US Army Corps of Engineers
Alaska District

Juneau Field Office
Regulatory Division (1145)
CEPOA-RD
Post Office Box 22270
Juneau, Alaska 99802-2270

Public Notice of Application for Permit

PUBLIC NOTICE DATE:	**January 5, 2022**
EXPIRATION DATE:	**January 20, 2022**
REFERENCE NUMBER:	**POA-2001-00086**
WATERWAY:	**Thayer Creek**

Interested parties are hereby notified that a Department of the Army permit application has been received for work in waters of the United States as described below and shown on the enclosed project drawings.

All comments regarding this Public Notice should be sent to the address noted above. If you desire to submit your comments by email, you should send it to the Project Manager's email as listed below. All comments should include the Public Notice reference number listed above.

All comments should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. Please contact Randal Vigil at (907) 201-5022, or by email at Randal.P.Vigil@usace.army.mil if further information is desired concerning this notice.

APPLICANT: Kootznoowoo, Incorporated (Jonathan J. Wunrow), 8585 Old Dairy Road, Suite 104, Juneau, AK 99801.

AGENT: HDR Alaska, Inc. (Mark Dalton), 2525 C Street, Suite 500, Anchorage, AK 99503.

LOCATION: The project site is located within Section 35, T. 49 S., R. 67 E., Section 2, 11, 12, 13, 24, 25, T. 50 S., R. 67 E., and Section 30, T. 50 S., R. 68 E., Copper River Meridian; USGS Quad Map Sitka C-2; Latitude 57.553709º N., Longitude 134.600859º W.; near Angoon, Alaska.

SPECIAL AREA DESIGNATION: The project is located within the Tongass National Forest, Admiralty Island National Monument, Kootznoowoo Wilderness.

PURPOSE: The applicant's stated purpose is to bring reliable, lower-cost renewable energy to Angoon by constructing a financially viable and logistically feasible hydroelectric facility on Thayer Creek, which will reduce energy costs for Angoon and its consumption of and dependence on diesel fuel, and in turn, improve air quality in the community.

PROPOSED WORK: The application requests authorization to place fill material into waters of the United States to construct the following project components:

1. A 19 foot high concrete gravity diversion structure at the head of the anadromous fish barrier falls on Thayer Creek that would create an approximately 0.7 acre impounded area.

2. A concrete intake structure and sluiceway on the northwestern abutment of the diversion structure (Diverted flow would first enter the sluiceway, then be drawn through a trashrack and into the penstock to reach the powerhouse).

3. A 72-inch diameter steel pipeline (penstock), approximately 85 feet long, to convey water from the intake structure to the powerhouse.

4. A powerhouse, approximately 30 feet long by 40 feet wide and 25 feet tall, to contain a vertical-axis Kaplan turbine and synchronous generator with a rated capacity of 800 to 850 kilowatts (kW).

5. A short tailrace channel to return flows to Thayer Creek near the base of the falls.

6. A small electrical switchyard located adjacent to the powerhouse.

7. An unpaved, gravel access route approximately 6.7 miles long, to provide reliable year-round access to the hydroelectric facility on Thayer Creek and along the overhead transmission line for construction and long-term maintenance, including bridges and culverts to maintain drainage and fish passage, as needed, and quarry site(s) adjacent to the access route to generate fill material for the road, staging areas, the switchyard, and the powerhouse site.

8. A 12.5-kilovolt overhead transmission line to transmit the power generated at Thayer Creek to Angoon, which would consist of two segments: a. An overhead transmission line, approximately 6.7 miles long, to transmit power from the switchyard to a transition staging area directly across from Angoon, and b. An approximately 1,400 foot long submarine cable in a directionally drilled micro-tunnel under Kootznahoo Inlet to an interconnection point in Angoon.

9. A marine barge landing and small boat boarding float on Kootznahoo Inlet (Stillwater Anchorage). The landing area's drivable surface would be approximately 24 feet wide and 225 feet long. Ten 24-inch diameter steel pipe piles would be permanently installed below the Mean High Water Mark (approximate elevation +13 feet below the 0.0 foot contour) would support the boarding float.

10. A 125 by 200 foot staging and permanent storage yard upslope from the marine landing to facilitate construction and for long-term storage and maintenance, including quarry site(s) adjacent to the access route to generate fill material for staging areas and an access route connecting to the marine access point.

11. A 50 by 100 foot work area from which to conduct horizontal directional drilling (HDD) and transition the above-ground transmission line to a submarine cable in the directionally drilled micro-tunnel from Turn Point to Angoon.

Project Component	Footprint (Acres)					Regulated Activity
		Above HTL[a]	Between HTL and MHW	Below MHW	Total Discharge	
Barge landing, boarding float, access route, storage and work areas, powerhouse, and diversion (cut/fill footprint)	37.38	14.65a	0.03	0.60	**15.3**	***Discharge of Fill***
Vegetation clearing beyond cut/fill footprint	39.63	17.68	--	--	**17.68**	***Mechanized Land Clearing*** *Beyond Discharge of Fill*
Submarine HDD micro-tunnel	0.02	<0.00	<0.00	0.02	0	(No fill discharge required)

High Tide Line (approximate elevation +18.6 feet below the 0.0 foot contour) (HTL)
[a] Includes 0.14 acre of fill in Thayer Creek for the in-water bridge pier and abutment, and structural fill necessary for culvert installation in 469.4 linear feet of perennial streams and 201.6 linear feet of intermittent streams.

Fill Type	Fill Volume (cubic yards)	
	Waters	Wetlands
Armor fill for barge landing	478	2,149
Structural rock fill (access route and work areas, bridge pier and abutment, and bedding material for culverts)	450	68,285
Concrete (diversion and intake)	286	2,303
Totals	**1,214**	**72,737**

All work would be performed in accordance with the enclosed plan (sheets 1-29), dated November 24, 2021.

ADDITIONAL INFORMATION: Other State and Federal authorizations needed for the proposed project: Alaska Department of Fish and Game Title 16 Fish Habitat Permit, United States Forest Service (USFS) Special Use Permit, and Alaska Department of Natural Resources Water Rights Permit.

