

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

Division of Mining, Land and Water

Northern Region Land Office,
Fairbanks
(907) 451-2740

Southcentral Region Land Office,
Anchorage
(907) 269-8503

Southeast Region Land Office,
Juneau
(907) 465-3400

The Department of Natural Resources (DNR) Division of Mining, Land and Water (DMLW) manages approximately 100 million acres of uplands and 65 million acres of tidelands, shorelands, and submerged lands on behalf of the public. DMLW is responsible for providing for the appropriate use and management of Alaska's state-owned land and water, in order to provide for maximum use of these resources consistent with the public interest.

Members of the public may research the location of DMLW-managed lands with DNR's online Alaska Mapper at <https://mapper.dnr.alaska.gov>. Activities that the public may engage in on DMLW-managed land without prior approval are referred to as Generally Allowed Uses (GAUs) and are listed under [11 AAC 96.020](#); DMLW may approve activities that exceed these uses with a range of authorizations that vary in degree of revocability and exclusivity. An easement is a grant that guarantees use within the authorized area without undue interruption but usually does not provide for exclusive use. Parties who are interested in obtaining an easement across DMLW-managed land may apply using the attached application form.

DMLW generally grants easements for the following activities:

- **Access infrastructure**, including roads, trails, airstrips and bridges.
- **Utilities**, generally encompassing electrical, telecommunications, water, sewer and natural gas infrastructure.
- **Industrial activities**, including commercial outfall lines and some pipelines.
- **Erosion control features**, including for bank armoring, dikes, jetties, and other revetment structures.

Easements may be granted to governmental entities, corporations, or individuals, and may be limited to private use or open to the public at large. DMLW precedent generally favors the creation of public access easements for access infrastructure. DMLW follows the guidelines for easement width established by [11 AAC 51.015](#) and generally grants utility easements at a 30 foot width and public access easements at a 60 or 100 foot width.

All easement application packages must include the following items in order to be eligible for review:

- Easement Application Form with signature.
- Written Development Plan that describes the proposed development of the easement, and a purpose and need statement for the proposed development. A map or sketch that depicts the location of the proposed development is also required. The Development Plan instructions and form can be found at <https://dnr.alaska.gov/mlw/cdn/pdf/forms/Development-Plan.pdf>.
- Environmental Risk Questionnaire with signature. This form can be found at <https://dnr.alaska.gov/mlw/cdn/pdf/forms/Environmental-Risk-Questionnaire.pdf>.
- Application fee set by [11 AAC 05.070](#) and applicable director's fee order at <https://dnr.alaska.gov/mlw/pdf/DMLWFeeOrder3-v2.pdf>.
- Power of Attorney for a project agent to act on behalf of the applicant, if applicable.

The act of filing an application is not approval for land use. If notified that an application is incomplete, applicants will have 30 days to provide the necessary information. If the applicant is not responsive the

application will be closed. Complete applications will be posted in their entirety to the DMLW public notice webpage for a period of 30 days. Following the close of this notice period DMLW will issue an appealable Regional Manager's Decision (RMD) that will either approve or deny the request. This decision may detail additional steps and/or modify the initial request as a condition of obtaining or holding an easement. Conditions may include, but are not limited to:

- **Survey of the easement boundaries.** A survey of the shoreline may be required prior to undertaking construction activities when working near riparian boundaries. A postconstruction as-built survey of constructed improvements may also be required.
- **Evidence of having applied for or received permission to utilize neighboring lands** or adjoining upland property, if such property is required for the overall project.
- **Dedication of reciprocal easement** over the applicant's land, at DMLW's determination.
- **Use fees** set by [11 AAC 05.070](#) and applicable director's fee order at <https://dnr.alaska.gov/mlw/pdf/DMLWFeeOrder3-v2.pdf>.
- **Performance guaranty** in the form of a cash bond, certificate of deposit or corporate surety bond. The minimum performance guaranty for an easement is \$1,000 per acre or portion of an acre.
- **Proof of insurance** that covers the proposed activities.
- **Submission of an annual report** of activities that occurred within the easement and/or that are proposed to occur within the easement.

Applicants are encouraged to contact the appropriate regional land office listed above and/or apply for an easement a year in advance of their desired construction timeframe. DMLW regional land office contact information is listed at the beginning of this document. Applicants should also expect to retain surveyors or project agents for the full length of proposed construction activities as DMLW holds easements in a conditionally approved status until completion of an as-built survey and/or receipt of required deliverables. Failure to complete conditions of a RMD including the completion of an as-built survey will result in the termination of the authorization, and the applicant will be required to remove any improvements that were installed.

Applicants are encouraged to meet with a member of DMLW's staff to discuss proposed activities prior to filing an application.

Completed Easement Applications must be submitted electronically to an email address below or mailed to one of the following offices closest to the proposed use or activity on state lands:

Northern Region Land Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2740
nro.lands@alaska.gov

Southcentral Region Land Office
550 West 7th Ave, Suite 900C
Anchorage, AK 99501-3577
(907) 269-8503
dnr-pic@alaska.gov

Southeast Region Land Office
P. O. Box 111020
Juneau, AK 99811-1020
(907) 465-3400
sero@alaska.gov

Statewide TTY – 771 for Alaska Relay or 1-800-770-8973

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
Division of Mining, Land and Water

APPLICATION FOR EASEMENT
AS 38.05.850

ADL# _____
(to be filled in by State)

Applications that are submitted with unfilled sections or inadequate explanation and/or without application fees, a location figure and/or a completed Division of Mining, Land and Water (DMLW) Environmental Risk Questionnaire will be deemed incomplete. Incomplete applications will be returned without review. See DMLW's current fee regulations (11 AAC 05) and associated Director's Fee Order for applicable non-refundable fee amounts. The filing of an application does not guarantee processing or approval of the requested authorization.

Applicant: NANA Regional Corporation, Inc. Doing Business As: NANA
Agent: (if applicable; attach record of authorization to represent) Jason Louvier, Project Superintendent
Mailing Address: 906 W 9th Avenue Email: jason.louvier@nana.com
City/State/Zip: Anchorage, AK 99501
Primary Phone: 907-265-4115 Alternate Phone: _____
General Location: Northwest Arctic Borough (NAB) Municipality: _____
Section(s): List in Att 1, Sec. 2.4 Township: _____ Range: _____ Meridian: Kateel River
Section(s): and maps in Att. 2 Township: _____ Range: _____ Meridian: Kateel River

Attach a location figure, plan drawing or survey that shows the detailed location of the requested easement in relation to adjoining property boundaries and reference points. All features must be labeled.

Dimensions requested (Complete line 1 for a lineal easement or line 2 for an easement with an irregular shape):

1. Length: (feet) 54 miles (285,120 ft) Width: (feet) 30

2. Area: 197 Are units in ☐ square feet or ☒ acres? (check one)

Term requested and rationale: 50-year term to match the service life of the fiber optic network

Are you applying for a ☒ public or a ☐ private easement? (check one) Rationale:

The fiber optic infrastructure will serve public needs by providing telecommunications services to NAB communities.

Development plan summary/specific purpose of easement: (e.g., electric utility, fiber-optic cable, road, bridge, airstrip/airport, driveway, trail, drainage). This information will be used to determine the scope of use of the easement.

NANA Regional Corporation, Inc. (NANA) is proposing the design, construction, operation, and maintenance of a high-speed broadband internet network, connecting each of the communities in the Northwest Arctic Borough (NAB) to a fiber optic cable (FOC) system and associated infrastructure. The project will establish over 600 miles of "middle mile" FOC connectivity between the unserved tribal communities of the region to a broadband Point of Presence in Kotzebue. Once installed, this FOC network will provide long-term access to affordable and reliable high-speed internet, providing a critical tool for better emergency communication capabilities, enhanced healthcare services, increased and new economic development, and improved educational opportunities, among other benefits.

ADL # _____

Is this an existing use? ☐ Yes ☒ No. If yes, explain extent and duration of use to date:

Describe plans for initial construction. Be detailed. Include a list of authorizations for portions of the project that are proposed for construction on adjoining lands, other permitting, and/or third-party non-objections: (Use extra sheets as needed)

Please refer to the Plan of Development in Attachment 1 for complete details. In summary, construction on state lands will primarily follow the ground-lay fiber (GLF) methodology, which involves placing the fiber optic cable directly on the tundra during winter months when the ground is frozen and snow-covered. This approach minimizes disturbance to the tundra environment. Construction equipment will include low ground pressure vehicles (LGPVs) designed to operate with minimal impact on the tundra.

The 0.47-inch diameter armored fiber optic cable will be laid with adequate slack (3-5%) in a serpentine pattern to accommodate terrain contours.

At small stream crossings, the cable will be laid across ice with anchors on each bank, allowing it to naturally settle to the streambed during spring thaw. For larger rivers, aerial crossings using wooden poles will be constructed to maintain clearance for boat traffic. At 14 complex crossings, Horizontal Directional Drilling (HDD) will be utilized to bore under the rivers. One HDD crossing is located on State land (Kiwalik River). Near villages, the FOC may be hung aerially on existing utility poles and possibly trenched as it approaches the last pole to protect the cable.

The project has secured funding through the National Telecommunications and Information Administration's Tribal Broadband Connectivity Program. NANA is coordinating with multiple agencies including BLM, USFWS, USACE, ADF&G, NAB and local Native corporation KIC for necessary authorizations on their respective lands.

Anticipated construction timeframe: January 2026-Fall 2026, more details in Attachment 1 (Sections 3.1 and 4.1).

If this authorization is granted, I agree to construct and maintain the authorized improvements in an acceptable manner, and to keep the area in a neat and sanitary condition; to comply with all the laws, rules, and regulations pertaining thereto; and provided further that upon termination of the easement for which application is being made, I agree to remove or relocate the improvements and restore the area without cost to the State and to the satisfaction of DMLW.

Applicant's Signature Jason Louvier Digitally signed by Jason Louvier
Date: 2025.06.25 13:30:41 -08'00'

Date: 06/25/2025

This form must be filled out completely and submitted with the applicable fees. Failure to do so will result in a delay in processing. AS 38.05.035(a) authorizes the director to decide what information is needed to process an application for the sale or use of state land and resources. This information is made a part of the state public land records and becomes public information under AS 40.25.110 and 40.25.120 (unless the information qualifies for confidentiality under AS 38.05.035(a)(8) and confidentiality is requested, AS 43.05.230, or AS 45.48). Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210.

In submitting this form, the applicant certifies that he or she has not changed the original text of the form or any attached documents provided by the Division. In submitting this form, the applicant agrees with the Department to use "electronic" means to conduct "transactions" (as those terms are used in the Uniform Electronic Transactions Act, AS 09.80.010 – AS 09.80.195) that relate to this form and that the Department need not retain the original paper form of this record: the department may retain this record as an electronic record and destroy the original.

For Department Use Only
Application received date stamp

Receipt Types:

- ☐ **13A Pipeline Easement**
☐ **13 Other Easement**

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

Division of Mining, Land and Water

Land Conveyance Section 550 W. 7 th Ave, Suite 640 Anchorage, AK 99501-3576 (907) 269-8594 dnr.noncompland@alaska.gov	Northern Region 3700 Airport Way Fairbanks, AK 99709-4699 (907) 451-2740 nro.lands@alaska.gov	Southcentral Region 550 W. 7 th Ave, Suite 900C Anchorage, AK 99501-3577 (907) 269-8503 dnr.scro@alaska.gov	Southeast Region P. O. Box 111020 Juneau, AK 99811-1020 (907) 465-3400 sero@alaska.gov
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Statewide TTY – 771 for Alaska Relay or 1-800-770-8973

APPLICANT ENVIRONMENTAL RISK QUESTIONNAIRE

The purpose of this questionnaire is to help clarify the types of activities you propose to undertake. The questions are meant to help identify the level of environmental risk that may be associated with the proposed activity. The Division of Mining, Land and Water's evaluation of environmental risk for the proposed activity does not imply that the parcel or the proposed activity is an environmental risk from the presence or use of hazardous substances.

Through this analysis, you may become aware of environmental risks that you did not know about. If so, you may want to consult with an environmental engineer or an attorney.

NANA Regional Corporation, Inc.		NANA	
Applicant's Name		Doing Business As	
909 W 9th Avenue		Anchorage	AK 99501
Address		City	State Zip
	907-265-4115	jason.louvier@nana.com	Jason Louvier
Message Phone	Work Phone	Email	Contact Person

Describe the proposed activity:

The proposed activity is the installation of a FOC network across Alaska state lands to connect communities in the Northwest Arctic Borough to broadband internet service. The project will use primarily ground-lay methods during winter months to minimize environmental impacts.

In the course of your proposed activity will you generate, use, store, transport, dispose of, or otherwise come in contact with toxic and/or hazardous materials, and/or hydrocarbons? ☒ Yes ☐ No. If yes, please list the substances and the associated quantities. Use a separate sheet of paper, if necessary.

List of substances and quantities (sample MSDS in Attachment 4):

- Arctic grade diesel fuel: Up to 5,000 gallons stored in double-walled fuel sleighs for equipment operation
- Lubricating/engine oil: Up to 5 gallons of various lubricants stored within traveling equipment
- Hydraulic fluid: Small amounts stored within traveling equipment
- Antifreeze (ethylene glycol and propylene glycol): Less than 5 gallons secured in appropriate containers
- Batteries: Primarily solid-state batteries in operating equipment

ADL # _____

If the proposed activities involve any storage tanks, either above or below ground, address the following questions for each tank. Please use a separate sheet of paper, if necessary, and, where appropriate, include maps or plats:

a. Where will the tank be located?

