		023W	07, 08, 09, 10, 13, 14, 15
		024W	03, 04, 05, 07, 08, 10, 11, 12, 16, 17, 20, 21
		025W	11, 12
Kateel	019N	010E	05, 06, 08, 09, 16, 17, 21, 22, 24, 25, 26, 27, 28, 33
		011E	13, 14, 19, 20, 23, 24, 26, 27, 28, 29, 35
		012E	07, 08, 09, 10, 11, 13, 14, 18
		013E	18, 19, 20, 25, 26, 27, 28, 29, 32
		014E	13, 23, 24, 26, 27, 28, 29, 30
		015E	18, 19, 20, 21, 27, 28, 29, 34, 35, 36
		016E	25, 26, 27, 28, 29, 31, 32, 34, 35
		017E	20, 21, 22, 23, 25, 26, 28, 29, 30
		018E	13, 14, 15, 19, 20, 21, 22, 23, 24, 30
		019E	19, 20, 21, 22, 25, 26, 27
		020E	25, 26, 27, 28, 29, 30, 34, 35
		021E	13, 14, 21, 22, 23, 28, 29, 30
		022E	13, 18, 19, 20, 21, 22, 23, 24
		023E	08, 09, 10, 11, 12, 17, 18
		024E	07, 08, 09, 11, 12, 13, 14, 15, 16
		025E	01, 02, 03, 07, 08, 09, 10
		026E	01, 02, 03, 04, 05, 09, 10
	020N	008E	02, 11, 12, 13
		009E	17, 18, 19, 20, 26, 27, 28, 29, 35, 36
		010E	31
		025E	36
		026E	31, 32, 36
		027E	30, 31

[1]*These sections are crossed by the corridor or contain an identified potential material site.*

As important as mining is currently, it has the potential to become even more critical to the state economy in the future. Alaska has enormous potential for natural resource development. The state currently ranks fifth in the country in terms of mineral production value. But Alaska is still relatively underexplored and underdeveloped. Alaska's mineral resource potential is typically listed in the top 10 mining jurisdictions worldwide based on its mineral resource potential (Fraser Institute, 2013). However, when it comes to infrastructure, Alaska slips to the lowest ranking in the country and falls well below all other developed countries (Fraser Institute, 2013). As pointed out repeatedly by the Alaska Minerals Commission in their annual reports, infrastructure is vitally important to supporting growth in the mining industry in remote areas of Alaska (Alaska Minerals Commission, 2013). Mineral site development in these remote areas, where living costs are very high and economic development opportunities are lacking, provides opportunities for workforce training and development and employment.

The Ambler Mining District in northwest Alaska is one of the areas of highest mineral potential in Alaska. This area has been explored for decades, but the lack of transportation access has made it challenging to bring these high value resource areas into production. The importance of transportation access has been recognized not just by the state but by Congress in the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA Section 201 states:

> *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 purpose of this project is to provide transportation access to the Ambler Mining District to support and encourage mineral exploration and development in this highly mineralized area. As described above, mining is a major industry in Alaska and has the potential to continue its strong growth in employment, wages, and income to the State, local governments, and Native Corporations.

As stated by the Alaska Department of Labor and Workforce Development in the May 2013 Alaska Economic Trends publication (Abrahamson, 2013):

> *"Alaska's mining industry has been a standout over the last decade for its job and wage growth…"*

The public benefits from the project would include:

- Direct employment and wages related to road construction and operation and maintenance activities;
- Indirect employment and wages related to mineral exploration and development in the Ambler Mining District,
- Revenues to local and State government from mineral exploration and development in the District;
- Revenues to Alaska Native Corporations and their shareholders from mineral exploration and development in the District; and

- Opportunities for rural residents to continue to live in their communities while having opportunities to generate income and to possibly create new economic opportunities based on proximity to road access.

Employment in the mining industry has more than doubled over the last ten years. Mining has high average wages and allows workers to live where they prefer and commute to the work site on a rotating schedule. This is especially important for residents of small, rural communities that have few local employment opportunities.

In addition to the employment and wages generated, mining in Alaska paid $17 million to local governments through taxes or payments in lieu of taxes; $150 million to the State through rents, royalties, fees and taxes; and $144 million in payments to Alaska Native corporations.