APPLICANT PROPOSED MITIGATION: The applicant proposes the following mitigation measures to avoid, minimize, and compensate for impacts to waters of the United States from activities involving discharges of dredged or fill material.

a. Avoidance: Kootznoowoo has designed the project to avoid impacts to sensitive landforms, such as high vulnerability karst and, where practicable, Waters of the United States (WOTUS). Topography, design standards, and land management limit where the access route can be constructed. The project area, located within the Hydro-Reserve and bound by Chatham Strait to the west, comprises relatively steep terrain intermixed with forested wetlands, with some ponds and lakes. The access route is designed with relatively steep side slopes (1.5:1), which allows the project to avoid WOTUS in some cases and minimize the overall project footprint. The design incorporates several measures to avoid adverse impacts on fish habitat, Essential Fish Habitat (EFH), and marine mammals. In-water work will be limited to certain time periods to avoid affecting critical life history stages (e.g., fish spawning and egg development). To avoid dewatering EFH in lower Thayer Creek, the design sites the tailrace to discharge directly to the plunge pool at the base of the anadromous fish barrier. The intake structure design includes a mechanism to avoid prohibiting downstream gravel and woody debris recruitment. Kootznoowoo also proposes to employ a trained Marine Mammal Observer (MMO) to look for marine mammals during in-water work so impact and vibratory hammer operation does not occur in the presence of marine mammals, if necessary. Best management practices (BMPs) and other measures will be used to minimize the potential for adverse impacts when full avoidance is not practicable.

b. Minimization: Kootznoowoo commits to implementing several BMPs and mitigation measures to minimize potential impacts of construction, operations, and maintenance. The Forest Service's *Soil and Water Conservation Handbook* describes several BMPs for the Alaska Region.

c. Compensatory Mitigation: No compensatory mitigation is proposed.

WATER QUALITY CERTIFICATION: A permit for the described work will not be issued until a certification or waiver of certification, as required under Section 401 of the Clean Water Act (Public Law 95-217), has been received from the Alaska Department of Environmental Conservation. This Public Notice and Notice of Application for State Water Quality Certification (enclosed) serves as written correspondence to the certifying authority of a reasonable period of time to act. The complete application was received on December 21, 2021; the applicable reasonable period of time to act on the certification request is 75 days; a waiver will occur on March 20, 2022, if the certifying authority fails or refuses to act on the certification request.

CULTURAL RESOURCES: The latest published version of the Alaska Heritage Resources Survey (AHRS) has been consulted for the presence or absence of historic properties, including those listed in or eligible for inclusion in the National Register of Historic Places. There are cultural resources (**SIT-00049, SIT-00182, SIT-00314, SIT-00696, SIT-00695, and SIT-00700)** in the permit area and/or within the vicinity of the permit area. Kootznoowoo proposes to implement measures to minimize potential impacts to cultural resources during construction, operations, and maintenance. A Heritage Resources Mitigation Plan would be developed prior to commencement of ground disturbing activities. The Mitigation Plan would address potential adverse effects to historic properties, make recommendations to mitigate those effects, and would address the process for any inadvertent discoveries made during

construction. The Mitigation Plan would be developed in consultation with the State Historic Preservation Office (SHPO), Kootznoowoo, Inc., the USFS, and the Angoon Community Association. A USFS approved archaeologist would be present on-site during project layout in high sensitivity areas and ground disturbing activities to monitor ground disturbance. The Admiralty National Monument Ranger would be contacted immediately, and work cease, if historic properties or cultural materials not previously considered are encountered during project implementation. Work would proceed only after that consultation process has been completed and a plan to mitigate the effects has been developed, if needed. Additional details on Stop Work authority and notification procedures would be outlined in the Mitigation Plan. Should human remains be encountered during project implementation, all work in the locality would cease immediately and Kootznoowoo's designated Environmental Compliance Monitor would contact the Forest Archaeologist and Alaska State Troopers. If Native American remains are encountered on National Forest lands, the USFS would follow Native American Graves Protection and Repatriation Act regulations set forth in 43 CFR 10. Federally recognized tribes and Alaska Native Claims Settlement Act Corporations would be notified of inadvertent discoveries and consulted to determine an action plan on how to proceed. The procedures for notifications would be addressed in the Mitigation Plan. Consultation of the AHRS constitutes the extent of cultural resource investigations by the U.S. Army Corps of Engineers (Corps) at this time. The Corps has made a No Adverse Effect determination for the proposed project. This application is being coordinated with SHPO. Any comments SHPO may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit will be considered in our final assessment of the described work.

ENDANGERED SPECIES: The project area is within the known or historic range of the western distinct population segment (DPS) Steller sea lion (*Eumetopias jubatus*) and Mexico DPS Humpback whale (*Megaptera novaeangliae*).

We have determined the described activity may affect Mexico DPS Humpback whales and western DPS Steller sea lions. We will initiate the appropriate consultation procedures under Section 7 of the Endangered Species Act with the National Marine Fisheries Service (NMFS). Any comments they may have concerning endangered or threatened wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH).

The project area is within the known range of the Chinook (*Oncorhynchus tshawytscha*), chum (*Oncorhynchus keta*), coho (*Oncorhynchus kisutch*), pink (*Oncorhynchus gorbuscha*), and sockeye (*Oncorhynchus nerka*) salmon.

We have determined the described activity would not adversely affect EFH in the project area.

TRIBAL CONSULTATION: The Alaska District fully supports tribal self-governance and government-to-government relations between Federally recognized Tribes and the Federal government. Tribes with protected rights or resources that could be significantly affected by a proposed Federal action (e.g., a permit decision) have the right to consult with the Alaska District on a government-to-government basis. Views of each Tribe regarding protected rights and resources will be accorded due consideration in this process. This Public Notice serves as notification to the Tribes within the area potentially affected by the proposed work and invites their participation in the Federal decision-making process regarding the protected Tribal right or resource. Consultation may be initiated by the affected Tribe upon written request to the District Commander during the public comment period.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, reasons for holding a public hearing.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts of the proposed activity and its intended use on the public interest. Evaluation of the probable impacts, which the proposed activity may have on the public interest, requires a careful weighing of all the factors that become relevant in each particular case. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. The outcome of the general balancing process would determine whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur. The decision should reflect the national concern for both protection and utilization of important resources. All factors, which may be relevant to the proposal, must be considered including the cumulative effects thereof. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving 404 discharges, a permit will be denied if the discharge that would be authorized by such permit would not comply with the Environmental Protection Agency's 404(b)(l) guidelines. Subject to the preceding sentence and any other applicable guidelines or criteria (see Sections 320.2 and 320.3), a permit will be granted unless the District Commander determines that it would be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

AUTHORITY: This permit will be issued or denied under the following authorities:

(X) Perform work in or affecting navigable waters of the United States – Section 10 Rivers and Harbors Act 1899 (33 U.S.C. 403).