Fuel will be stored in double walled tanks that were custom built in Alaska for the specific purpose of this type of winter overland travel. The tanks will be held on fuel sleighs (which offer secondary containment) that will travel alongside mobile camps during construction. Each sleigh holds two each double walled tanks.

b. What will be stored in the tank?

Arctic grade diesel fuel

c. What will be the tank's size in gallons? 2,500 gallons per tank

d. What will the tank be used for? (Commercial or residential purposes?)

To fuel construction equipment and power generators for the small mobile camp. Fuel tank usage will be mobile and temporary.

e. Will the tank be tested for leaks? Yes, tanks will be inspected daily during operation.

f. Will the tank be equipped with leak detection devices? ☐ Yes ☒ No. If yes, describe:

Do you know or have any reason to suspect that the site may have been previously contaminated? ☐ Yes ☒ No.

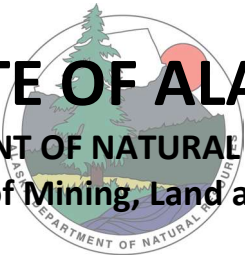
If yes, please explain:

The ADEC Contaminated Sites database was searched for any sites near the proposed easement corridor. No sites are closer than 2 miles from the requested easement area.

I certify that due diligence has been exercised and proper inquiries made in completing this questionnaire, and that the foregoing is true and correct to the best of my knowledge.

Applicant Signature: **Jason Louvier** Digitally signed by Jason Louvier
Date: 2025.06.25 13:31:00 -08'00' Date: 06/25/2025

AS 38.05.035(a) authorizes the director to decide what information is needed to process an application for the sale or use of state land and resources. This information is made a part of the state public land records and becomes public information under AS 40.25.110 and 40.25.120, unless the information qualifies for confidentiality under AS 38.05.035(a)(8) and confidentiality is requested, or qualifies for confidentiality AS 43.05.230, AS 45.48, or other state or federal laws. Public information is open to inspection by you or any member of the public. A person who is the subject of the personal information may challenge its accuracy or completeness under AS 40.25.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210. In submitting this form, the applicant agrees with the Department to use "electronic" means to conduct "transactions" (as those terms are used in the Uniform Electronic Transactions Act, AS 09.80.010 – AS 09.80.195) that relate to this form and that the Department need not retain the original paper form of this record: the Department may retain this record as an electronic record and destroy the original.



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P. O. Box 111020
Juneau, AK 99811-1020
(907) 465-3400
sero@alaska.gov

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INSTRUCTIONS FOR COMPLETING A DEVELOPMENT PLAN

A development plan is a written statement (narrative) and a sketch or blueline drawing describing the proposed use and development of state land. The information contained in a development plan is needed to provide a complete review of the application and the proposed use and development, and helps to determine the terms and conditions of the authorization and the level of bonding and insurance that may be required.

Most applications submitted to the Division of Mining, Land and Water must have an attached development plan. The few exceptions to this rule include applications for state land sales and some types of land use permit. The amount and type of information included in the development plan will depend on the proposed use and level of development. Insufficient information in the development plan and/or application or failure to provide a development plan may result in a delay in processing the application. If you are unsure whether your application will require a development plan, contact the regional office responsible for managing the area you are planning to use (regional office addresses and phone numbers are shown at the top of this sheet).

If the application is approved, the approved development plan becomes a part of the authorization document. Authorized activities are limited to those described in the development plan and/or authorization document. The development plan must be updated if changes to an approved project are proposed before or during the project's siting, construction, or operation; if any additional structures, buildings, or improvements are proposed; or if there is a change in activity that was not addressed during consideration of the application. Please note that these development plans or plan changes must be approved by the Division of Mining, Land and Water before any change occurs in use, construction, or activity. Conducting activities that are not authorized by the development plan and authorization document could result in revocation and termination of the authorization and/or other appropriate legal action.

- I. **General Guidelines for Preparing a Development Plan** For new authorizations, the development plan must show the proposed improvements and/or use areas, as well as preconstruction plans. For existing authorizations without a current development plan or if the development plan is being updated, the plan must show existing improvements and/or use areas, etc., and any known future changes. The development plan must include:
 - **Maps:** a USGS map at a scale of at least 1:63,360 showing the location of the proposed project; a blueline drawing or sketch, drawn to scale (the attached diagram may be used); and
 - **Written Project description:** a detailed written description (narrative) of the intended use and level of development planned under the authorization and an explanation of the sketch or blueline drawing.

- II. **Land Use Permits** Permanent improvements cannot be authorized by a land use permit. However, a development plan accompanying a land use permit application must describe nonpermanent structures and activities. (Nonpermanent structures are structures that can be easily and quickly taken down and removed from the site, without any significant disturbance or damage to the area.) Several of the specific development plan items listed below will not apply to activities authorized under a land use permit; those items that do apply should be described in as much detail as possible, to enable prompt review of the application. If the proposed land use permit activity is of a mobile nature, such as a permit to move heavy equipment across state land, a development plan is not required; but a map showing the proposed route of travel is required. If the impact would not have a significant effect on the environment, such as a permit to harvest wild produce, a development plan is not required, but a map showing the location of the proposed harvest area is required.
- III. **Narrative portion of the development plan** Describe the type of activities or development planned for the site; specify if any facilities are intended for commercial use, or will be rented out; and provide a description and explanation of the items shown on the sketch or blueline. Following is a list of specific information to be included in the narrative, if applicable to the proposed project:
- **Legal description.** Provide a legal description of the parcel, i.e. a metes and bounds description, survey, lot and block, aliquot part, or other legal description.
 - **Terrain/ground cover.** Describe the existing terrain/ground cover, and proposed changes to the terrain/ground cover.
 - **Access.** Describe existing and planned access, and mode of transportation. If public access is to be restricted, define possible alternative public access routes.
 - **Buildings and other structures.** Describe each building or structure, whether permanent or temporary, including a description of the foundation as well as the building and floor construction; the date when the structure is to be constructed or placed on the parcel; the duration of use; and what activities are to occur within each structure.
 - **Power source.** Describe type and availability of power source to the site.
 - **Waste types, waste sources, and disposal methods.** List the types of waste that will be generated on-site, including solid waste, the source, and method of disposal.
 - **Hazardous substances.** Describe the types and volumes of hazardous substances present or proposed, the specific storage location, and spill plan and spill prevention methods. Describe any containment structure(s) and volume of containment structure(s), the type of lining material, and configuration of the containment structure. Provide Material Safety Data Sheets (MSDS).
 - **Water supply.** Describe the water supply and wastewater disposal method.
 - **Parking areas and storage areas.** Describe long-term and short-term parking and storage areas, and any measures that will be taken to minimize drips or spills from leaking vehicles or equipment. Describe the items to be stored in the storage areas.
 - **Number of people using the site.** State the number of people employed and working on the parcel, and describe the supervisor/staff ratio. Estimate the number of clients that will be using the site.
 - **Maintenance and operations.** Describe the long-term requirements, how they will occur and who will perform the work. Specify if any subcontractors will be involved, and explain the tasks they will perform.
 - **Closure/reclamation plan.** Provide a closure/reclamation plan, if required for the type of authorization being applied for, e.g. material sale.
- IV. **Sketch or blueline portion of the development plan** The sketch or blueline must be drawn to scale, and each item labeled in such a way that the information contained in the drawing can be located in the narrative portion of the development plan (professional quality drafting and mechanical lettering is preferred). Following is a list of information to be shown on the drawing, if applicable:

- Section, Township, and Range lines; North arrow; scale; title; and legend (attached is an acceptable format).
- All property boundaries, ordinary or mean high water lines, and existing or proposed rights-of-way; major topographic features such as roads, streams, rivers, and lakes, and their geographic names.
- Location and dimensions of any gravel pads, or cement foundations, buildings, and other structures and improvements, appropriately labeled.
- Location of any buried or above-ground utility lines (power, water, fuel, natural gas, etc.); sewage facilities, including sewage and wastewater outfall point; underground water system; and water source (if any).
- Location where any hazardous substances, including but not limited to oil, lubricants, fuel oil, gasoline, solvents, and diesel fuel, are stored. Method of storage (tank, drum, etc.).
- Location of parking areas, and areas for the storage of inactive vehicles; snow storage areas; storage areas for any other items not mentioned above (drill rigs, camps, pipe, watercraft, etc.).

Site Development Diagram

		VICINITY MAP			
		Date Prepared:		Applicant's Name:	
		Alaska Department of Natural Resources Division of Mining, Land & Water Land Use Permit			
		Site Development Diagram			
		Sec(s) _____ T _____ R _____ M _____			
		Sheet of		File #	

Attachment 1:

PLAN OF DEVELOPMENT

NANA Region Middle Mile Fiber Optic Project

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1.0 INTRODUCTION

NANA Regional Corporation Inc. (NANA), headquartered in Kotzebue, Alaska, is a for-profit regional Alaska Native Corporation, formed in 1971 as a result of the Alaska Native Claims Settlement Act (ANCSA). NANA is owned by the more than 15,000 Iñupiat shareholders and their descendants, who live in or have roots in Northwest Alaska. The Iñupiat people have close ties to the land and to each other. The word Iñupiat means "real people" in Iñupiaq, the language of the region. The NANA region (Figure 1) is located in Northwest Alaska, largely above the Arctic Circle, and encompasses over 38,000 square miles. NANA has a stated mission to improve the quality of life for the people by maximizing economic growth while protecting and enhancing the lands and promoting healthy communities with decisions, actions, and behaviors inspired by the Iñupiat Iḷitqusiat (traditional values).

1.1 PROJECT PURPOSE AND NEED

NANA has secured funding from the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) through the Tribal Broadband Connectivity Program (TBCP). This project stands as one of the largest infrastructure initiatives undertaken in the region, aiming to provide affordable and reliable high-speed broadband access to thousands of individuals that are currently unserved by NTIA and Federal Communication Commission (FCC) standards. "Unserved" means true broadband with reliable speeds of at least 100/20Mbps (download/upload) are not available. The project holds great promise for the region, offering many positive benefits upon completion, including better emergency communication capabilities, improved access to education, healthcare, and government services. Additionally, achieving broadband internet capabilities for the region will unlock economic opportunities by facilitating e-commerce, remote work, and entrepreneurship.

The primary objective of the NANA Region Middle Mile Fiber Optic Project is to install a dependable, scalable, and future-proof fiber-based broadband network capable of providing affordable high-speed and low latency internet services to the NANA region. The region's current internet service is either nonexistent or slow and unreliable due to the lack of adequate infrastructure and connectivity to the rest of the state and national/global networks.

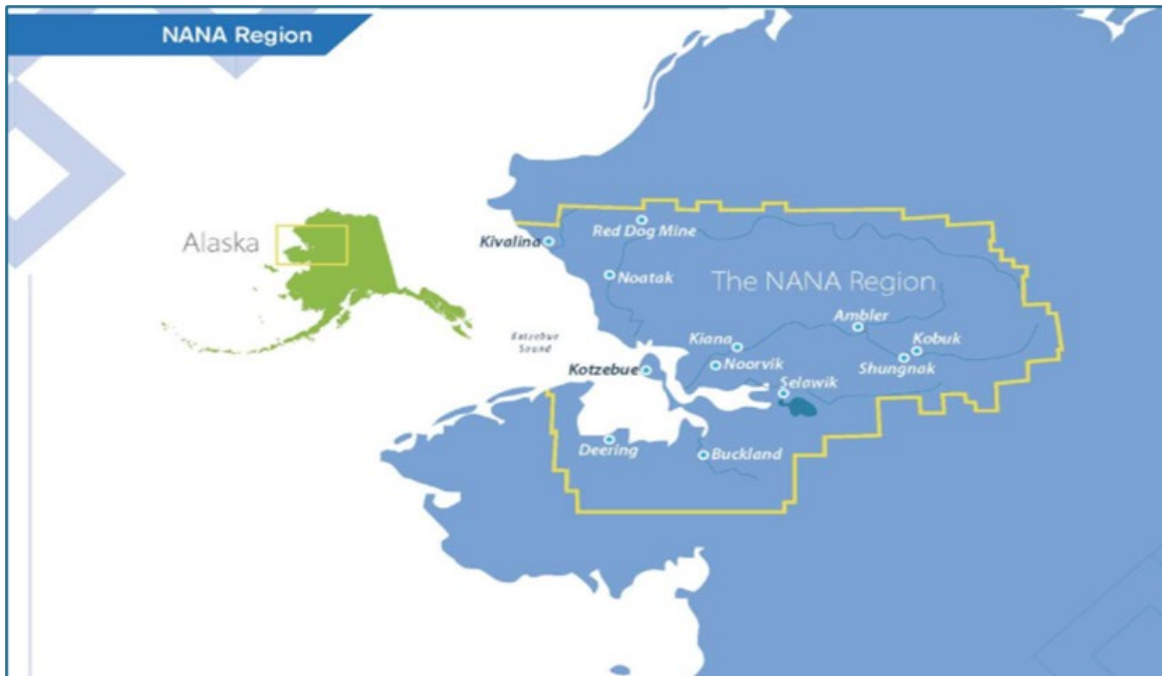


Figure 1: The NANA Region/project area.

1.2 PROPOSED ACTION

The Proposed Action consists of deploying approximately 662 miles of “middle mile” fiber optic cable (FOC) to connect eight Northwest Arctic Borough (NAB) communities in the NANA region. Consistent with the goals established by NTIA’s TBCP, the Arctic Economic Council’s broadband initiative (AEC 2016), and the State of Alaska’s Taskforce on Broadband (2021), the NANA Region Middle Mile Fiber Optic Project will establish the “middle mile” infrastructure to provide a backbone between communities and regional/national/international telecommunications networks (i.e., “first mile” infrastructure). This middle mile infrastructure involves the deployment of long-haul FOC across substantial distances between the communities, connecting to the local distribution points in each village.