The operation of Red Dog Mine in northwest Alaska provides insight into the importance of mining in rural Alaska areas. Red Dog has provided over $1 billion to NANA Regional Corporation (NANA) over its life and it is the largest source of revenue for the Northwest Arctic Borough. The revenues to NANA and the borough are spread throughout the region and the State as NANA revenues are shared with other Native corporations and NANA and borough revenues are used to support social services throughout the borough.

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. Alternatively, local residents could instead form their own companies to provide these services. These opportunities have been discussed with residents in the study area and while not a direct benefit of the project, they are indirect and long-lasting benefits to local communities.

4. The schedule of activities, such as the timeframe over which the project would be implemented and the phasing of the project.

Project Phasing

Phase I of the project would construct a single-lane, gravel-surfaced Pioneer Road, approximately 16 feet wide (with two two-foot-wide shoulders) on a shallow embankment, typically 30 to 72 inches deep, depending on subsurface conditions. The embankment would have two horizontal to one vertical (2:1) side slopes. This phase would result in a seasonal road, with restricted access during spring break-up to minimize roadway damage.

Phase II would construct a single-lane, gravel surfaced roadway, approximately 20 feet wide, over the existing Pioneer Road with a full embankment, which would range from 36 to 96 inches deep depending on subsurface conditions. The embankment side slopes would range from two horizontal to one vertical (2:1) to four to one (4:1). This phase would result in year-round access but would likely be operated in one direction at a time with guided convoys of trucks traveling east during certain hours and traveling west during other hours. This phase is anticipated to provide sufficient carrying capacity for several years until the level of mining activity justifies the need for a two-lane road.

Phase III would construct a two-lane, gravel surfaced roadway, typically 32 feet wide, over the existing Phase II footprint. Embankment depth and side slopes would be the same as those in Phase II. The Phase III road would be an all-season roadway designed to support mining exploration, development, and operations, including the hauling of ore loads for export.

Appendix 5A: Figures 5-3 through 5-5 present typical cross sections by phase for comparison. Figure 5-3 illustrates the typical cross section for a seasonal pioneer road. Figure 5-4 represents the typical cross section for a one-lane year-round road. Figure 5-5 represents a typical cross section for a two-lane road.

Construction Schedule

Construction of the proposed project is anticipated to begin in 2019. The Phase I Pioneer Road would be constructed over two years. A winter construction access trail would be established during the first year and the Pioneer Road would be completed in the second year. Construction of the pioneer road would likely take place year round, other than possible restrictions during spring breakup.

Construction of the Phase II single-lane, full-embankment road would take one to two years to complete. The Phase II road is anticipated to be sufficient for mine development and for operations for some number of years. As multiple deposits are explored and new mines brought on line, a two-lane road would eventually be required, The two-lane final buildout road would not be constructed until industrial operations reach a level that would require the expansion. Expansion of the Phase II single-lane, full-embankment road to a Phase III two-lane, full-embankment road would take an additional one to two years to complete.

5. The names and addresses of adjoining property owners.

Table 3 summarizes ownership for properties within one mile of the proposed corridor. Please see the attached list included as Appendix 5-D for a detailed ownership profile.

6. The location and dimensions of all proposed discharge areas and/or structures, and the area of wetlands or other Waters of the United States that would be impacted by the project.

The location of wetland impacts can be seen in the maps presented in Appendix 5-B. A jurisdiction determination was completed on the majority of the corridor. The eastern 50 miles of the proposed corridor ("the eastern portion of the corridor") has changed since the wetland field work was conducted. Consequently, a desktop wetland analysis (Appendix 2G) has been completed for this portion of the corridor, based on guidance in the USACE 1987 Wetland Delineation Manual.

Drawings include plan views and typical sections (Appendix 5C) for the preferred alternative. The typical sections illustrate how the road section may change based on the soil conditions encountered along the corridor. In areas with good soils, a lower embankment can be used, resulting in a smaller footprint. In areas with poor soils, a higher embankment is required, resulting in a larger foot print. Embankment slopes will also vary depending on soil conditions and topography, but will be limited to 2:1 in wetland areas. Slopes in upland areas may be shallower, which has benefits in areas with permafrost.

Drawings in Appendix 5C show daylight limits as well as temporary impact areas which may be affected during construction, including work spaces and clearing areas. Daylight limits are the points at which an area that has been cut or filled matches back to the original ground elevation. The area within the daylight limits is anticipated to be impacted long-term. Work spaces and clearing areas are expected to be impacted for the short-term during construction, but would then be restored after construction.