(X) Discharge dredged or fill material into waters of the United States – Section 404 Clean Water Act (33 U.S.C. 1344). Therefore, our public interest review will consider the guidelines set forth under Section 404(b) of the Clean Water Act (40 CFR 230).

Project drawings a Notice of Application for State Water Quality Certification are enclosed with this Public Notice.

District Commander
U.S. Army, Corps of Engineers

Enclosures

MIKE DUNLEAVY, GOVERNOR

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
401 Certification Program
Non-Point Source Water Pollution Control Program

ANCHORAGE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WQM/401 CERTIFICATION
555 CORDOVA STREET
ANCHORAGE, ALASKA 99501-2617
PHONE: (907) 269-7564/FAX: (907) 334-2415

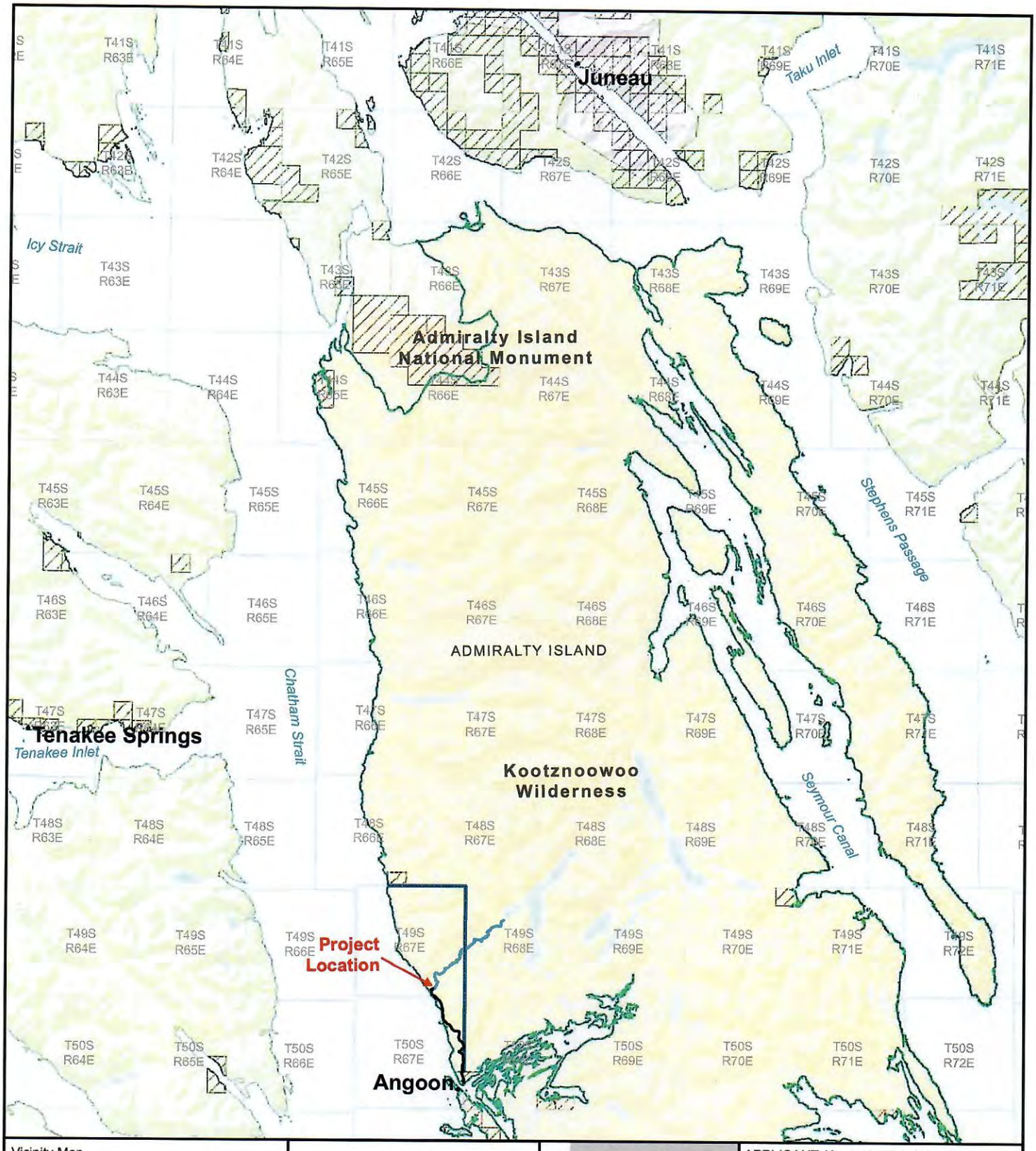
NOTICE OF APPLICATION
FOR
STATE WATER QUALITY CERTIFICATION

Any applicant for a federal license or permit to conduct an activity that might result in a discharge into navigable waters, in accordance with Section 401 of the Clean Water Act of 1977 (PL95-217), also must apply for and obtain certification from the Alaska Department of Environmental Conservation (ADEC) that the discharge will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. By agreement between the U.S. Army Corps of Engineers and ADEC, application for a Department of the Army permit to discharge dredged or fill material into navigable waters under Section 404 of the Clean Water Act also may serve as application for State Water Quality Certification.

Notice is hereby given that the application for a Department of the Army Permit described in the Corps of Engineers' Public Notice No. **POA-2001-00086, Thayer Creek**, serves as application for State Water Quality Certification from ADEC.

After reviewing the application, ADEC may certify there is reasonable assurance the activity, and any discharge that might result, will comply with the Clean Water Act, the Alaska Water Quality Standards, and other applicable State laws. ADEC also may deny or waive certification.

Any person desiring to comment on the project, with respect to Water Quality Certification, may submit written comments to the address above by the expiration date of the Corps of Engineer's Public Notice.