The focus of this Plan of Development (POD) is the description of the FOC placement between the remote villages in the NANA region. The proposed construction methodology will use a hybrid system that includes surface-laid terrestrial FOC with strategic marine, aerial, directionally bored, and trenched segments where necessary for system integrity, redundancy, and environmental protection. This approach leverages proven construction methodologies specifically adapted for Arctic tundra conditions. The system will provide the region’s remote villages with the same services currently available to Kotzebue.

1.3 APPLICATION REQUIREMENTS CROSS-REFERENCE LIST

This Easement Application Package does not follow the exact order of requirements listed in ADNR’s easement application instructions (ID 102-DEVPL [Rev. 07/23]). Table 1-1 provides a cross-reference linking this Application’s sections to the relative parts of the ADNR requirements.

Table 1-1: Cross-reference of ADNR requirements and the location within this application package

Attachment	Section Number	ADNR Requirement
2	All maps	Maps: A USGS map at the scale of at least 1:63,360 showing the location of the proposed project
1	Sections 3.3 and 4.2	Maps: a blueprint drawing or sketch, drawn to scale
1	Development Plan	
1	Section 2.4	Legal Description
1	Section 1.4	Terrain/ground cover: Describe the existing terrain/ground cover, and proposed changes.
1	Section 1.4	Access: Describe existing and planned access, and mode of transportation.
1	Section 1.4	Buildings and other structures: Describe each building or structure, whether permanent or temporary, including a description of the foundation as well as the building and floor construction; date when the structure is to be constructed or placed on the parcel; duration of use.
1	Section 1.4	Power source
1	Section 5.1	Waste types, waste sources, disposal methods: list types of waste that will be generated on-site, the source, and method of disposal
1	Section 5.2	Hazardous substances: Describe types and volumes of hazardous substances present or proposed, the specific storage location
1	Section 5.3	Spill plan and prevention methods
4	-	Hazardous substances: Material Safety Data Sheets (MSDS)
1	Section 1.4	Water supply: describe water supply and wastewater disposal method
1	Section 1.4	Parking area and storage areas: describe long-term and short-term parking and storage areas, and any measures that will be taken to minimize drips or spills from leaking vehicles or equipment.
1	Section 1.4	Number of people using the site
1	Section 6.0	Maintenance and operations: describe the long-term requirements, how they will occur and who will perform the work. Specify if any subcontractors will be involved and explain the tasks they will perform.
1	Section 7.0	Closure/reclamation plan: Provide a closure/reclamation plan, if required for the type of authorization being applied for.

1.4 STATE LANDS

The route crosses state lands for approximately 54 miles, which represents approximately 8% of the total project length.

The project route across state lands primarily traverses Arctic tundra and wetland environments, with occasional shrub thickets. The terrain is generally flat to gently sloping, with numerous small

streams and several larger rivers. Vegetation along the proposed route is primarily tundra tussock consisting of sedge grasses, willows (*Salix* sp.), dwarf birch (*Betula nana*), and green alder (*Alnus viridis*). Changes or alterations to the terrain and ground cover will be minimal, as the proposed alignment has been carefully selected to minimize impacts to sensitive areas and avoid heavily forested regions that would require significant vegetation clearing. Project construction will occur during winter months with sufficient snow cover to provide protection for vegetation and the landscape. The ground-lay fiber (GLF) construction methodology is specifically designed to protect the native vegetation and underlying permafrost. The route was designed to avoid vegetation and woodlands to a practicable extent. When unavoidable, clearing of vegetation will be limited to the 30-ft. construction corridor, and, in most areas, only as wide as necessary to support equipment passage, or 15 ft.

The selected 30-ft. ROW width is designed to balance minimizing project impacts while also ensuring adequate space for construction and maintenance activities. The construction deployment trains (Section 3.3.1) utilize equipment up to 12-ft. wide. Additionally, redundant segments of the route, such as the out-and-back section to Kiana (Sections 2.0 and 3.3.4), require collocation of two FOCs within a single corridor. These cables will be installed side by side in a 12-ft. wide serpentine pattern (Section 3.3.4). To accommodate this cable configuration and provide sufficient maintenance crew access, a minimum of 30 feet of space is required. No new permanent access roads, permanent buildings, power sources, or water supply or wastewater systems will be constructed or installed on state lands as part of this project. Public access along the easement corridor will not be restricted. Structures and materials associated with the project on state lands will include the following and are further detailed in Sections 3–4:

1. Fiber Optic Cable: 0.47-inch diameter armored cable designed for extreme climate conditions, consisting of a cable core with 24 strands of optical fiber surrounded by armoring layer and an outer protective sheath.
2. Cable Anchors: Heavy, low-profile anchoring devices with cable grips deployed at splice points, elevation transitions, and at regular intervals of no more than 6,000 ft. to mitigate lateral cable movement and preserve splice integrity.
3. Encased Splice Points: Weatherproof enclosures at approximately 24-mile intervals to protect splice joints where FOCs are interconnected.
4. Temporary Construction Camp: Mobile sleigh camp for crew housing during the winter construction phase, which is transient and will be completely removed following completion of work.

During construction, power will be provided by diesel generators at the mobile camps. The FOC itself is a passive system requiring no power along the route. Potable water will be transported along with the mobile camp and will be refilled from the nearest community water system. Gray water will be properly contained and disposed of at authorized facilities in nearby communities; no direct discharge to the environment will occur.

No long-term parking or storage areas will occur on state lands. Temporary parking and equipment staging areas will be established when necessary while the linear project construction is accomplished. These staging areas will be adjacent to the mobile camp and will be located on top of adequate snow cover to protect the underlying vegetation. While in temporary staging, all vehicles and equipment will be properly maintained to ensure no leaks or damage are present. Drip pans will be appropriately placed beneath engines as a back-up spill prevention measure.

Up to three crews of 12-14 workers per crew will be working along the route at individual project segments (one crew per segment) throughout the winter construction period. After construction is complete, the FOC route will only be accessed occasionally for maintenance, typically by small crews of 2-4 technicians. No permanent staffing will be required along the ROW corridor during operation.

2.0 PROJECT DESCRIPTION

The proposed 662-mile FOC route (Attachment 2, Figure 1) will be comprised of a combination of terrestrial ground-laid, subsea, horizontal directional drilling (HDD), trenched, and aerial cables to connect the remote project villages across vast distances to the broadband Point of Presence (PoP) in Kotzebue. Expanding the fiber optic technology from Kotzebue will provide communities with greatly improved internet services for current applications and anticipated future growth. The increased speeds and lower latency will allow for real-time applications like telemedicine, distance learning, and emergency services that are currently limited or unavailable.

The FOC route is designed to connect to an upstream provider in Kotzebue (see Figure 1 in Attachment 2). The system is strategically designed with redundancy to provide reliable services to the region's remote villages. The redundant bi-directional pathways prevent single points of failure that could isolate multiple communities simultaneously with extended service outages. Loops or rings ensure that if one part of the NANA network fails (e.g., a fiber cut or equipment malfunction), alternative paths can be used to maintain service. Furthermore, maintenance or upgrades can occur on one pathway while traffic flows through an alternative route, avoiding service interruptions. The proposed route maintains full loops throughout the entire FOC network.

The placement of ground lay fiber (GLF) is a proven successful methodology for FOC installation in Arctic Alaska (ASTAC 2024). The cable will be spooled out directly on top of the snowpack overlying the tundra during winter installation by utilizing low ground pressure vehicles (LGPVs) within a proposed 30-ft. right-of-way (ROW) corridor. The 0.47-inch diameter FOC will be placed with enough slack to accommodate the contour of the terrain once the snowpack melts. The cable will naturally settle into the vegetation during spring thaw and eventually become partially embedded into the organic layer over successive freeze-thaw cycles. Strategic, helicopter-supported inspections the following summer will reposition the cable by hand as needed. While the majority of the route will be installed during winter, in-village work and complex waterbody crossings (i.e., Kotzebue Sound, Kobuk River, and Noatak River) will occur in summer.

Major material components include the FOC, vaults or hardened splice cases (to protect splice locations and allow for FOC slack storage), utility poles for aerial waterway or other crossings, and network equipment at each village at the Cable Landing Station (CLS).

2.1 BACKGROUND AND MILESTONES

The initial conceptual plan for the project called for subsea and riverine construction of the entire FOC network. In early 2024, a feasibility study was conducted to evaluate routes and construction methods, with the objective of finding a balanced approach that minimizes potential environmental impacts, enhances critical infrastructure resiliency, and considers the costs associated with effective project implementation and operations. Based on that study, it was determined a primarily ground-lay terrestrial route would offer the most successful and balanced methodology.

In summer and fall 2024, NANA traveled to each village and held community engagement meetings. The proposed project was introduced and discussed, question and answer sessions were held, project maps were reviewed, and community feedback on proposed cable routes and potential adjustments were gathered.

A virtual project introductory meeting was held with most jurisdictional agencies on December 10, 2024. Attendees included the Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), the Alaska Department of Fish and Game (ADF&G), and the Alaska Department of Natural Resources (ADNR). NANA presented a summary of the proposed project and discussed land status through the project corridor, construction methods, and permit requirements. These permit requirements are summarized in Table 1-2 in Section 2.3.

Follow-up individual pre-application meetings were held throughout December 2024–February 2025 with individual agencies, specifically BLM, US Army Corps of Engineers (USACE), USFWS, ADF&G, Kikiktagruk Inupiat Corporation (KIC), and ADNR. The individual meetings allowed for more focused conversations on project details, permit requirements, and timelines. It also allowed NANA to solicit feedback to carry into the final project design.

2.2 ALTERNATIVES

This Project aims to balance the need for minimal environmental impact, resiliency of critical infrastructure, and cost-effective deployment of logistics.

2.2.1 ALTERNATIVE CONSTRUCTION METHODOLOGIES

Underground, aerial, and submersible installation methods were considered for suitability in the environment, sustainability, and longevity feasibility study (New Horizons 2024). Study results affirmed that the most balanced approach to delivering broadband via FOC would be to primarily use the ground-lay method.

Traditional underground FOC installation methods disturb the tundra’s insulating vegetation layer, exposing the permafrost beneath, resulting in a high potential for long-term environmental damage. Permafrost exposure may result in accelerated degradation of the underlying soils creating an increased risk to the FOC and additional costs to the system operator over time.

In-river submarine placement utilizing the region's major rivers poses an increased risk for system damage due to the high potential for ice scour, flooding, channel migration and other damages. Additionally, the FOC network would be more difficult to repair, potentially resulting in extended service outages.

A project using primarily aerial installation would require the installation of thousands of costly new utility poles. Pole installation would be more environmentally damaging and logistically challenging in the Arctic tundra terrain. A primarily aerial/pole-based network would also be highly vulnerable to weather events and challenging to maintain and repair. Although the construction methods presented here do contain some aerial installation at major river crossings, this method is proposed to be implemented on only a very small portion of the overall project.

2.2.2 ALTERNATIVE TECHNOLOGIES

Long-haul microwave and satellite internet networks limit the capability of providing fast and reliable healthcare, government, and educational services to remote Alaska that could otherwise be efficiently delivered by broadband networks (State of Alaska 2021). Microwave and satellite networks cannot meet heavy data demands that could inundate and incapacitate telecommunication services. Economic development would be hindered because businesses in northwest Alaska would be unable to employ the same technologies as their competitors due to the high latency and low bandwidth of these alternative technologies. Additionally, long-haul microwave systems are costly and logistically challenging to maintain, and satellites provide no local control of the system, services, or costs.

2.2.3 ALTERNATIVE ROUTES

NANA evaluated multiple route alternatives throughout the development of this project, incorporating feedback from village visits, agency meetings, and technical feasibility studies. A multifaceted route analysis for GLF suitability is quantified for route options in a thorough Alternatives Analysis that will be provided in the forthcoming Environmental Assessment. All routes maintain connection to the communities while differing in their specific alignments.

- *Alternative 1, Initial Route:* the first route was developed based on the project feasibility study (shown as black in Figure 2). The route connects the region's villages to Kotzebue; specific segments include:
 - A northern corridor to Noatak and Kivalina
 - A southern corridor to Deering and Buckland
 - A central corridor to Kiana through Noorvik
 - A loop through Selawik via spurs branching from the Deering/Buckland and Kiana/Noorvik corridors
 - A large loop from Selawik to the Upper Kobuk communities (Ambler, Kobuk, and Shungnak)

- Advantages: highest level of network redundancy for fiber optic system reliability
- Disadvantages: increased potential of environmental impacts with increased ROW corridor acreage
- *Alternative 2, Kobuk Valley National Park (NP) Route:* this alternative (shown in white in Figure 2) substantially reduces the use of Selawik National Wildlife Refuge (NWR) lands by routing through National Park Service (NPS) lands north of the Kobuk River. This route is evaluated at the specific request of the U.S. Fish and Wildlife Service (USFWS). Subsequent communications from NPS in May 2025 have confirmed their preference for avoiding this route.
 - Advantages: minimizes potential impact in Selawik NWR
 - Disadvantages: more forested land that would require vegetation clearing (twice as much as proposed route), steeper terrain is challenging for ground-lay methodology (average slope in the park is 15 times steeper than through the refuge), longest length of FOC is required (33 and 45 miles longer than proposed and initial routes, respectively)
- *Proposed Route:* the preferred route (shown in red in Figure 2) represents an optimized alignment that balances environmental impact minimization with network reliability. It closely resembles the initial route but features a single corridor through most of the Selawik NWR to connect Selawik to the Upper Kobuk communities, with a smaller loop at the eastern end of this segment to connect Ambler, Kobuk, and Shungnak.
 - Advantages: sufficient network redundancy; the featureless, lowland terrain with minimal topographic variation and fewer obstacles is preferential for ground-lay construction methods; lowest acreage of woodlands; fewer waterbody crossings than initial route
 - Disadvantages: less network redundancy than the initial route

The alternative analysis clearly identifies the proposed route as the most balanced approach, offering significant advantages across all evaluation criteria. While the initial route provides slightly greater redundancy, its expanded footprint increases potential environmental impacts and regulatory challenges. The Upper Kobuk NP route, while reducing impacts to the Selawik NWR, introduces unacceptable compromises in network reliability and construction feasibility. The proposed route is the only viable option that satisfies all project requirements while minimizing potential environmental impacts and ensuring long-term system reliability.