Table 3: Land Ownership Summary along the Proposed Corridor[1]

Owner	Address
Bureau of Land Management (BLM) District Office	1150 University Avenue Fairbanks, AK 99709
National Park Service (NPS) Fairbanks Headquarters	4175 Geist Road Fairbanks, AK 99709
State of Alaska, Department of Natural Resources Division of Mining, Land & Water Northern Region	3700 Airport Way Fairbanks, AK 99709-4699
State of Alaska Department of Transportation & Public Facilities Northern Region	2301 Peger Road Fairbanks, AK 99709
Northwest Arctic Borough	163 Lagoon Street Kotzebue, 99752
Evansville Incorporated	P.O. Box 60670 Fairbanks, AK 99706
Doyon Limited	1 Doyon Place, Suite 300 Fairbanks, AK 99701-2941
NANA Regional Corporation	P.O. Box 49 Kotzebue, AK 99752
Native Allotments	Bureau of Indian Affairs 101 12th Avenue, Room 166 Fairbanks, AK 99701
Alyeska Pipeline Service Company	P.O. Box 60469 Fairbanks, AK 99706
Alaska Gasline Development Corporation	3201 C Street, Suite 200 Anchorage, AK 99503
GCI Corporation	2550 Denali Street, Suite 1000 Anchorage, AK 99503
AT&T Alaska	505 E. Bluff Drive Anchorage, AK 99501
Andover Mining Corporation	999 West Hasting Street, Suite 890 Vancouver, BC, Canada V6C 2W2
Andover (Alaska) Inc.	c/o J.P. Tangen 1600 A Street, Suite 310 Anchorage, AK 99501-5148

[1]*This list includes land owners within one mile of the proposed corridor.*

Permanent impacts to wetlands and waters of the U.S. for the ultimate road buildout (Phase III, two-lane road) are summarized in Table 4. Permanent impacts are estimated based on wetland fills within the project footprint for the road, access roads, material sites and airstrips. Open water impacts include fills in ponds and riprap within rivers at bridge crossings. Temporary impacts are estimated within 10 feet of the project footprint in wetlands, and for larger areas around bridges and culverts as illustrated in the maps in Section 5: Appendix 5B and the culvert typical sections in Section 5: Appendix 5C. Temporary wetland impacts from construction are summarized in Table 5.

Table 4: Estimated Permanent Wetland and Waters of the U.S. Impacts[1]

Project Element	Permanent Wetland Impacts	Permanent Open Water Impacts[3]	Total Permanent Impacts
	Acres		
Industrial Access Road	1,206.68	0.84	1,207.52
Bridges[2]	0.00	6.0	6.0
Access Roads (Material Sites & Water)	75.87	0.01	75.88
Material Sites & Maintenance Stations	567.28	0.66	567.94
Landing Strips	48.99	0.11	49.10
Total	1,898.82	7.62	1,906.44

[1]Permanent wetland impacts estimated based on daylight limits of project facilities.
[2]Riprap areas at bridge crossings.
[3]Includes fill in ponds and riprap areas at bridge crossings.

Table 5: Estimated Temporary Wetland and Water of the U.S. Impacts[1]

Project Element	Temporary Wetland Impacts	Temporary Open Water Impacts[2]	Total Temporary Impacts
	Acres		
Industrial Access Road	288.37	0.00	288.37
Access Roads (Material Sites & Water)	18.55	0.00	18.55
Material Sites & Maintenance Stations	0.00	0.00	0.00
Landing Strips	0.00	0.00	0.00
Total	306.92	0.00	306.92

[1]Temporary impacts include mechanized clearing areas, work areas, and areas impacted during placement of culverts, bridges, etc. Temporary impacts were estimated using a 10-foot buffer around the alignment and other project elements, and using buffers of various sizes at the various size bridges and culverts. A buffer of 5 feet was used around minor culverts, 10 feet around moderate culverts, and 25 feet around major culverts. Temporary construction areas are shown at each bridge location on the maps in Appendix 5B.
[2]Temporary impacts from clearing and work area disturbance would not occur in water bodies. Other impacts on streams are addressed in Table 6.

Linear stream impacts are summarized in Table 6.