Vicinity Map

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 2.5 5 Miles

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- 2020 Project Features
- Thayer Creek
- ANILCA Hydro Reserve North-Eastern Boundary*
- Private or Municipal Lands
- Admiralty Island National Monument
- Kootznoowoo Wilderness
- Other U.S Forest Service Lands

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30, Copper River Meridian

FIGURE 1 of 29

DATE: 11/24/2021

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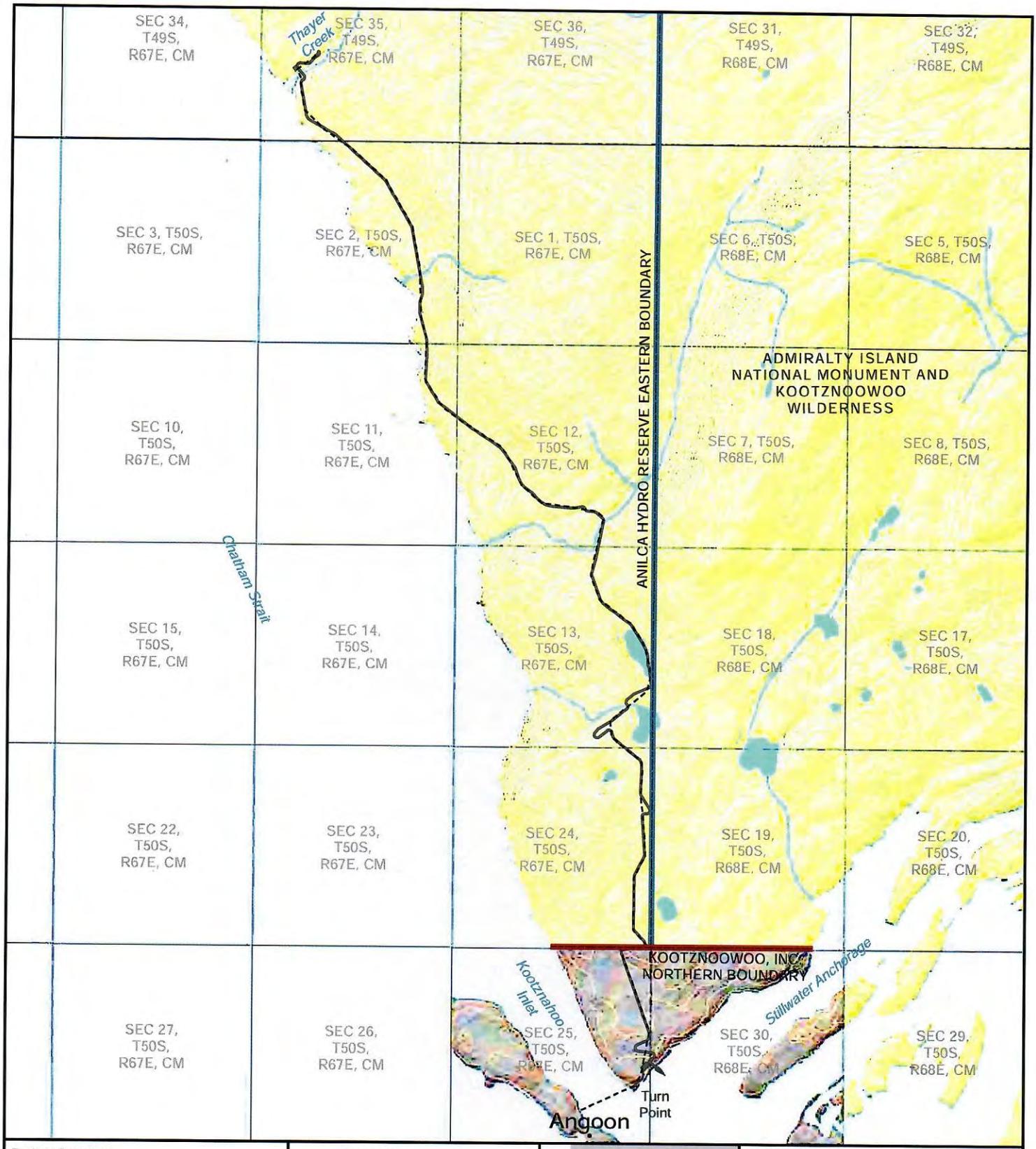

Project Overview

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 0.25 0.5 Miles

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- Access Route
- Transmission Line
- Project Area
- Streams (NHD)
- Kootznoowoo, Inc. Northern Property Boundary
- ANILCA Hydro Reserve Eastern Boundary*
- U.S. Forest Service
- Private or Municipal Lands

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian, T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 2 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG02_PROJECTOVERVIEW.MXD - USER: CBRISBOIS - DATE: 11/23/2021

Plan View Index

Thayer Creek
Hydroelectric Project

0 0.25 0.5 Miles

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- Plan View Figure Index
- Overland Transmission Line
- Cut and Fill Footprint
- Streams (HDR)
- Streams (NHD)
- Wetlands/Waters (HDR)