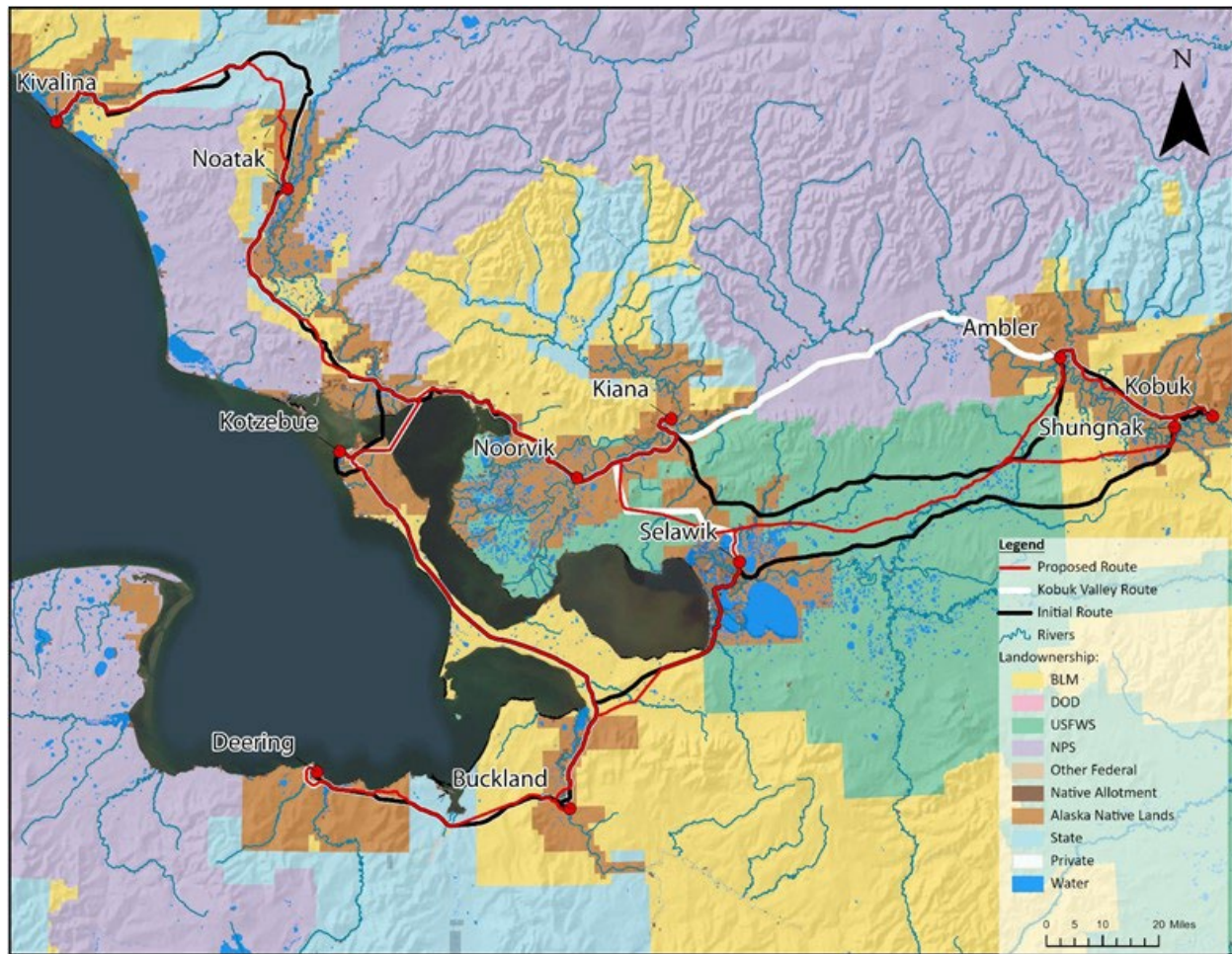


Figure 2. Map of three alternative routes.

2.3 PERMITTING PROCESS

A key schedule driver for the project's construction is the acquisition of required permits and land access agreements. The project team has reviewed existing databases and studies for information related to land ownership, protected resources in the project corridor, cultural and subsistence activities, and other potential environmental constraints. Table 1-2 summarizes the anticipated permits and authorizations for the proposed FOC project.

Table 1-2: Permit Requirements.

Agency	Permit/ Authorization	Regulated Activity	Status
Federal			
BLM	ROW easement	Construction on BLM lands	Submitted
USFWS	ROW easement	Construction on USFWS land	Submitted
USACE	Section 404 Permit	Construction/fill in wetlands	In progress
NOAA	NMFS EFH Assessment	EFH consultation	Application/consultation in progress
State			
ADNR DMLW/ Northern Region	ROW easement	Construction on state land	[This application]
ADF&G	Title 16 Fish Habitat Permit	Crossing of state waters	In progress
ADNR OHA/SHPO	Section 106 Consultation	Compliance with NHPA	Application/consultation to be started
Local			
KIC	Land Access/ROW Authorization	Construction on KIC lands	Submitted
NAB	Title 9 Permit	Development within the Borough	In progress
NANA	Land Use Permit	Construction on NANA lands	In progress

Previously undefined acronyms in table: National Oceanic and Atmospheric Administration (NOAA); National Marine Fisheries Service (NMFS); Essential Fish Habitat (EFH); Division of Mining, Land, and Water (DMLW); Office of History and Archaeology (OHA); State Historic Preservation Office (SHPO); National Historic Preservation Act (NHPA).

2.4 LAND USE

The proposed FOC route traverses lands owned by several entities including the BLM, USFWS (Selawik NWR), State of Alaska (State), NANA, and KIC (Attachment 2, Figure 2). While the proposed route is shown on the Attachment 2 maps, the final 30-ft. ROW will be finalized during construction to optimize alignment and minimize impacts.

The FOC ROW crosses 70 parcels of state lands, all of which are within the Kateel Meridian. Table 1-3 lists the Townships, Ranges, and Sections that the project crosses.

Table 1-3: State land parcel information used by proposed project. All parcels are within the Kateel Meridian.

Township (N)	Range	Section(s)
6	15 W	1-4, 6-9
6	16W	1
7	15W	36
7	16W	19-20, 27-29, 34-36
17	9E	3
22	19W	30
22	20W	5, 9, 15-16, 23, 25-26
24	20W	16, 29
28	19W	6-8, 17, 20, 29, 32
28	20W	1-3
28	21W	6
28	22W	1-2, 9-11, 16-19
28	23W	20-24, 29-31
29	20W	21, 26-30, 35-36
29	21W	25-26, 33-35

2.5 FISH AND WILDLIFE

This project will require compliance with the National Environmental Policy Act (NEPA); the NEPA analysis will detail the project's potential effects on wildlife. This section is a summary of some of the designed mitigation measures currently identified.

The proposed alignment crosses anadromous fish streams and essential fish habitat (EFH), but the project will be designed to minimize any incidental impacts on fish species. Construction methods preferentially design stream crossings to include no streambank impacts (Section 3.3.5), but project integrity requires some bank work at certain crossings to minimize risk to FOC damage (Section 3.3.5.2 and Section 4.2). Construction and maintenance activities that have the potential to impact fish and fish habitat will occur during timing windows designated by ADF&G and NMFS to minimize detrimental effects. Long-term operation of the broadband network will not result in any additional impacts to fish or fish habitat.

NANA will install bird deterrents on all aerial lines (Figure 3, additional information in Section 3.3.5.3). The bird diverters increase the visibility of the cable and decrease bird strikes. This project will install the same style diverters as used in the Arctic Slope Telephone Association Cooperative FOC project that connects Atqasuk to Utqiagvik, which are proven to be effective in Arctic environments and recommended by USFWS. The diverters spin in winds over 3 miles per hour, reflect light, glow during dawn and dusk, are visible to birds up to 1/4 mile away, and will be placed at 30-ft. intervals. The luminescent material on the diverters emits visible light for up to 12 hours after dusk and in low light or fog conditions.



Figure 3: Example of bird diverters to be installed on aerial crossings.

Clearing and/or grubbing activities will be necessary when vegetative cover prohibits wintertime off-road vehicle traffic (anticipated <10% of the full route). The proposed FOC alignment has been carefully selected to minimize forested and shrubby land cover to reduce the amount of clearing that would impact birds and other wildlife (Section 2.2.3).

The polar bear (*Ursus maritimus*) and two bird species, the Steller's eider (*Polysticta stelleri*) and spectacled eider (*Somateria fischeri*), are protected under the Endangered Species Act (ESA) and are known to exist within the project area. No adverse impacts are anticipated to affect these species as a result of this low-impact project.

Subsistence hunting was identified as a resource of concern related to project activities in agency meetings. Construction is planned for winter months and, therefore, limited or no interference with subsistence hunting activities are anticipated. NANA will adhere to the project specific stipulations defined in all permits/authorizations and will coordinate with all villages on timing of construction. Further consultation with local community members to develop specific construction procedures to limit subsistence impacts is anticipated.

2.6 CULTURAL RESOURCES

A desktop study of potential cultural resources in the project area is currently in development. This study will identify cultural resource sites, historic properties, and previous cultural resource investigations within the proposed construction corridor. It will also identify areas where cultural resources may be identified based on topography, area land uses, and other indicators. The desktop study will inform a potential summer (2025) field investigation that is anticipated to be performed to further inspect and identify cultural resources across the area.

Overall, the proposed project and construction methodologies are unlikely to disturb subsurface cultural resources. The primary concerns for disturbance would be at the river crossings and in the limited areas where trenching is proposed. The final placement of the FOC will be designed to avoid significant cultural resources sites.

2.7 WETLANDS

While the FOC corridor is primarily located within wetlands, the potential environmental impact is minimized through the winter-scheduled GLF methodology with LGPVs, which avoids ground disturbance in most areas. Disturbance is limited to activities necessary for the aerial river crossings (e.g., pole installations), subsea crossings, directional borings, and trenching near the villages, as detailed in Sections 3 and 4. The project and route have been designed to avoid and minimize wetland impacts to the extent possible. Temporary and permanent impacts are detailed in the USACE Section 404 permit application.

3.0 WINTER CONSTRUCTION ACTIVITIES

The majority of the project will be constructed during the winter months, which includes the GLF methodology across the terrestrial landscape, lakes/ponds, minor stream crossings, and some of the major stream crossings. This section outlines the proposed winter schedule and construction methodology.

3.1 WINTER SCHEDULE

The FOC ground-lay is planned to occur during the 2026 winter construction season. NANA intends to mobilize equipment, barge supplies, and stage materials in summer/fall 2025 and mobilize personnel in late December 2025 to commence the ground-lay in January 2026. Exact winter construction start dates will depend on requirements being met for adequate snow cover and ground conditions to support off-road winter travel (see Section 3.3 for more details). Cable inspections/seating, in-village work, and major water crossings will occur during the summer of 2026 (Section 4.0). The post-construction cable inspection and seating will be conducted via helicopters.

3.2 PRE-CONSTRUCTION ACTIVITIES

A ground survey of the route by snowmachine occurred in mid-March 2025. This reconnaissance effort helped to refine/optimize the proposed route, identify appropriate construction methodologies for some of the large river crossings, and reduce impacts by reducing waterbody crossings, avoiding challenging terrain/barriers, and assisting with the further development of a robust construction plan.

Cultural/archaeological surveys of the proposed route are being planned for late July to early August (2025). We will coordinate with ADNR as necessary for access to State lands for these activities.

3.3 WINTER CONSTRUCTION DETAILS AND METHODS

Construction is scheduled to commence in January 2026 pending receipt of necessary permits and land access agreements. The winter construction schedule will also be dependent on meeting requirements for snow cover/ground conditions sufficient for off-road winter travel. Potential

prerequisites may include a minimum of 6” of snow cover or a 12” frost layer for overland travel, and at least 32” of river ice or 40” of sea ice for waterbody crossings.

3.3.1 EQUIPMENT

To minimize ground disturbance, the cable will be placed during winter months utilizing purpose-built equipment designed to operate with minimal impact to the variable tundra landscape of the NAB (Table 1-4). LGPVs will be used to deploy the cable and transport personnel, camps, fuel, equipment, and cable tanks along the route.

Table 1-4: Construction equipment proposed to be used for the project.

Equipment	Model	Weight (lbs)
PistenBully (tracked)	PB600	18,000
CAT Dozer (tracked)	D6	50,400
Steiger Case Tractor (tracked)	535	55,000
Mulcher (tracked)		25,000
Mini-Excavators (tracked)		~18,000
Scissorneck Trailer		35,000
Flatdeck Trailer		26,000
Medium Sleigh Trailer		20,000

3.3.2 FIBER OPTIC CABLE SPECIFICATIONS

The FOC is armored and designed for extreme climate conditions. The cable consists of three main layers:

- Cable core: 24 strands of optical fiber surrounded by a rigid seam-welded copper tube filled with water blocking and hydrogen absorbing compound
- Armoring layer: twelve 1.7mm high tensile strength steel wires
- Outer protection: black high-density polyethylene (HDPE) sheath designed to seal the cable from water ingress

Cable size and durability-related specifications:

- Thickness: 0.472 in. diameter (smaller than a penny)
- Depth capability: >16,000 ft.
- Cable breaking load: 11,240 pounds of force
- Minimum bending radius: 2.5 ft.