Table 6: Estimated Linear Stream Impacts

Project Element	Permanent Stream Impacts[1]	Temporary Stream Impacts[2]
	Linear Ft	Linear Ft
Industrial Access Road	0	286,619
Access Roads (Material Sites & Water)	0	20,607
Material Sites & Maintenance Stations	71,358	0
Landing Strips	2,021	0
Bridges[3]	3,625	16,889
Total	77,004	324,115

[1]Permanent linear impacts are estimated as the linear feet of rivers and streams impacted by placement of riprap or streams filled or relocated around material sites and/or landing strips.
[2]Temporary linear impacts are associated with areas impacted during placement of culverts. These are measured as the length of the culvert plus an estimated length beyond the culvert for bed and bank disturbance and restoration
[3]Permanent bridge impacts based on linear feet of riprap or wing walls at bridge locations. Temporary stream impacts are based on temporary construction area buffers shown at each bridge location on the maps in Section 5: Appendix 5B.

7. The type and volume of the material to be discharged. Please note that the Corps may also request information on the source of any dredged and/or fill material proposed for use in the project.

Table 7 presents a summary of wetland and Waters of the U.S. fill volumes from construction of the full build-out of a two-lane road (Phase III). Indirect impacts would include clearing along the alignments and other project elements and work areas near bridge abutments. These areas were estimated in acreage based on buffers around bridge abutments. No fill is proposed to be placed in wetlands in these areas and work at bridges would occur on frozen ground. If temporary fills are required for stream diversions or bridge work, these fills would be removed once the culvert or bridge is in place. Estimates for possible temporary fills are included in Table 7.

Table 7: Wetland and Waters of the U.S. Fill Volumes by Project Element[1]

Project Element	Permanent Fill (cubic yards)	Temporary Fill[1] (cubic yards)
Two-Lane Road (Phase III)	8,756,413	N/A
Material Site & Maintenance Stations	N/A	N/A
Access Roads	881,723	N/A
Landing Strips	671,901	N/A
Bridges	26,053	19,100
Culverts	N/A	31,340
Total	**10,333,529**	**50,440**

[1]Road and landing strip fills are in wetland areas. Bridge and culvert fills are in stream and rivers. No temporary fills in ponds are anticipated.

An estimated 12.3 million cubic yards (cy) of fill is anticipated to be needed for project construction, including fill in both uplands and wetlands. Borrow material for embankments would likely be Type C Selected Material, a clean fill material low in organics and frozen matter. It is anticipated structural fill would be made up of Type A or Type B Selected Material and the surface course would be constructed with either D-1 or E-1 Selected Material. Riprap needs are estimated at 101,000 cy. Maintenance needs are estimated at 2 inches of material over the entire road each year for the 50-year road life. A total of 41 potential material sites have been identified along the corridor. These sites have an estimated capacity to provide 10.25 million cy of riprap and 43.23 million cy of gravel.

All fill material would be sourced from material sites located along the project corridor. Areas identified as proposed material sites are noted on Appendix 5A: Figure 5-2 and on the maps in Appendix 5B.

8. A statement describing how impacts to Waters of the U.S. are to be avoided or minimized. The application must also include either a statement describing how impacts are to be compensated for or a statement explaining why compensatory mitigation should not be required for the proposed impacts.

Avoidance

Given the purpose of the project and the prevalence of wetlands throughout the project area, complete avoidance of wetlands and Section 404 resources is not possible. Within the selected corridor, wetlands were avoided when possible. Wetlands were avoided by selecting the shortest route with the least wetland impact, shifting the alignment from the project corridor centerline when possible to avoid wetlands, using the project corridor and material sites for construction staging and work areas, and through the staging of construction.

Minimization

The proposed project corridor was selected, in part, to minimize effects on wetlands. Eight potential access corridors including road and rail options were initially evaluated based on a broad range of design, construction, and environmental criteria (Table 8). Evaluation of these preliminary corridors led to the refinement and selection of a project corridor ("Brooks East Corridor") to be carried forward as the proposed project corridor. Information about the eight preliminary corridors initially considered is compiled in a series of technical memoranda (DOWL HKM, 2011a-2011g) and summarized in the Summary Report (DOWL HKM, 2012 – included in Appendix 2C of this Revised SF299 Consolidated Application).

The Summary Report describes the screening criteria and evaluation of the initial eight corridors identified within the project study area (Appendix 5A: Figure 5-6). Screening criteria used included design criteria, wetlands, hydrology, geotechnical conditions, availability of materials for construction, and other factors. Although two other preliminary corridors had fewer miles through wetland habitats, these routes had more effects on rivers and streams. The selected alternative is believed to have the lowest environment effects overall.