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 3 of 29

DATE: 11/24/2021

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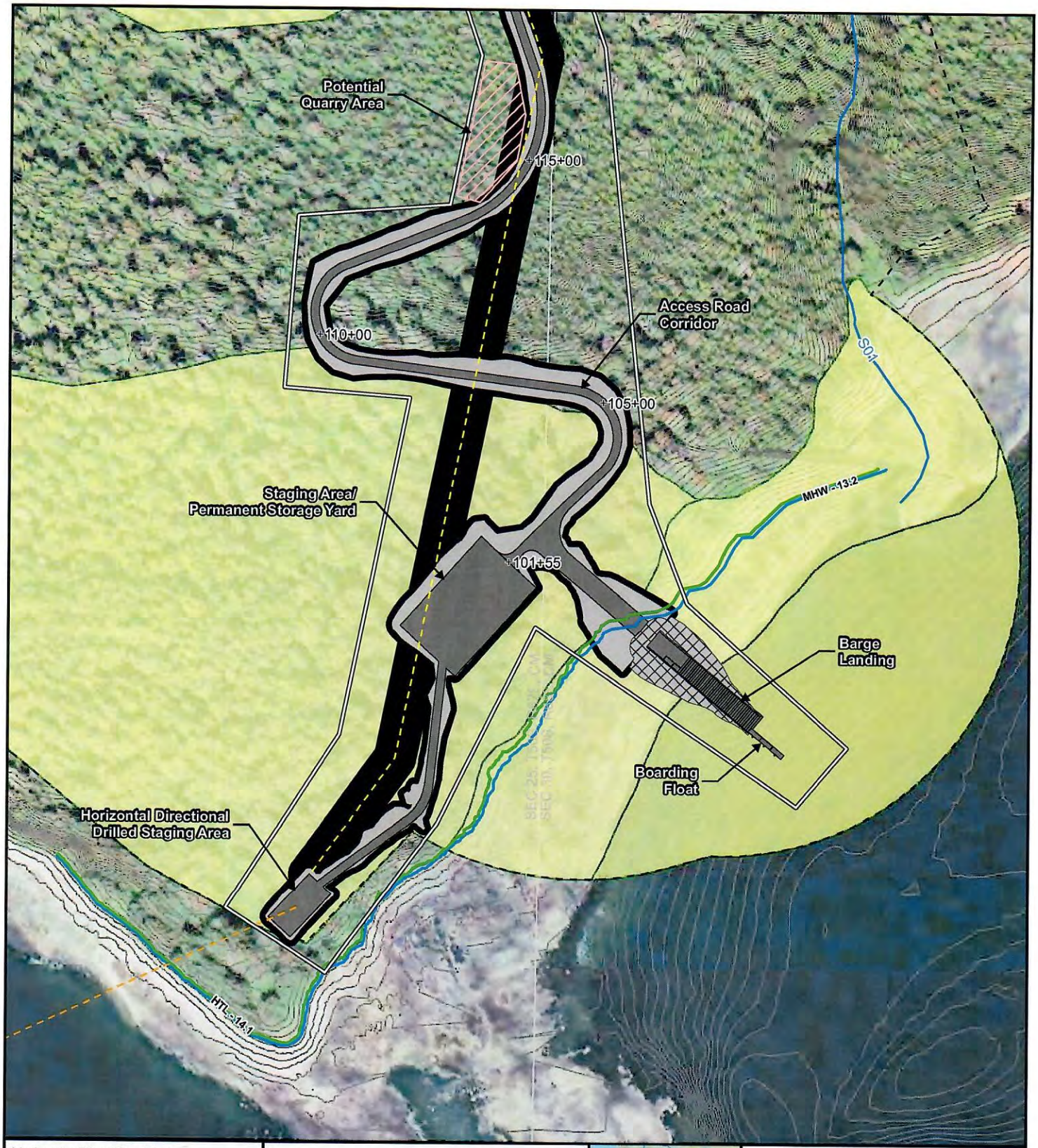

Marine Facilities Plan View

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 100 200 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

ROW
Overland Transmission Line
Submarine Transmission Line
Potential Quarry Area
Project Features
Armored Fill
Cut and Fill Footprint
Mechanized Land Clearing
Wetlands Mapping Area
Wetlands/Waters (HDR)
Streams (HDR)
HTL
MHW
2ft Contour
+ Stationing

Angoon

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 4 of 29

DATE: 11/24/2021

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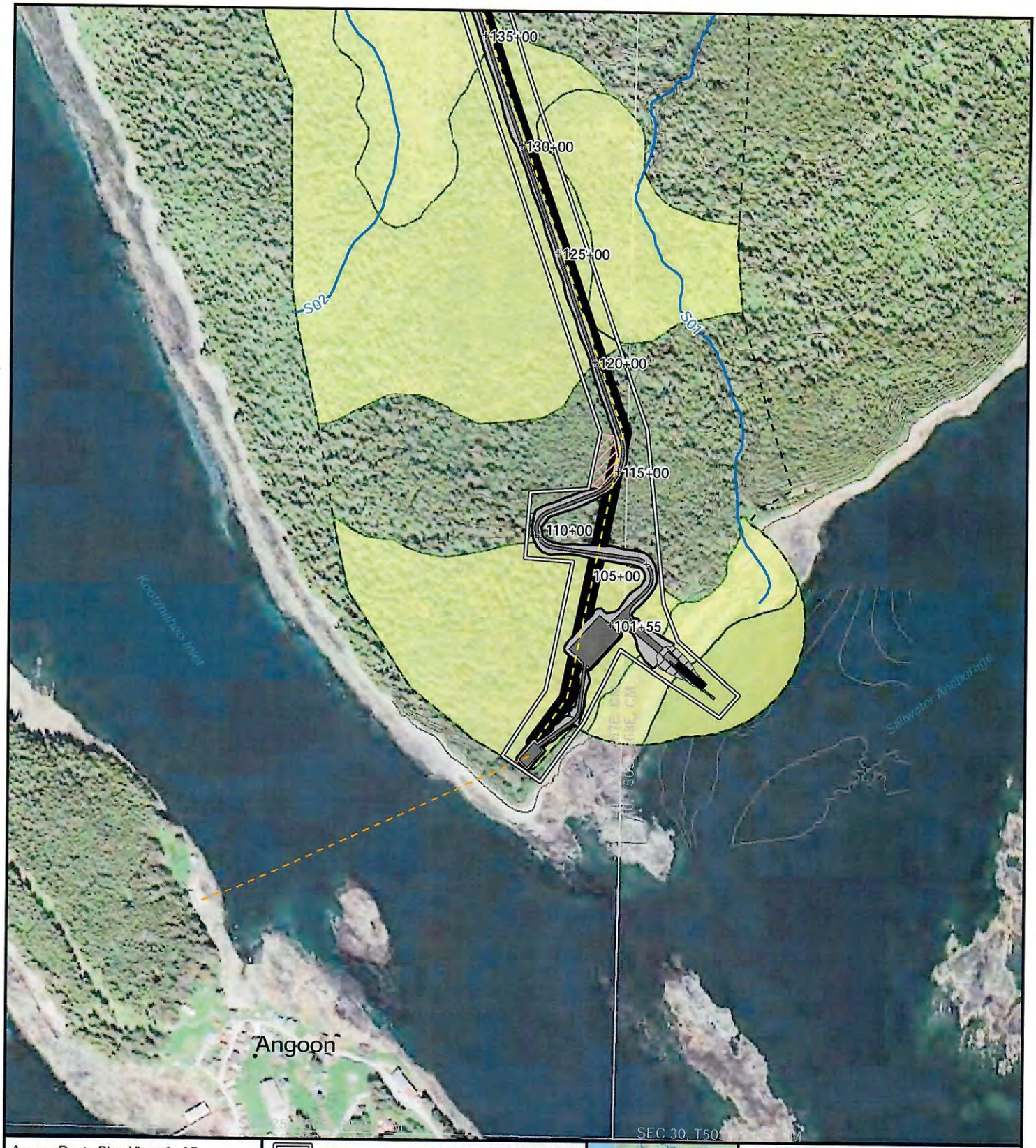