A cross-section of the cable is provided in Figure 4, with an example of actual cable size.



Figure 4: Fiber optic cable specifications.

3.3.3 CONSTRUCTION SEQUENCE

Three full deployment trains consisting of 12–14 personnel each will operate simultaneously for the construction activities:

- One crew will start in Kivalina and work towards Noatak and Noatak River, and then to Noorvik and Kiana.
- Another crew will start in Kiana and build toward Ambler, Kobuk, Shungnak, and Selawik.
- A third crew will start in Kotzebue and ground-lay south along the Baldwin Peninsula to Buckland, Deering, and Selawik.
- The short subsea section, all in-village construction activity, and several complex river crossings will occur in summer 2026, following the main winter build (summer construction detailed in Section 4.0).

Winter installation will begin with a field survey of the planned FOC route to determine the precise path that the 30-ft. ROW will occupy. This will be followed by vegetation clearing (as needed to facilitate access by cable placement equipment [Table 1-4 and Figure 5]), pole placement in preparation for aerial cable crossings of larger rivers, and finally placement of the ground-laid FOC. Each deployment train will include:

- Tracked cable deployment equipment and a powered spooling system to ensure adequate slack during placement
- Mobile sleigh camp for crew housing
- Clearing equipment (for vegetation removal)
- Support snowmachines for crew transport
- Digging equipment for stream crossings and aerial pole installation

Where vegetation clearing is necessary, a mulcher will cut vegetation to the level of the snow surface and place the mulch in the same general area where the vegetation was removed. Clearing of vegetation will be limited to the 30-ft. construction corridor, though the corridor will be only as wide as necessary to support equipment passage (often only 15 ft. [Figure 5]). Vegetation requiring

clearing will primarily consist of woody shrubs with the potential to be taller than the required minimum 6-in. of snow cover, including willows (*Salix* sp.), dwarf birch (*Betula nana*), and green alder (*Alnus viridis*) (Wells et al. 2022). The preferential placement of the FOC is directly on the ground surface, so construction activities will attempt to avoid areas with a high density of shrubs. Larger diameter (> 9-12-in.) woody materials will be stockpiled and transported back to the nearest community for use as firewood.

3.3.4 TERRESTRIAL GROUND-LAY FIBER PLACEMENT

Overland route segments cross extensive wetlands and will be installed during winter months with adequate snow cover and frozen substrate to minimize ground disturbances.

The FOC will be spooled out of 20-ft. (length) sleigh-mounted cable tanks (Conex containers) that have approximately 24 miles of cable in each container. Cable will be laid directly on a prepacked trail via a powered spooler and crew members will manually guide the cable to the center of the alignment in a 12-ft. wide serpentine pattern to provide enough slack (3–5%) to accommodate the contour of the terrain, allowing it to settle on the vegetation and conform to changing surface features and environmental conditions (Figure 5).

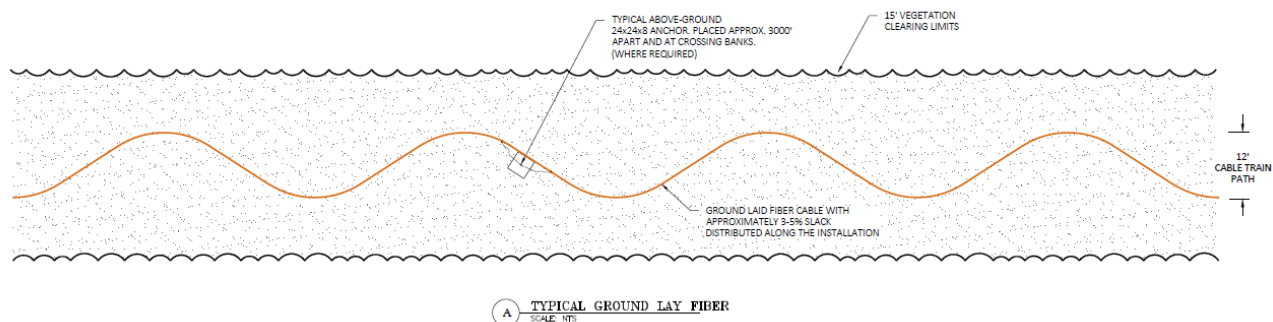


Figure 5: Typical example of ground-lay fiber placement.

Splices at intervals of roughly 24 miles, or closer as necessitated by site conditions, shall be enclosed within weatherproof splice enclosures designed to secure and protect the joint where FOCs are interconnected. Heavy, low-profile anchoring devices and cable grips will be deployed at splice points, elevation transitions, and at regular intervals of no greater than 6,000 ft. to mitigate lateral movement and preserve splice integrity (Figure 6). Additional cable weight, armor, and anchoring measures will be implemented as required during the cable deployment process to ensure stability and durability.

Along segments of the route where two cables are laid in the same corridor for redundancy (i.e., out and back from a village or the single corridor through Selawik NWR), the dual FOCs will be placed side by side during the ground-lay operation.

Track mounted GPS systems will verify placement within approved corridors and monitor linear footage to ensure 3-5% slack is provided (this will be placed in a serpentine pattern as shown in Figure 5). Winter deployment across the entire corridor is expected to last 100-110 days.

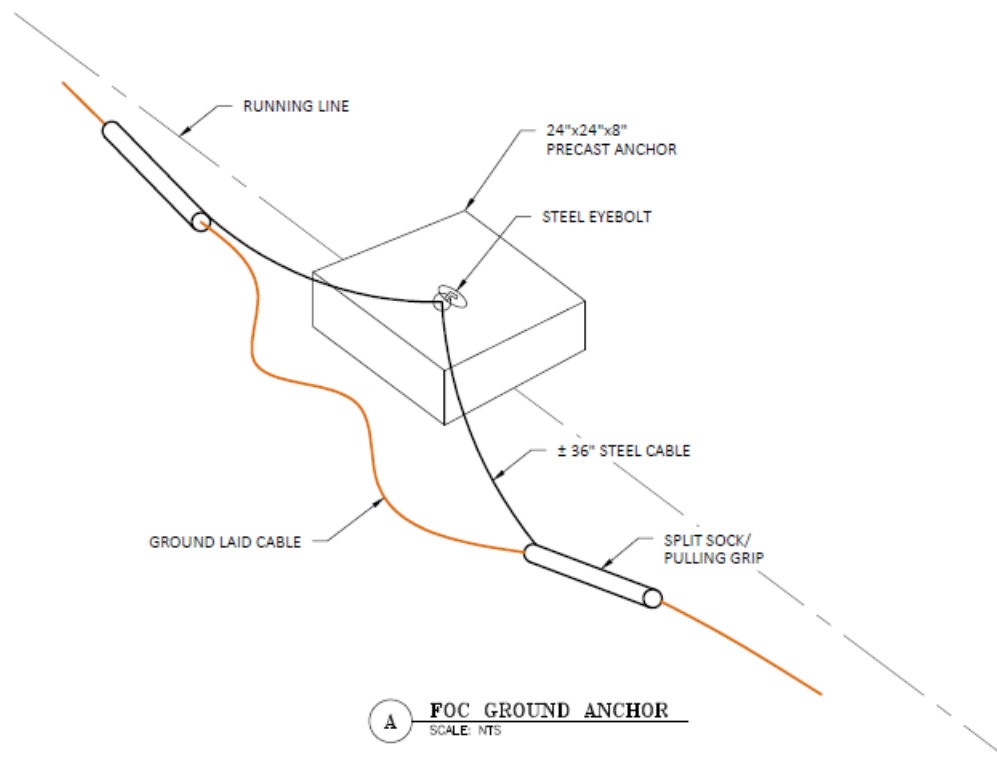


Figure 6: Schematic of the GLF anchor system.

3.3.5 WATERBODY CROSSINGS

While waterbody crossings are minimized by routing overland, when possible (Section 2.2.3), the project consists of nearly 800 stream and lake crossings. Attachment 3 provides a listing of these crossings.

Additionally, approximately 30 rivers will be crossed which are considered navigable waters, according to ADNR's Navigable Waters Map. Some of the more well-known rivers include the Wulik River, Kobuk River, Noatak River, Buckland River, and the Selawik River. This project recognizes that the submerged lands of navigable waters are state-owned. More specifics on the river crossings are depicted in the maps provided in Attachment 2, Figure 3 and the crossings table provided in Attachment 3, Table 3-1.

3.3.5.1 LAKES AND PONDS

When it is not possible to avoid a lake or pond, the cable will be laid with adequate slack on the ice/snow surface to facilitate the cable passively dropping to the bottom after the ice thaws. Anchors on either side of the waterbody will secure the cable at the top of the banks. The heavy anchors will be connected to the cable and placed on top of the snow surface. They will descend to the ground surface with the melting snow and will remain in place on the bank. The cable will sink into the waterbody under its own weight after ice thaws and is expected to self-bury within aquatic bed sediments over a short period of time.

3.3.5.2 MINOR STREAMS

For small streams/streams, the FOC will be laid in a manner similar to the deployment of lakes and ponds during winter construction. The cable will be deployed across the ice surface with enough slack for the cable to passively drop to the bottom of the stream once the ice thaws. Heavy anchors securing the cables will be placed on either stream bank. Care will be taken to position the crossings on stable banks (e.g., straight sections of rivers, well-graded bank material, gentle bank slope angle, etc.) to provide erosion protection and stability for the cable. Once the snow and ice melt, the anchors and cable will descend to the streambed or ground surface (Figure 7).

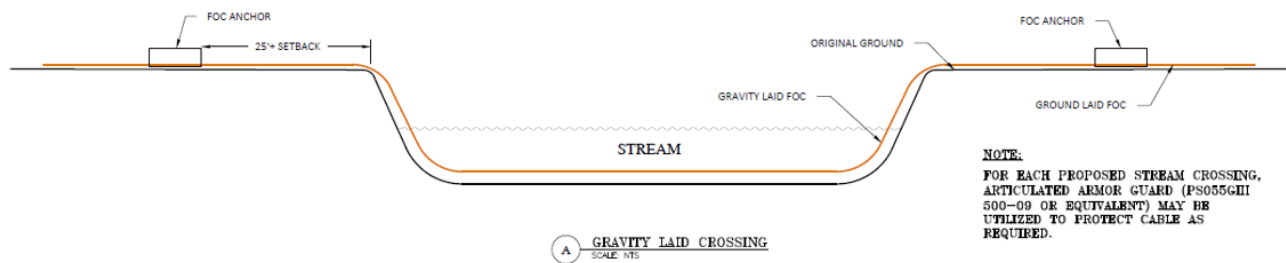


Figure 7: Typical gravity lay fiber cross-section for small stream crossings, as depicted after the snow melts.

When crossing incised streams with steep banks, the cable will need to be secured in the bank (Figure 8). These crossings will involve clearing snow, shallowly excavating into the bank using a mini excavator, placing the fiber in the trench, and backfilling the side cast bank material. The cable will transition to gravity laid in the stream bed. The number of such crossings will be minimized by selecting streams with more favorable geometry during construction that would allow for crossing without temporary bank disturbance, as illustrated in Figure 7.



Figure 8: Typical gravity lay fiber cross-section for small stream crossings with steep banks and high bank cut.

The contractor will install anchoring devices at each stream bank to minimize stress, avoid potential damage, and limit cable movement in flowing water (Figures 6-8). At crossings with substantial depth and turbulence, the FOC will be encased in split armor piping between anchor points to increase stabilization and protect the cable and prevent ice buildup. The armored piping will be continuous from an anchor on one side of stream bank to the anchor point on the opposite bank. It is expected that natural sediment transport will passively bury the cable over time.

For segments with dual-placed fiber (for system redundancy), the cables will be laid together and within the same protective conduit across small streams. This will minimize physical impacts on the environment.

Most waterbody crossings that bisect state lands will be accomplished through the gravity lay method. One large crossing at the Kiwalik River is proposed to occur during the summer using the directional drilling method (Section 4.2.2). No aerial crossings (Section 3.3.5.3) will be performed on State lands.

3.3.5.3 MAJOR RIVERS

At major river crossings, the FOC will be directionally bored (as described in Section 4.4.2 below), or will be run aerially over the water to allow safe passage for boats and wildlife. Construction for the largest river crossings may be performed in the summer, while construction for some major crossings will occur during winter.

The aerial crossing cable will be connected to 45–50-ft. wooden poles with the following conceptual design considerations:

- Drilling, excavating, or driving pile (method to be determined by ground conditions) into frozen tundra and placing wooden poles vertically
- Filling voids around pole with native fill material
- Splicing and mounting the cable
- Lashing the FOC to a galvanized steel cable and stringing over river crossings
- Increasing visibility of the cable and infrastructure at each aerial crossing:
 - Bird diverters to decrease bird strikes (Figure 3)
 - Aerial marker balls for aircraft safety
 - Reflective markers on guy wires and poles for travelers (e.g., boats and snowmachines) and wildlife

At aerial crossings, the anchoring design and configuration will ensure cable sag does not fall below the minimum engineered 20-ft. ice-loaded clearance above bank elevation. All aerial crossings have been designed with a single anchor attached to each pole (Figure 9). Where aerial applications involve dual FOCs sharing the same corridor, the cables will be installed on the same poles to minimize environmental and visual impacts.

Most waterbody crossings will be installed during the main winter construction window. However, there are exceptions for complex crossings that may take place in summer 2026, including the

Kobuk and Noatak Rivers and Kotzebue Sound (see Section 4.2.2). No aerial crossings will be performed on State lands.