For those surface waters and wetlands that cannot be avoided, the project would lessen its impacts to the greatest extent practicable through innovative design, avoidance of higher valued wetlands, and construction decisions.

Table 8: DOT&PF Reconnaissance Evaluation of Corridors

Criterion	Brooks East[6]	Kanuti Flats	Elliott Highway	Parks Highway RR[4]	DMTS Port[5]	Cape Blossom[5]	Selawik Flats[5]	Cape Darby[5]
Corridor Length (*miles*)	220	240	370	430	260	250	330	340
Federal Conservation System Unit	1[1]	0	0	1	3	1	1	1
Wild and Scenic Rivers	1	0	0	1	1	1	1	1
Salmon/Sheefish River Total	26	55	56	71	76	85	71	77
Mapped Anadromous	5	14	8	8	13	2	23	26
Assumed Anadromous	21	41	48	63	63	83	48	51
Caribou Habitat	Less	Less	Less	Less	More	More	More	More
Threatened or Endangered Species/Critical Habitat	0	0	0	0	3	2	1	3
Wetland Habitats (*miles*)	82	115	88	151	40	144	78	98
Material Site Availability[2]	100%	75%	84%	96%	70%	10%	57%	58%
Total Large Bridges	13	14	12	13	19	22	21	25
Bridges Over 1,500 Feet	0	0	1	1	1	0	0	0
Major Stream Crossings	161	212	251	257	213	221	185	193
Construction Cost[3] (*in millions*)	$430	$510	$990	$1,880	$720	$860	$960	$950
Annual Maintenance Cost (*in millions*)	$8.5	$9.1	$13.5	$17.3	$9.5	$9.2	$12.8	$13.1
Ranking	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Dismissed	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

1. Access through Gates of the Arctic Preserve was specifically authorized in ANILCA.
2. Percent of corridor with material site within 10 miles.
3. Costs rounded to tens of millions. Does not include port construction or expansion costs.
4. Only railroad corridor A, the highest scoring alternative of the four railroad corridors is presented.
5. These alternatives were evaluated for road and rail options. Only road options information is shown, as road options for each ranked higher than rail options due to the high costs of rail.
6. The proposed alignment is based on the Brooks East corridor but has been refined and modified since the reconnaissance evaluation. The currently proposed corridor is 211 miles long.

1. *Design-Based Minimization.*

The following is a summary of surface and subsurface water control methods, which are based on the Preliminary Hydrologic Reconnaissance Memorandum (DOWL HKM, 2011e) and are as follows:

a. Selection of all drainage and stream conveyance structures was based on their ability to replicate natural systems;

b. Bridge design (building to avoid or minimize in-water work);

c. Culverts have been designed to maintain a natural channel within the confines of the structures in order to preserve stream bed characteristics;

d. A rural road section with minimized use of roadside ditches to promote sheet flow of runoff water from the road surface would be used, increasing infiltration and vegetative filtration, thereby minimizing impacts to water quality resulting from concentrated runoff;

e. Fish passage would be provided through the use of embedded stream simulation culverts;

f. Fish passage culvert diameters would be sized to convey peak 100-year flows;

g. Culverts would be sized to reduce maintenance associated with debris clogging and icing, potential glaciation concerns, and sediment deposition;

h. Roadside ditches would be designed to accommodate maintenance demands and snow storage; and

i. All anadromous fish stream crossing would be permitted according to Alaska Department of Fish and Game Title 16 guidelines.

2. *Design-Based Minimization.*

The following is a summary of surface and subsurface water control methods, which are based on the Preliminary Hydrologic Reconnaissance Memorandum (DOWL HKM, 2011e) and are as follows:

a. Selection of all drainage and stream conveyance structures was based on their ability to replicate natural systems;

b. Bridge design (building to avoid or minimize in-water work);

c. Culverts have been designed to maintain a natural channel within the confines of the structures in order to preserve stream bed characteristics;

d. A rural road section with minimized use of roadside ditches to promote sheet flow of runoff water from the road surface would be used, increasing infiltration and vegetative filtration, thereby minimizing impacts to water quality resulting from concentrated runoff;

e. Fish passage would be provided through the use of embedded stream simulation culverts;

f. Fish passage culvert diameters would be sized to convey peak 100-year flows;

g. Culverts would be sized to reduce maintenance associated with debris clogging and icing, potential glaciation concerns, and sediment deposition;

h. Roadside ditches would be designed to accommodate maintenance demands and snow storage; and

i. All anadromous fish stream crossing would be permitted according to Alaska Department of Fish and Game Title 16 guidelines.