Access Route Plan View, 1 of 7

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- ROW
- Overland Transmission Line
- Submarine Transmission Line
- Project Features
- Cut and Fill Footprint
- Mechanized Land Clearing
- Potential Quarry Area
- Wetlands Mapping Area
- Wetlands/Waters (HDR)
- Streams (HDR)
- 10ft Contour
- + Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 5 of 29

DATE: 11/24/2021

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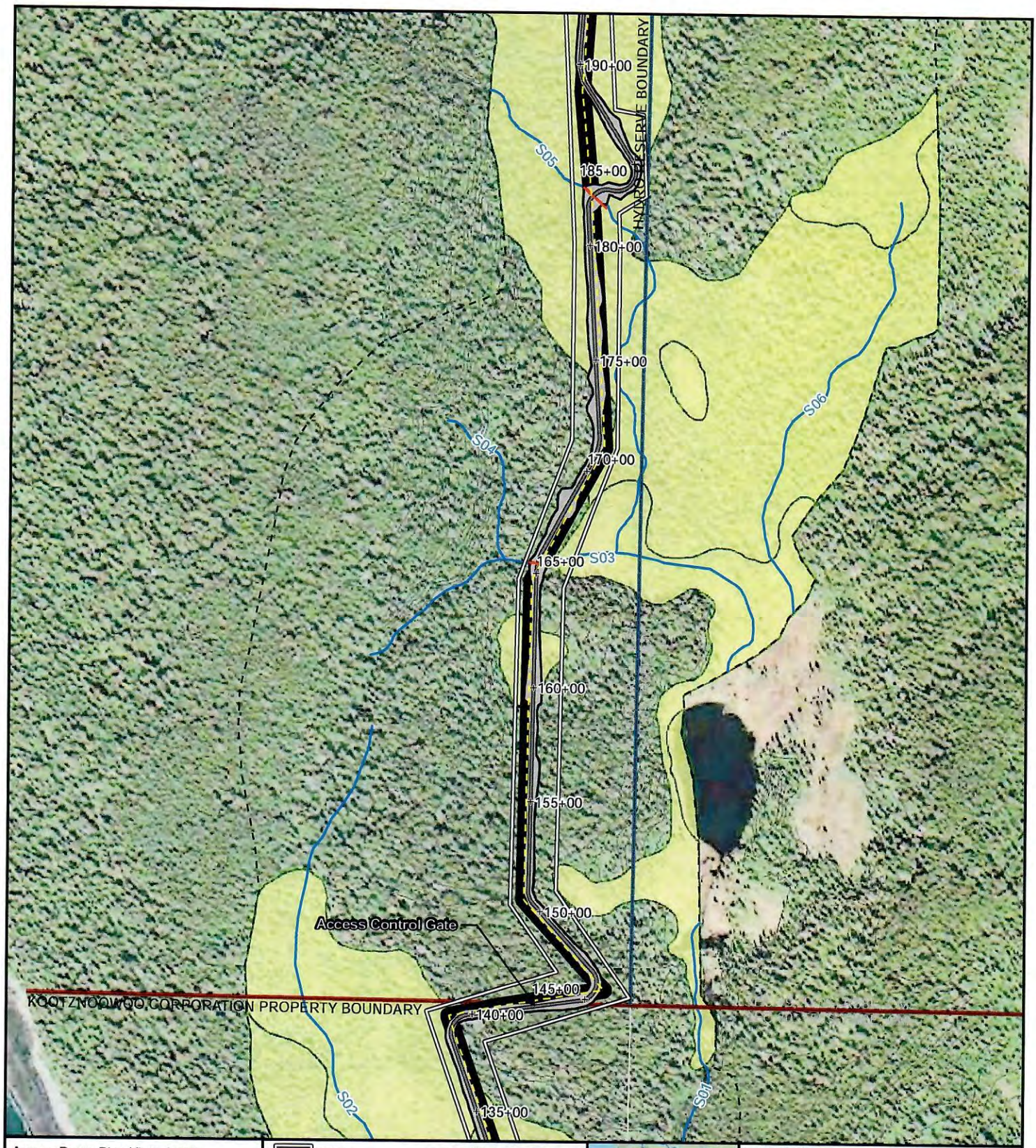


Access Route Plan View, 2 of 7

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- ROW
- Overland Transmission Line
- Culvert
- Project Features
- Cut and Fill Footprint
- Mechanized Land Clearing
- Wetlands Mapping Area
- Wetlands/Waters (HDR)
- Streams (HDR)
- 10ft Contour
- Hydro Reserve Boundary*
- Kootznoowoo Corp. Property Boundary
- + Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