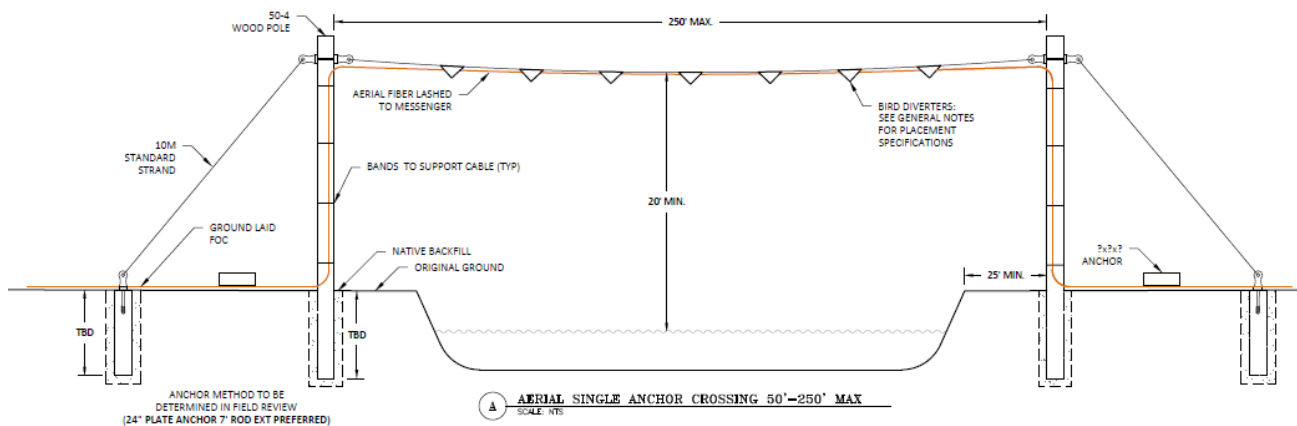


Figure 9: Schematic of an aerial crossing design.

4.0 SUMMER CONSTRUCTION ACTIVITIES

Several complex components of the project's construction will occur during the summer months, primarily the Hotham Inlet subsea crossing, several major river crossings, trenching outside of villages, and securing the FOC to existing utility poles. This section outlines the proposed summer schedule and construction methodology.

4.1 SUMMER SCHEDULE

The summer construction schedule will commence once sea and river ice melts, allowing barges hauling equipment to travel upriver (approximately May 2026). Construction within the villages will occur throughout the summer of 2026. Subsea construction is scheduled for June-July 2026. Major river crossings (e.g., Kobuk River and Noatak River) will occur June-August 2026. Winter GLF inspections and cable seating will take place from July-August 2026. Finally, demobilization and final inspections will be completed by September 2026. This schedule is subject to change and all stakeholders will be kept informed of project activities.

4.2 SUMMER CONSTRUCTION DETAILS AND METHODS

Snow and ice-free conditions are needed for some of the more complex construction components of the project. The subsea crossing at Kotzebue Sound, major river crossings, and work occurring in and near villages (including trenching and tying into existing utility poles) will occur during the summer; and their construction methodologies are detailed in this section.

4.2.1 SUBSEA CROSSING (KOTZEBUE SOUND)

For the subsea crossings, FOC will be anchored to 48-in. by 78-in. concrete beach manholes (BMH) on either side of the channel, which will be constructed in stable locations that minimize environmental impacts. The cable will then be trenched between the BMH and the lowest tide

point. Construction will then be transitioned to operations utilizing an excavator on floats, two tugboats (25-ft. and 92-ft. long) and two accompanying barges (150 ft. by 50-ft. and 205 ft. by 60-ft.). From the low tide point, the barge will place cable in tandem with the excavator on floats to be trenched as far as possible. Once the water is too deep to allow trenching, the cable will be gravity laid or static plowed across the sea floor to the opposite side of the inlet, where near shore trenching and laying activities will commence (Figure 10). BMPs will be implemented throughout the operation to protect the aquatic environment, minimize bank erosion, and avoid creating drainage paths. Construction of the subsea crossing is expected to take 4-6 days.

NOTE:

BMH ON EITHER END, TRENCHED/PLOWED CABLE FROM BMH TO LOW TIDE POINT, CABLE PLACED ON OCEAN BOTTOM FOR CROSSING.

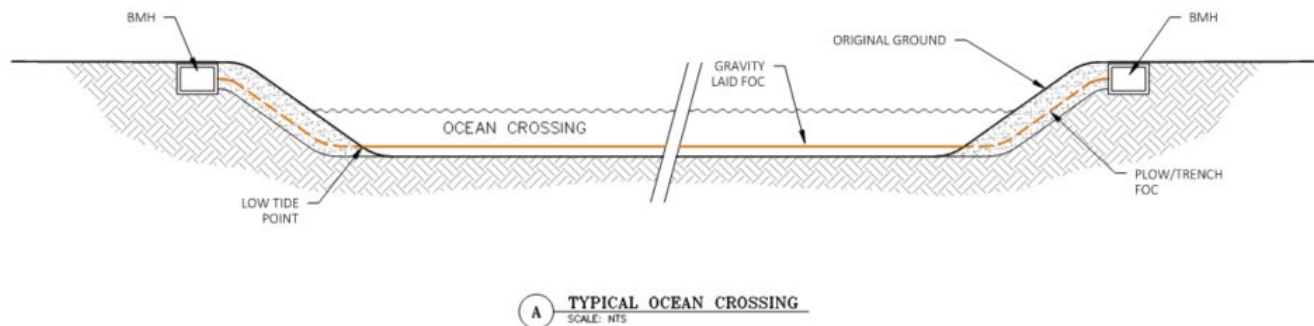


Figure 10: Schematic of the subsea cable crossing.

4.2.2 MAJOR RIVER CROSSINGS

Directional boring equipment needed for the major river crossings will be transported upriver by the tugboats and barges utilized in the subsea crossing. Some of the equipment to be transported includes mini-excavators, utility poles, and the FOC. One of the barges may serve as the field camp facility.

NANA anticipates utilizing Horizontal Directional Drilling (HDD) at 14 locations: the Noatak River and side channels (2), Little Noatak Slough, Buckland River, Kiwalik River, Kugruk Estuary, the Kobuk River crossings (6), Ambler River, and Pick River. The FOC will be installed approximately 4 ft. beneath the riverbed. One of these HDD crossings, the Kiwalik River, is located on State lands.

This trenchless construction method involves drilling a pilot hole along a pre-determined, curved path starting from an entry point on one riverbank to an exit point on the opposite bank (Figure 11). The pilot hole will then be incrementally enlarged using reaming tools to accommodate the installation of the pipeline or utility conduit. Drilling fluid, typically a bentonite-water mixture, will be used to stabilize the borehole, lubricate the drill bit, and transport cuttings to the surface. Following the completion of the borehole, the 2-in. conduit and FOC will be pulled through the hole and secured. On both sides of the river, 15-20 feet of conduit will extend from the borehole openings to serve as a transition to ground-level installation, providing protection for the cable and

mitigating potential damage from freeze-thaw cycles. The ends of these pipes will be sealed and watertight.

Drilling operations will comply with site-specific erosion and sediment control plans and include 24/7 monitoring to ensure the integrity of the drill path and avoid inadvertent returns of drilling fluid to the river. All activities will adhere to federal, state, and local permitting requirements, with restoration of the affected areas to pre-construction conditions upon project completion.

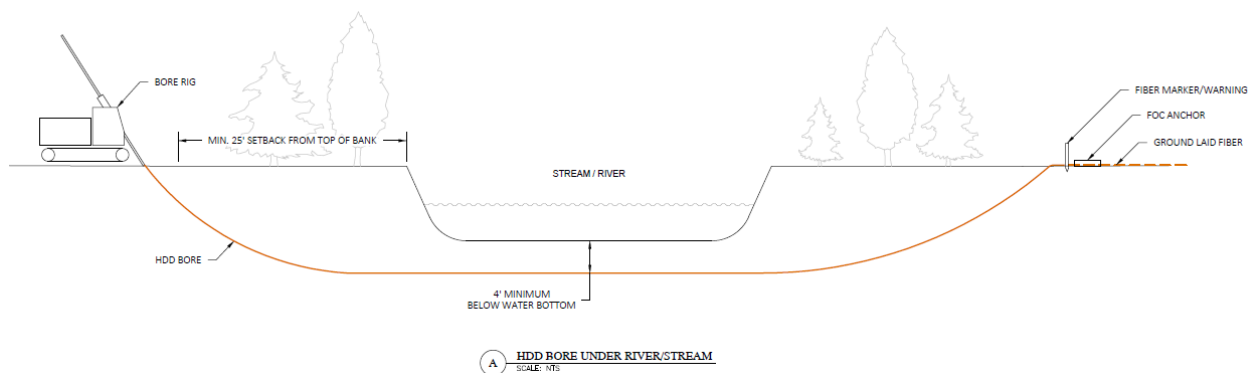


Figure 11. Schematic of an underground river crossing using Horizontal Directional Drilling (HDD).

4.2.3 AERIAL UTILITY POLE INSTALLATION

The project will utilize existing utility poles outside of Kivalina and Kotzebue. Pole access agreements are being initiated with the appropriate utilities.

4.2.4 TRENCHING

Where ground-lay sections have high pedestrian or ATV traffic, the cable will need to be buried to reduce risk to public safety and to prevent cable damage. The project will utilize the existing utility poles when exiting villages then transition to shallow trenched sections. The trenches will extend for varying lengths outside of each village:

- Ambler: 500 ft.
- Buckland: 150 ft.
- Deering: 60 ft.
- Kotzebue: 200 ft.
- Noatak: 250 ft.
- Noorvik: 1500 ft.
- Shungnak: 500 ft.
- Selawik: 600 ft.
- Kiana, Kivalina and Kobuk will not require trenching.

Trenches will be excavated approximately 2 ft. x 2 ft., but may vary with the terrain, and the cable will be laid directly into the trench. Side cast material will be temporarily placed (i.e., less than 1 week) adjacent to the trench, and then backfilled and recontoured to the original pre-existing

conditions. Trench depth will always be contained within the organic vegetation mat, which will allow the trenched vegetation to heal while providing sufficient protection for the cable.

This construction segment will require a 3-person line crew and a 2-person splicing crew immediately behind them.

4.3 INSPECTIONS OF WINTER GROUND-LAY AND AERIAL SEGMENTS

Following winter construction activities, a crew may return in the summer to ensure the cable is properly seated on the tundra and to ensure all construction materials and debris have been cleared from the area. Inspections will be performed by helicopter flyovers, while paying particular attention to waterbody crossings to ensure that the anchors and cable are seated securely to the ground and substrate and aerial poles are not leaning. Where significant anomalies are observed, the helicopter will land so cable realignment can be performed by the inspectors.

4.4 ROUTE SURVEY

Prior to completion of construction, an as-built survey will be prepared in coordination with ADNR's Survey Section to ensure that all required survey details are collected. As-built drawings will include the actual dimensions, locations, and features of the project as it was built on the ground. The as-built drawings will help ensure that future modifications and maintenance can be accomplished accurately and safely.

4.4 COMMUNITY CONNECTIONS

While not part of this "middle mile" project, the full project includes the installation of the appropriate FOC into each community, providing service for individual households, businesses, schools, and other entities. These connections will utilize FOC linked through the CLS's planned for each community, with cable hung on existing utility poles and appropriate service drops for each served customer. NANA is self-funding this investment for the "last-mile" infrastructure in these communities.

5.0 WASTES AND HAZARDOUS SUBSTANCES

All waste and hazardous substances handling will follow applicable federal, state, and local regulations, with detailed tracking and records throughout the process.

5.1 WASTE TYPES, WASTE SOURCES, AND DISPOSAL METHODS

All waste generated from the project will be securely contained and disposed of properly. Much of the waste will be backhauled to the Kotzebue landfill, however some waste will be transported to nearby local community landfills. When appropriate, material that can be reused or recycled will be separated and appropriately delivered to locations for community beneficial reuse or backhauled for recycling.

The following types of waste may be generated during construction:

- **Solid Wastes:** Excess cable, connectors, plastic spools, packaging materials, and general construction waste will be transported back to Kotzebue or backhauled to a larger landfill for proper disposal. Materials that can be reused or recycled, such as fiber optic spools, will be separated and backhauled to an appropriate facility.
- **Wood Wastes:** Excess wood from packaging materials, pallets, and wooden support poles will either be backhauled to Kotzebue or provided to local communities for beneficial reuse.
- **Food and Domestic Wastes:** Excess food and domestic waste materials generated by construction crews will be contained and transported to local community landfills for proper disposal.

5.2 HAZARDOUS SUBSTANCES

Hazardous substances necessary during construction will be stored within traveling equipment securely away from sources of heat, sparks, and flames and within secondary containment structures. The storage area will be cool, dark, and well-ventilated. Hazardous substances traveling with the construction crews will include:

- **Diesel Fuel:** Stored in double-walled 5,000-gallon fuel sleighs with appropriate dispensing systems and spill prevention measures. See Figure 12 for photo of fuel storage sleighs.
- **Gasoline Fuel:** Approximately 110-gallons of unleaded gasoline will be stored in polyethylene drums, with secondary containment, for use in generators and other equipment as needed. Appropriate dispensing systems and spill prevention measures will be used when transferring gasoline.
- **Hydraulic Oil:** Stored in properly labeled and secured stainless steel or polyethylene drums within traveling equipment or mobile camps, with secondary containment provided. Approximately 200 gallons of oil will be consumed per month of construction.
- **Antifreeze, lubricant, windshield washer fluid, and brake cleaner:** Small quantities (approximately 5 gallons each) of these preventative maintenance fluids will be stored in properly labeled and secured containers with secondary containment.
- **Lead acid batteries:** Two 12-V lead acid batteries will be on-site to start and power various equipment. Care will be taken when handling batteries, and they will be securely stored away from other fluids.
- **Drill fluid (i.e., drill mud):** For the HDD activities, a bentonite-water mixture will be used to stabilize the borehole, lubricate the drill bit, and transport cuttings to the surface. This fluid will be mixed as needed for daily drilling activities using the bentonite powder and clean water. Bentonite will be stored in dry sacks. HDD activities will be performed in the summer as noted previously.