3. *Avoidance of Higher Value Wetlands*

Boundaries around each material site have been adjusted to exclude high value wetlands wherever possible. In some areas multiple material sites have been proposed in close proximity to each other. The material site with the lowest wetlands value would be given preference for development if it is shown to contain sufficient gravel deposits during exploratory drilling. Additionally, material sites selected are at least one half-mile from known raptor nests, and material site boundaries maintain at least a fifty-foot distance from lakes and rivers. Most material sites would be operated as dry pits in upland areas. After the resources have been exhausted and the pit is deemed no longer useable, the side walls of the pit would be brought to a two horizontal to one vertical (2:1) slope and vegetated.

Maintenance stations would be constructed at material site locations, where available, to minimize the impacts of their required footprints.

4. *Construction-Based Minimization*

The following is a summary of construction minimization methods based on design drawings at the 20 percent submittal level:

a. The road alignment is designed to cross streams perpendicularly when possible to minimize culvert and bridge length, and reduce stream impacts;

b. Slopes in wetland areas would be constructed at a maximum ratio of two horizontal to one vertical (2:1);

c. Contractor would comply with the General Permit for Stormwater Discharges from Construction Activities, and would:

(1) Prepare a Stormwater Pollution Prevention Plan;

(2) Stake work limits clearly prior to ground disturbance, and protect areas outside the work limits with a four-foot fence;

(3) Not disturb the ground from April 15 to July 15; and

(4) Stabilize road embankment side slopes with an Alaska Native Seed Mix as soon as possible after final grading.

Mitigation

AIDEA anticipates offsetting wetland debits through purchase of wetland credits from an approved in-lieu-fee program (i.e. the Conservation Fund), although additional or alternative mitigation measures may be identified through any environmental analysis process as may be required pursuant to the applicable ANILCA provisions governing this project.

The proposed alignment would impact approximately 1,899 acres of wetlands and 7 acres of other Waters of the U.S. Table 9 presents the number of impacted acres by their functional rating and Table 10 provides the estimated mitigation credits required to compensate for unavoidable impacts to aquatic resources.

Table 9: Estimated Wetland and Waters of the U.S. Impacts and Functional Ratings[1]

Functions & Values Rating	Impacted Acres
High	397
Moderate	684
Low	825
Total	**1,906**

[1]*Wetlands on the eastern end of corridor are allocated to ratings categories at the same ratio as the overall corridor.*

Table 10: Estimated Mitigation Credits Required

Impacted Wetland or Waters of the US	Preservation Ratio	Acres	Estimated Mitigation Credits
Category I (*High*)	3:1	397	1,191
Category II (*Moderate*)	2:1	684	1,368
Category III or IV (*Low*)	1.5:1	825	1,238
	Total	**1,906**	**3,797**

For a thorough explanation of the valuation of wetlands and Waters of the U.S. within the project corridor, see the Preliminary Wetland Delineation Report (DOWL HKM, 2014).

9. A list of authorizations required by other federal, interstate, or local agencies for the work, including approvals received or denials already made.

An Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299) is being submitted concurrently to appropriate Federal agencies with this application submittal. Applications for other reviews and approvals would be coordinated through the environmental analysis process outlined under the applicable ANILCA provisions governing this project.

Table 11 describes regulated activities which may require a permit or approval from federal or state authorities.

Table 11: Summary of Potential Permits, Consultations, or Activities Requiring Review or Approval from Federal and State Agencies