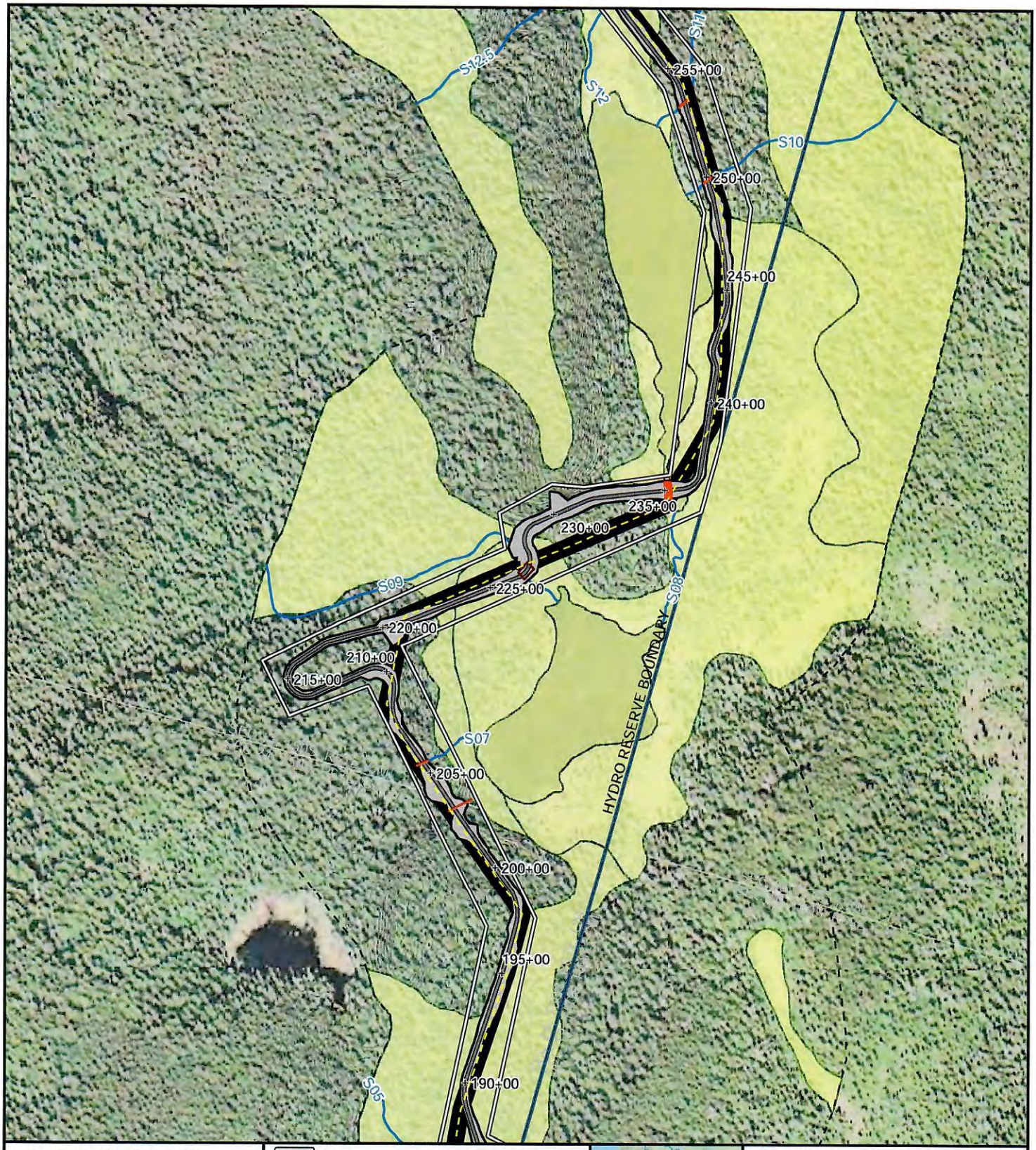
WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 6 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG05-11_PLANVIEW_MPBK.MXD - USER: CBRISBOIS - DATE: 11/23/2021



Access Route Plan View, 3 of 7

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- ROW
- Overland Transmission Line
- Bridge
- Culvert
- Project Features
- Cut and Fill Footprint
- Mechanized Land Clearing
- Wetlands Mapping Area
- Wetlands/Waters (HDR)
- Streams (HDR)
- 10ft Contour
- Hydro Reserve Boundary*
- \+ Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 7 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG05-11_PLANVIEW_MPBK.MXD - USER: CBRISBOIS - DATE: 11/23/2021

Access Route Plan View, 4 of 7

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- ROW
- Overland Transmission Line
- Bridge
- Culvert
- Project Features
- Cut and Fill Footprint
- Mechanized Land Clearing
- Wetlands Mapping Area
- Wetlands/Waters (HDR)
- Streams (HDR)
- 10ft Contour
- Hydro Reserve Boundary*
- + Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

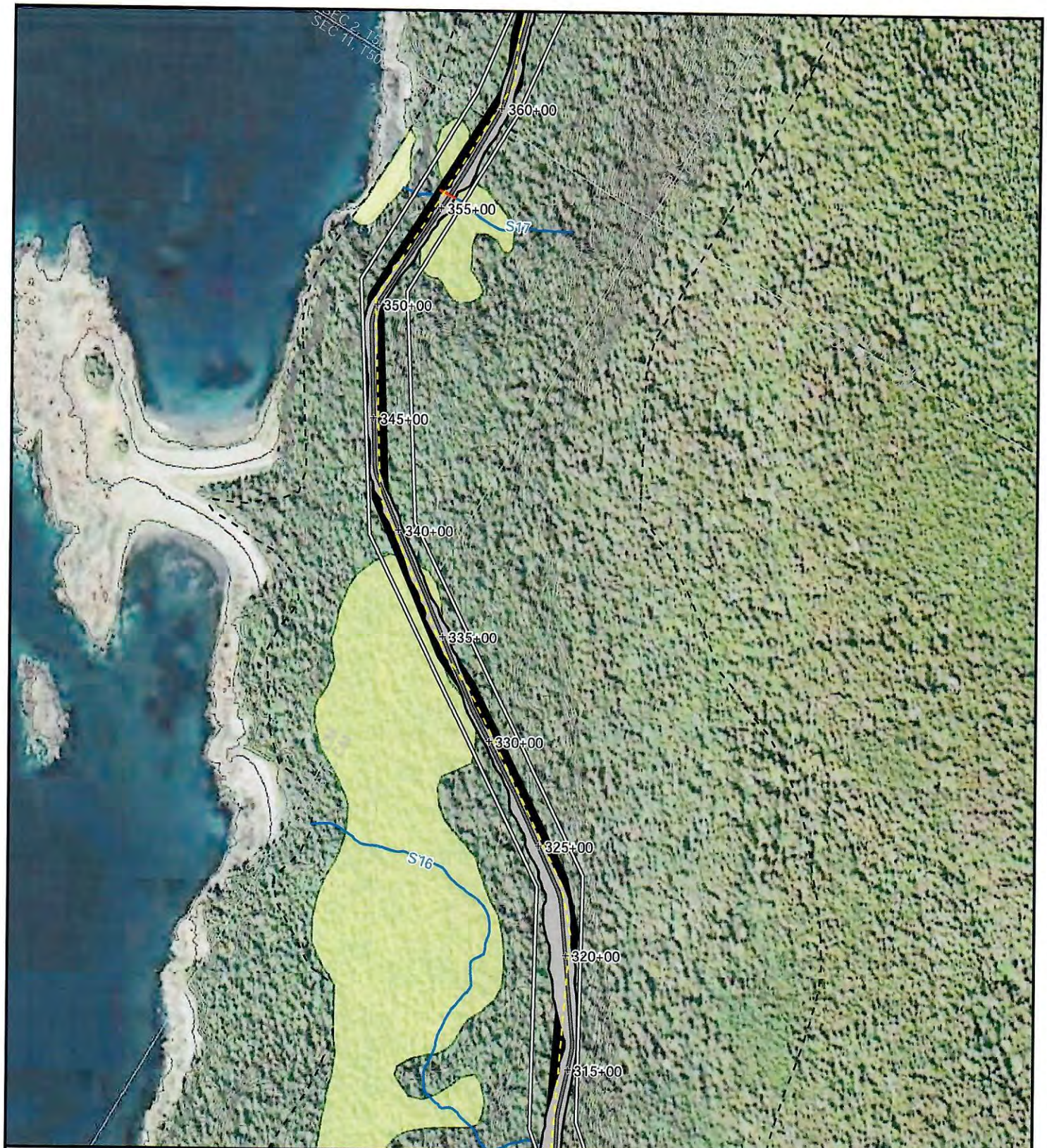
WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGUR E 8 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG05-11_PLANVIEW_MPBK.MXD - USER: CBRISBOIS - DATE: 11/23/2021