Materials Safety Data Sheets (MSDS) for all hazardous substances to be used during construction can be found in Attachment 4.

The following types of hazardous waste may be generated during construction:

- **Used Oil and Lubricants:** These liquids will be collected in sealed containers and transported to Kotzebue for proper hazardous waste disposal. Approximately 25 gallons of used oil and lubricants will be generated during each month of project construction. Used oil and lubricants will be stored in a structurally sound and leak-proof 55-gallon drum that is made from polyethylene.
- **Fuel Residues and Spills:** In the event of a spill, contaminated soils or absorbent materials will be stored in separate containers and stored securely until their proper disposal.



Figure 12: Mobile diesel fuel storage sleigh with two 2,500-gallon double walled tanks.

5.3 SPILL PLAN AND SPILL PREVENTION

Effective spill prevention and response measures will be implemented during project construction. Implementation measures include:

- Proper handling and storage, such as secure and appropriate containers for each substance and safe transportation, limited storage, and strategic placement of hazardous materials to minimize spill risks.
- All hazardous materials will be stored within a secondary containment structure.
- Hazardous substance transfers will always take place within a containment berm and/or while utilizing a drip pan. Absorbent materials will be readily available during transfer.
- All containers will be clearly labeled.
- Daily inspection of all storage areas, containers, and equipment will occur to look for signs of leaks, corrosion, or other issues. Preventative maintenance on tanks, valves, or pumps will be performed regularly.

- Daily record keeping of inspection activities, and maintenance of accurate records when materials are stored or disposed of.
- Spill kits will be readily available at all work sites and in all vehicles containing absorbent materials, contaminated chemical waste bags, gloves, and brooms.
- Personal Protective Equipment, including gloves and safety glasses, will be readily available.
- Key personnel will be trained in spill response management and all personnel will be trained in spill response procedures.
- Any spills will be immediately reported to appropriate agencies.

The development of several plans/policies are anticipated to guide construction activities. These will be provided through the NEPA analysis stage of the project and may include the following:

- Waste Handling Plan
- Wildlife Interaction Plan
- Cultural Resources Orientation and Management Plan
- Weed Control/Invasive Species Management Plan
- Stormwater Pollution Prevention Plan (SWPPP)

6.0 OPERATIONS AND MAINTENANCE

The FOC network will have minimal operations and maintenance requirements following construction. NANA will conduct periodic inspections by helicopter to assess cable condition, focusing on river crossings and areas with high traffic that are prone to physical disturbances. In the event of a cable break or service interruption, emergency repairs will be carried out by NANA technical staff, village technicians, or qualified contractors with experience in Arctic environments. If a break occurs, the system will automatically switch feed to the redundant route, and the technicians at the Network Operating Center will use an Optical Time Domain Reflectometer to pinpoint the fault's location. Depending on the location and season, a technician will travel to the site using a helicopter in summer or a helicopter, snowmachine, or other LGPV in winter. Repairs will involve splicing the damaged section or replacing it with a new cable segment. Repair materials, such as spare cable and splicing supplies, will be pre-staged on NANA property in each village to ensure rapid response.

No regular brush clearing is planned along the ROW, except in cases where substantial vegetation growth occurs around aerial crossings. In such instances, clearing will be conducted using helicopter access or snowmachines during winter. All maintenance activities will adhere to the same environmental protection measures implemented during the initial construction phase.

7.0 CLOSURE AND RECLAMATION PLAN

The FOC network is anticipated to have a service life of 50 years. If the service life can be extended beyond the 50 years, NANA anticipates taking advantage of this possibility and working with ADNR to extend the ROW agreement if necessary.

The cable is anticipated to sink into the surrounding vegetation once the snow melts. Arctic Slope Telephone Association Cooperative (ASTAC) installed a similar GLF on the tundra between Atkasuk and Utqiagvik in late winter 2022 (ASTAC 2024). After two full years, this cable is now barely visible in many locations, as it becomes incorporated into the underlying vegetation over time. This will render removal of the cable very challenging and damaging to the landscape. Additionally, access for the cable removal would have to occur during winter, which would require significant digging through the snow/ice (and into the frozen ground) using heavy equipment. This would increase potential damage to the sensitive tundra habitat. For these reasons, NANA proposes the following closure and reclamation measures:

1. Cable Removal: The FOC will be abandoned in-place.
2. Aerial Crossings: The wooden poles installed for aerial crossings will be cut at their base and laid on the ground at their locations. Guy wires, bird diverters, visibility marker balls, and other associated infrastructure will be removed.
3. Waste Disposal: All removed materials will be disposed of in the nearest community landfill.
4. Final Inspection: A comprehensive inspection will document the condition of the site after reclamation activities are complete.
5. If upon final inspection and closure activities there is any unaddressed environmental damage due to project infrastructure, such as streambank erosion or poor revegetation, measures will be implemented to address and resolve these environmental impacts.

8.0 REFERENCES

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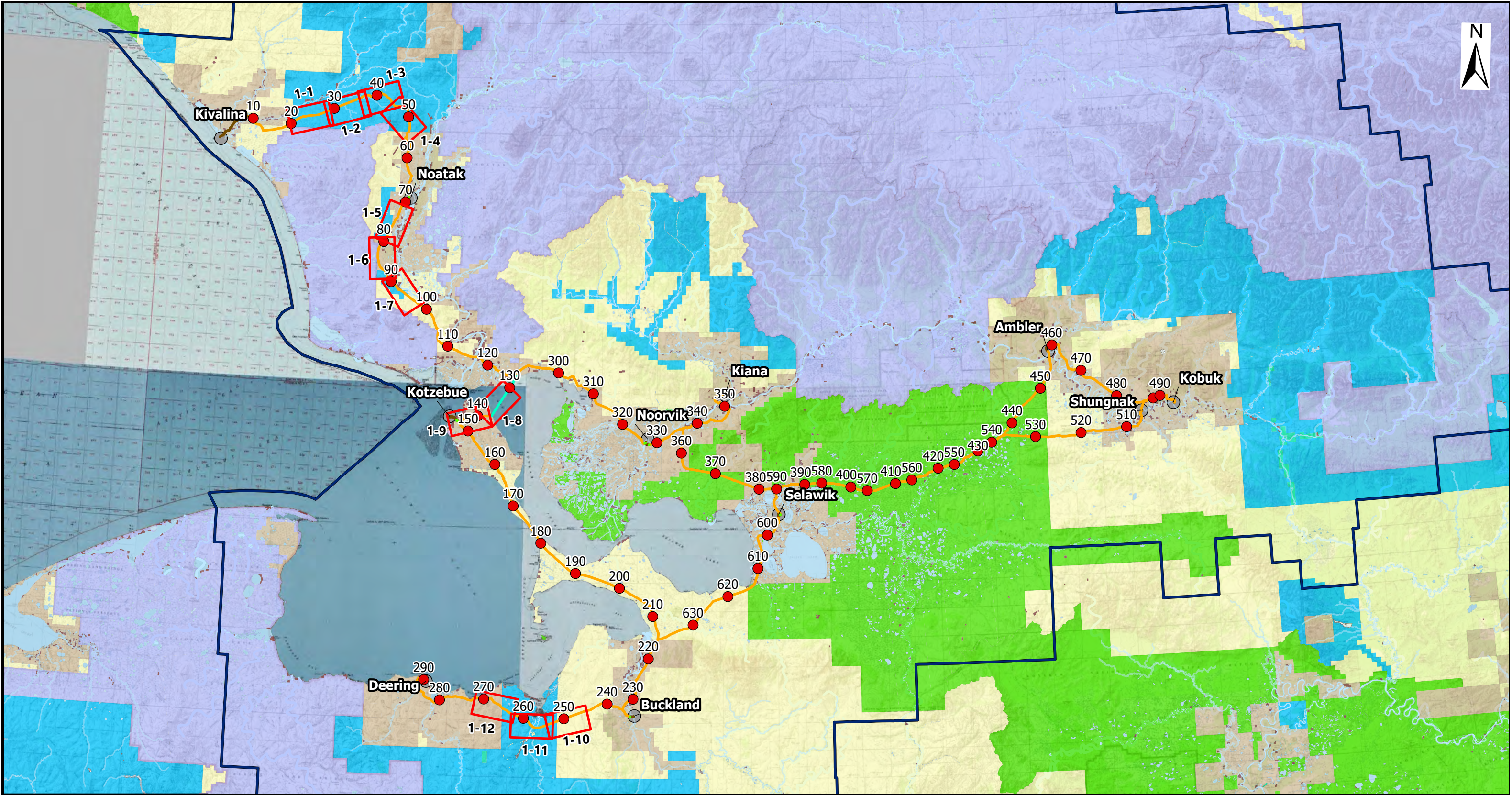
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Attachment 2:

PROJECT ROUTE MAPS ON STATE LAND



Broadband Fiber Route

- Aerial Fiber Segment
- Terrestrial Fiber Segment
- Subsea Fiber Segment
- Trench Fiber Segment

Land Ownership

- Native Allotment
- Native Lands
- Bureau of Land Management
- Department of Defense
- Fish and Wildlife Service

Legend

- Local Government
- National Park Service
- Other Federal
- Private
- State
- Waterbody

- Northwest Arctic Borough Boundary
- Community
- Area Map Boundary Sheets
- Navigable Waterways
- Fiber Mile Markers (10 Mile Intervals)

Scale: 1:1,250,000
1 inch equals 20 miles

Notes:

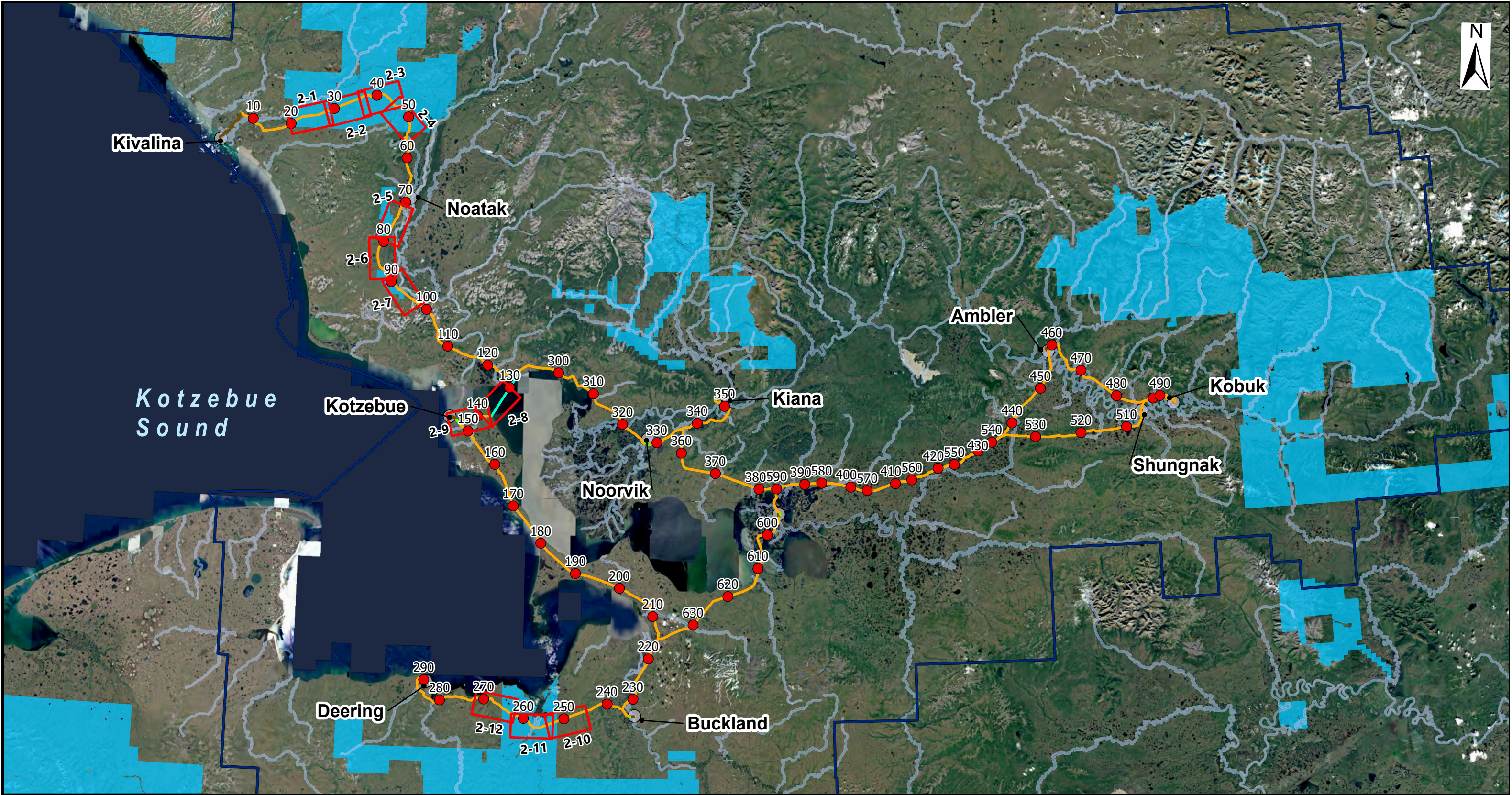
- Coordinate system is NAD 1983 State Plane Alaska 7, Unit: Feet
- Background imagery is from USGS Topography Map.
- Stream data is from Alaska Department of Fish and Game (ADF&G) & USGS National Hydrography Dataset (NHD)