Responsible Agency	Permits, Consultations, and Activities	Authority
State of Alaska Department of Fish and Game	Title 16 Fish Habitat Permit	*Fishway Act: AS 16.05.841 through .861, Fish Passage; Anadromous Fish Act: AS 16.05.871 through .901, Anadromous Fishes*
State of Alaska Department of Natural Resources (DNR)	Temporary Water Use/Water Rights	*AS 46.15; 11 AAC 93*
DNR	Right-of-Way Permit	*AS 38.35.050; AS 38.05.550-565*
DNR	Material Sales Permit	*AS 38.05.810(a)*
All Federal Agencies	Destruction or modifications of wetlands (Wetlands Protection Considerations)	*Executive Order 11990 (Protection of Wetlands) May 24, 1977*
All Federal Agencies	Essential Fish Habitat (EFH)	*Magnuson-Stevens Fishery Conservation and Management Act of 1976*
All Federal Agencies	Actions causing disproportionately high and adverse human health or environmental effects on minority or low-income populations	*Executive Order 12898 (Environmental Justice)*
All Federal Agencies	Actions that cause occupancy and modification of floodplains	*Executive Order 11988: Floodplain Management*
State of Alaska Department of Environmental Conservation (DEC)	Wastewater discharges to waterways via stormwater	*Section 402, Federal Water Pollution Control Act of 1972 (Clean Water Act) (33 USC 1251)*
DEC	State of Alaska 401 Certification	*Pursuant to Section 401 of the Clean Water Act*
DEC	Wastewater discharge into all waters of the state (Wastewater Disposal Permit)	*AS 46.03.020, .100, .110, 18 AAC 15, 70, and 72.010*
United States Department of the Interior (DOI)	Conversion of property purchased or improved with funds from the Land and Water Conservation Fund	*Section 6(f), Land and Water Conservation Fund Act of 1965 (36 CFR 59)*
DOI and official(s) with jurisdiction over the Section 4(f) resource	Development possibly affecting publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites	*Section 4(f) of the Department of Transportation Act of 1966 (49 USC 1653(f))*
DOI and U.S. Fish and Wildlife Services (USFWS)	Actions that could adversely affect threatened and endangered species or their critical habitat	*Endangered Species Act of 1973 (16 USC 1531)*
DOI and USFWS	Actions that could cause takes of protected birds	*Migratory Bird Treaty Act (16 USC 703-711); Bald and Golden Eagle Protection Acts (16 USC 668-668d) and Executive Order 13186*
National Park Service (NPS) and DOI	Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299)	*Alaska National Interest Lands Conservation Act (ANILCA) Section 201*

Responsible Agency	Permits, Consultations, and Activities	Authority
NPS and DOI	Wild and Scenic River Section 7 evaluation	*Wild and Scenic Rivers Act (Public Law 90-542; U.S.C. 12371 et seq.)*
NPS	Wetland Statement of Findings	*NPS Director's Order #77-1*
NPS	Floodplain Statement of Findings	*NPS Director's Order #77-2*
State of Alaska Office of History and Archaeology	Development possibly affecting historic or archaeological sites	*NHPA of 1966, as amended (16 USC 470); As 41.35.010 to .240, Alaska Historic Preservation Act*
Advisory Council on Historic Preservation	Development possibly affecting historical or archaeological sites (Review and Comment)	*National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470)*
U.S. Army Corps of Engineers (USACE)	Discharge of dredged or fill material into U.S. waters, including wetlands (USACE permit)	*Section 404, Federal Water Pollution Control Act of 1972, as amended in 1977 (Clean Water Act) (33 USC 1344)*
USACE	Construction in or over any navigable water, or the excavation or discharge of material into such water, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters	*Section 10 of the Rivers and Harbors Act of 1899*
U.S. Coast Guard	Development of a bridge or causeway over any navigable river or navigable water of the United States	*Section 10 of the Rivers and Harbors Act of 1899, as defined in 33 CFR 329*
Northwest Arctic Borough	Land use permit	*Title 9 of Home Rule Charter of the Northwest Arctic Borough*
Bureau of Land Management (BLM)	Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299)	*ANILCA Title XI*

10. The name, address, and phone number of the applicant. Also include the name address, and phone number of the authorized agent, if applicable.

Applicant
Alaska Industrial Development and Export Authority (AIDEA)
813 West Northern Lights Boulevard
Anchorage, Alaska 99503

Mark Davis, Deputy Director Infrastructure Development
(907) 771-3080
mdavis@aidea.org

Agent
DOWL HKM
4041 B Street
Anchorage, Alaska 99503

Maryellen Tuttell, AICP
(907) 562-2000
mtuttell@dowlhkm.com

11. The application must be signed by the applicant or by a duly authorized agent. When the applicant is represented by an agent, that information will be included in the space provided on the application or by a separate written statement.

The application has been signed accordingly.