Site Development - Overview Landownership Map
Alaska Department of Natural Resources
Division of Mining, Land & Water - Land Use Permit
Site Development Diagram

Date Prepared: 6/5/2025	Applicant's Name: NANA	File #: 165.030800
MTRS: T6N, R15W: 1, 2, 3, 4, 6, 7, 8, 9, T7N, R15W: 36, T6N, R16W: 1, T7N, R16W: 19, 20, 27, 28, 29, 34, 35, 36, T17N, R18W: 11, 12, T28N, R19W: 6, 7, 8, 17, 20, 29, 32, T24N, R20W: 16, 29, T28N, R20W: 1, 2, 3, T29N, R20W: 26, 27, 28, 29, 30, 35, 36, T28N, R21W: 6, T29N, R21W: 25, 26, 33, 34, 35, T28N, R22W: 1, 2, 9, 10, 11, 16, 17, 18, 19, T28N, R23W: 20, 21, 22, 23, 24, 29, 30, 31, KM		SHEET 1

Attachment 3:

WATERBODY CROSSING TABLE AND ANALYSIS



Legend

Broadband Fiber Route

- Aerial Fiber Segment
- Terrestrial Fiber Segment
- Subsea Fiber Segment

Trench Fiber Segment

Fiber Mile Markers (10 Mile Intervals)

Area Map Boundary Sheets

Northwest Arctic Borough Boundary

Community

State Land

Navigable Waterways

0 15 30 60 Miles

Notes:

- Coordinate system is NAD 1983 State Plane Alaska 7, Unit: Feet
- Background imagery is from USGS Topography Map.
- Stream data is from Alaska Department of Fish and Game (ADF&G) & USGS National Hydrography Dataset (NHD)

Scale: 1:1,250,000
1 inch equals 20 miles

NANA

Site Development - Overview Hydrology Map
Alaska Department of Natural Resources
Division of Mining, Land & Water - Land Use Permit
Site Development Diagram

Date Prepared: 6/5/2025	Applicant's Name: NANA	File #: 165.030800
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MTRS:
T6N, R15W: 1, 2, 3, 4, 6, 7, 8, 9.T7N, R15W: 36.T6N, R16W: 1.T7N, R16W: 19, 20, 27, 28, 29, 34, 35, 36.T17N, R18W: 11, 12.T28N, R19W: 6, 7, 8, 17, 20, 29, 32.T24N, R20W: 16, 29.T28N, R20W: 1, 2, 3, T29N, R20W: 26, 27, 28, 29, 30, 35, 36.T28N, R21W: 6.T29N, R21W: 25, 26, 33, 34, 35.T28N, R22W: 1, 2, 9, 10, 11, 16, 17, 18, 19.T28N, R23W: 20, 21, 22, 23, 24, 29, 30, 31. KM

SHEET 2

Attachment 3:

WATERBODY CROSSING TABLE AND ANALYSIS

Water crossings represent one of the most critical aspects of project design. The project crosses a total of 765 streams and rivers and 68 lakes or ponds, with 47 streams and 8 lakes encompassed on State lands. Tables 3-1 and 3-2 and the Figure 3 maps (Attachment 2) describe the stream and lake crossings on State lands. Other substantial crossings are Kotzebue Sound and Kugruk Estuary (near Deering).

NANA has taken a careful, methodical approach to analyzing these crossings to ensure the protection of water quality, fish habitat, and traditional uses while maintaining system reliability.

The crossing data presented in Table 3-1 was developed through rigorous analysis combining multiple data sources, including reviews of high-resolution aerial/satellite imagery, the USGS National Hydrography Dataset, route reconnaissance, and consultations with experts familiar with seasonal variations in these waterways. This multi-layered approach ensures that even smaller, seasonally significant waterbodies are properly identified and accounted for in project planning.

While NANA anticipates crossing at those locations provided in Table 3-1 and depicted in the maps (Attachment 2, Figure 3 series), the precise crossing locations are subject to minor refinements within the project corridor. This flexibility in the “permanent” corridor and final crossing locations means NANA can install the FOC along an optimal path of least resistance through the dynamic landscape of the NAB and thereby reduce potential aquatic and other environmental impacts.

Anadromous waters are particularly important in the Alaska context as they support fish species that migrate from the ocean and up rivers to spawn in freshwater environments. These waters are critical for maintaining healthy populations of culturally and economically significant species such as salmon, which represent not only an essential subsistence resource for local communities but also play a vital role in the broader ecosystem. NANA acknowledges the importance of these waters and implements construction methods specifically designed to protect these valuable habitats and the fish populations they support.

The project referred to the Alaska Department of Fish and Game’s (AGFG) Anadromous Waters Catalog (AWC) to identify 27 anadromous streams/rivers across the whole project, with four anadromous streams identified on State lands (Table 3-1). While only four waterbodies are identified as anadromous in the AWC, the project assumes there are resident fish and unrecorded anadromous fish at the other 44 stream or river crossings on State lands.

The winter timing of construction activities protects fish species when they are shielded by overlying ice. Construction traffic will only cross waterbodies at frozen, ice-covered locations. Conducting construction during the winter months minimizes potential impacts to fish species and their habitats. Rivers, creeks, streams, and lakes will only be crossed at locations with adequate ice and snow cover to ensure minimal disturbance.

The project crosses a Navigable Waterway 61 times, including 11 instances where cables will be collocated along redundant route sections. One navigable waterway crossing, Kiwalik River, is also located on State land. These are key transportation corridors for local communities, supporting both subsistence activities and transportation between villages. At these locations, the crossings will be constructed either with aerial installation or horizontal directional drilling (HDD). The aerial crossings will be designed with a minimum clearance of 20 feet above the highest anticipated water level, accommodating the passage of typical watercraft used in the region including aluminum skiffs and larger freight boats. The aerial pole design (as detailed in the POD Attachment 1, Section 3.3.5.3) ensures structural integrity while providing ample space for boats with tall superstructures or antennas to pass safely beneath the cable crossing. The HDD construction will install fiber optic cable approximately 4 ft. beneath the riverbed (see POD Attachment 1, Section 4.2.2 for more details). This method is ideal for limiting potential environmental risk for the short- and long-term duration of the project. These crossings have been specifically engineered to maintain unimpeded river access for all seasons and water levels, preserving the traditional and practical uses of these important waterways.

Following construction, NANA will implement a monitoring program for all waterbody crossings along State lands, with particular attention to the four identified anadromous streams. Spring and summer inspections will verify proper cable placement, assess any potential erosion issues, and confirm that crossings are functioning as designed. If any issues are identified, NANA will work promptly with ADNR and appropriate regulatory agencies to implement corrective measures that protect both the infrastructure and the environmental values of these important waterways.

By combining careful route selection, winter construction timing, appropriate crossing designs, and ongoing monitoring, the project minimizes potential impacts to the important waterbodies on State lands. This approach respects both the ecological significance of these waters and their cultural importance to the NANA region residents who rely on them for subsistence and transportation needs.

Table 3-1: Stream crossings on State of Alaska lands.

Crossing ID	Install Method	Construction Timing	River Name	Navigable (Y/N)	Anadromous (Y/N)	NHD Reach Code	Latitude (dd)	Longitude (dd)	MTRS
10	Ground Lay	Winter				19050404003861	67.78873	-163.95238	K028N023W31
11	Ground Lay	Winter				19050404003901	67.80107	-163.90875	K028N023W29
12	Ground Lay	Winter				19050404003986	67.81297	-163.79173	K028N023W23
13	Ground Lay	Winter				19050404003974	67.81444	-163.76486	K028N023W24
14	Ground Lay	Winter				19050404004018	67.82036	-163.72115	K028N022W18
15	Ground Lay	Winter				19050404004020	67.82575	-163.69004	K028N022W17
16	Ground Lay	Winter				19050404004038	67.82921	-163.67007	K028N022W17
17	Ground Lay	Winter				19050404004099	67.84075	-163.60325	K028N022W10
18	Ground Lay	Winter				19050404004105	67.84381	-163.58549	K028N022W11
19	Ground Lay	Winter				19050404004103	67.84459	-163.58100	K028N022W11
20	Ground Lay	Winter			YES	19050404004107	67.85076	-163.54516	K028N022W01
21	Ground Lay	Winter				19050404004130	67.85569	-163.51641	K028N022W01
22	Ground Lay	Winter				19050404010120	67.85957	-163.49380	K028N021W06
23	Ground Lay	Winter				19050404010120	67.86061	-163.48778	K028N021W06
24	Ground Lay	Winter				19050404010120	67.86074	-163.48700	K028N021W06
25	Ground Lay	Winter				19050404004148	67.87510	-163.40307	K029N021W35
26	Ground Lay	Winter	Tutak Creek		YES	19050404004078	67.87575	-163.40062	K029N021W35
27	Ground Lay	Winter			YES	19050404004184	67.88202	-163.33543	K029N020W30
28	Ground Lay	Winter				19050404004189	67.89141	-163.25818	K029N020W21
29	Ground Lay	Winter				19050404004187	67.88644	-163.21175	K029N020W27
30	Ground Lay	Winter				19050404004181	67.86777	-163.15708	K029N020W36
31	Ground Lay	Winter				19050404010103	67.85176	-163.09609	K028N020W01
32	Ground Lay	Winter				19050403011254	67.84964	-163.06906	K028N020W01
33	Ground Lay	Winter				19050403031387	67.82072	-163.01091	K028N019W17
34	Ground Lay	Winter				19050403011639	67.81188	-163.00659	K028N019W20
35	Ground Lay	Winter				19050403011636	67.80084	-163.00082	K028N019W29
64	Ground Lay	Winter				19050403013676	67.31575	-163.12015	K022N020W09
65	Ground Lay	Winter				19050403013685	67.31457	-163.11796	K022N020W09
66	Ground Lay	Winter				19050403013687	67.31158	-163.11094	K022N020W16

Crossing ID	Install Method	Construction Timing	River Name	Navigable (Y/N)	Anadromous (Y/N)	NHD Reach Code	Latitude (dd)	Longitude (dd)	MTRS
67	Ground Lay	Winter				19050403013689	67.30820	-163.10015	K022N020W15
68	Ground Lay	Winter				19050403012494	67.30210	-163.08073	K022N020W15
69	Ground Lay	Winter				19050403031341	67.29874	-163.07003	K022N020W23
70	Ground Lay	Winter				19050403012135	67.29412	-163.05922	K022N020W23
71	Ground Lay	Winter				19050403012505	67.28443	-163.03544	K022N020W26
72	Ground Lay	Winter				19050403012506	67.28437	-163.02890	K022N020W25
73	Ground Lay	Winter				19050403012509	67.27963	-163.00934	K022N020W25
181	Ground Lay	Winter				19050202001913	65.95934	-161.71694	K007N015W36
182	Ground Lay	Winter				19050202001914	65.95675	-161.73348	K006N015W01
183	Ground Lay	Winter	Wabash Creek			19050202001849	65.94753	-161.79212	K006N015W03
184	Ground Lay	Winter				19050202001964	65.93856	-161.86389	K006N015W08
185	HDD	Summer	Kiwalik River	YES	YES	19050202000352	65.93840	-161.87890	K006N015W08
186	Ground Lay	Winter				19050202002760	65.94847	-161.91383	K006N015W06
187	Ground Lay	Winter				19050202002804	65.96210	-161.94755	K007N016W36
188	Ground Lay	Winter	Mud Creek			19050202002779	65.96537	-161.95926	K007N016W36
189	Ground Lay	Winter	Minnehaha Creek			19050202002830	65.96892	-161.98354	K007N016W35
190	Ground Lay	Winter	Richmond Creek			19050202002819	65.97536	-162.02298	K007N016W27
191	Ground Lay	Winter				19050202002907	65.98378	-162.07665	K007N016W29
192	Ground Lay	Winter	Virginia Creek			19050202002903	65.98970	-162.09637	K007N016W20

Table 2-2: Lake crossings on State of Alaska lands.

Crossing ID	Install Method	Construction Timing	Lake Crossing Length (ft)	NHD Reach Code	Latitude (dd)	Longitude (dd)	MTRS
17	Ground Lay	Winter	189	19050202006947	65.93870	-161.86011	K006N015W08
18	Ground Lay	Winter	178	19050202006922	65.93996	-161.88931	K006N015W08
19	Ground Lay	Winter	203	19050202006920	65.94113	-161.89813	K006N015W07
20	Ground Lay	Winter	153	19050202006902	65.94327	-161.90417	K006N015W06
21	Ground Lay	Winter	129	19050202006871	65.94449	-161.90569	K006N015W06
22	Ground Lay	Winter	133	19050202006860	65.94513	-161.90636	K006N015W06
23	Ground Lay	Winter	127	19050202006830	65.94678	-161.90887	K006N015W06

Table 3-3. Marine crossing at Hotham Inlet. Note: State land will not be constructed upon for the marine crossing, but Kotzebue Sound (and Hotham Inlet) are considered State waters.

Crossing Location	Install Method	Construction Timing	Marine Crossing Length (ft)	Latitude (dd)	Longitude (dd)	MTRS
North Inlet	Subsea	Summer	53, 935	67.02797	-162.07344	K019N016W024
South Inlet	Subsea	Summer		66.90216	-162.26800	K017N016W006