The Corps' Project Manager determines if an application is complete, and he/she may request additional information on a case-by-case basis. The nature of the proposed activity can dictate what additional information may be needed for the application:

a. If the activity would involve dredging in navigable Waters of the United States, the application must include: ad description of the type, composition and quantity of the material to be dredged; the method of dredging; and the site and plans for disposal of the dredged material. If dredged material is to be discharged to an upland site, identify the site and the steps that would be taken to prevent runoff from the dredged material back into the water body.

The proposed project includes no dredging activities.

b. If the activity would include the discharge of dredged or fill material into Waters of the United States, or the transportation of dredged material for the purpose of disposing it in ocean waters, the application must include: the source of the material; the purpose of the discharge; a description of the type, composition and quantity of the material; the method of transportation and disposal of the material; and the location of the disposal site.

The project would discharge site source material into Waters of the U.S. (wetland fill) in support of construction of the proposed roadway. The discharged material would be used to construct the roadway foundation (embankment). Please see questions six and seven for additional details regarding locations and quantities of materials to be discharged. All material would be transported on site (within project boundaries) using haul/dump trucks.

No material would be disposed of in ocean waters.

c. If the activity would include the construction of a filled area or pile or float-supported platform, the project description must include the use of, and specific structures to be erected on, the fill or platform.

The proposed roadway includes the construction of 28 bridges used for crossing waterway greater than 20 feet in length. Bridges would be constructed using a combination of solid and pier walls on top of pile driven foundations. Overall bridge lengths vary with the largest individual spans being 140 feet in length. Wingwalls would be constructed as required at the bridge abutments.

d. If the activity would involve the construction of an impoundment structure, the applicant may be required to demonstrate that the structure complies with established state dam safety criteria or that the structure has been designed by qualified persons and, in appropriate cases, independently reviewed (and modified as the review would indicate) by similarly qualified persons. No specific design criteria are to be prescribed, nor is an independent detailed engineering review to be made, by the Corps.

The proposed project would not construct any impoundment structure or facilities.

e. If the activity would involve the construction or placement of an artificial reef, as defined in 33 CFR 322.2(g), in navigable Waters of the United States or in waters overlying the outer continental shelf, the application must include provisions for siting, constructing, monitoring, and managing the artificial reef.

The proposed project would not involve the construction or placement of an artificial reef.

REFERENCES

Abrahamson, Mali. 2013. Alaska's mining industry. *Alaska Economic Trends. Volume 33*, issue number 5, pages 4 – 11. Available at: *http://labor.state.ak.us/trends/may13.pdf*. Alaska Mineral Commission.

Alaska Department of Transportation and Public Facilities. 2004. Standard Specifications for Highway Construction 2004.

Alaska Minerals Commission. 2013. Report of the 2013 Alaska Minerals Commission. Available at: *http://commerce.alaska.gov/dnn/Portals/6/pub/mineralsreport2013.pdf*

Bloomberg BNA. 2014. Incentives Watch: *Economic Development Director Discusses Alaska's Booming Mining Industry and Exploration Tax Credit*. SALT Talk Blog available at *http://www.bna.com/incentives-watch-economic-b17179885869*. March 19, 2014.

DOWL HKM. 2011a. Design Criteria Memorandum, September 2011.

DOWL HKM. 2011b. Corridor Development Memorandum, September 2011.

DOWL HKM. 2011c. Baseline Cost Criteria memorandum. September 2011.

DOWL HKM. 2011d. Geotechnical Memorandum. September 2011.

DOWL HKM. 2011e. Preliminary Hydrology Reconnaissance Memorandum. September 2011.

DOWL HKM. 2011f. Environmental Overview Memorandum. September 2011.

DOWL HKM. 2011g. Draft Field Reconnaissance Memorandum. November 2011.

DOWL HKM. 2012. Ambler Mining District Access, Summary Report, AKSAS 63812. Prepared for the Alaska Department of Transportation and Public Facilities, Fairbanks, AK. May 2012.

DOWL HKM. 2014. Preliminary Wetland Delineation and Functions and Values Assessment. May 2014.

Fraser Institute. 2013. Fraser Institute Annual Survey of Mining Companies 2012/2013. Fraser Institute, Vancouver, British Columbia, Canada.

H.R. 39-96th Congress: Alaska National Interest Lands Conservation Act. 1979. In www.GovTrack.us. Accessed on April 3, 2014, from https://www.govtrack.us/congress/bills/96/hr39.