Access Route Plan View, 5 of 7

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

- ROW
- Overland Transmission Line
- Culvert
- Project Features
- Cut and Fill Footprint
- Mechanized Land Clearing
- Wetlands Mapping Area
- Wetlands/Waters (HDR)
- Streams (HDR)
- 10ft Contour
- \+ Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

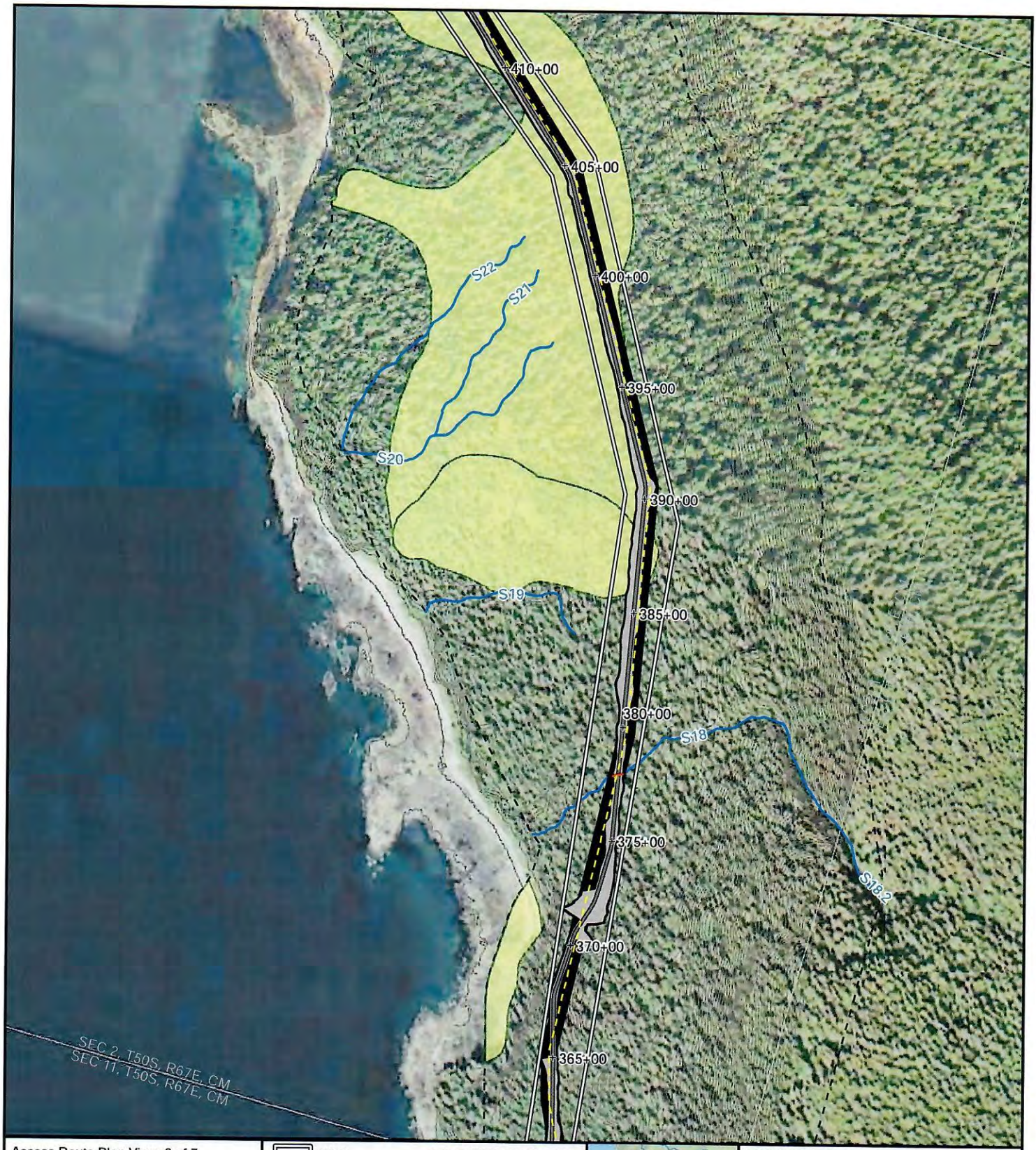
WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 9 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG05-11_PLANVIEW_MPBK.MXD - USER: CBRISBOIS - DATE: 11/23/2021



Access Route Plan View, 6 of 7

Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

ROW
Overland Transmission Line
Culvert
Project Features
Cut and Fill Footprint
Mechanized Land Clearing
Wetlands Mapping Area
Wetlands/Waters (HDR)
Streams (HDR)
10ft Contour
+ Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

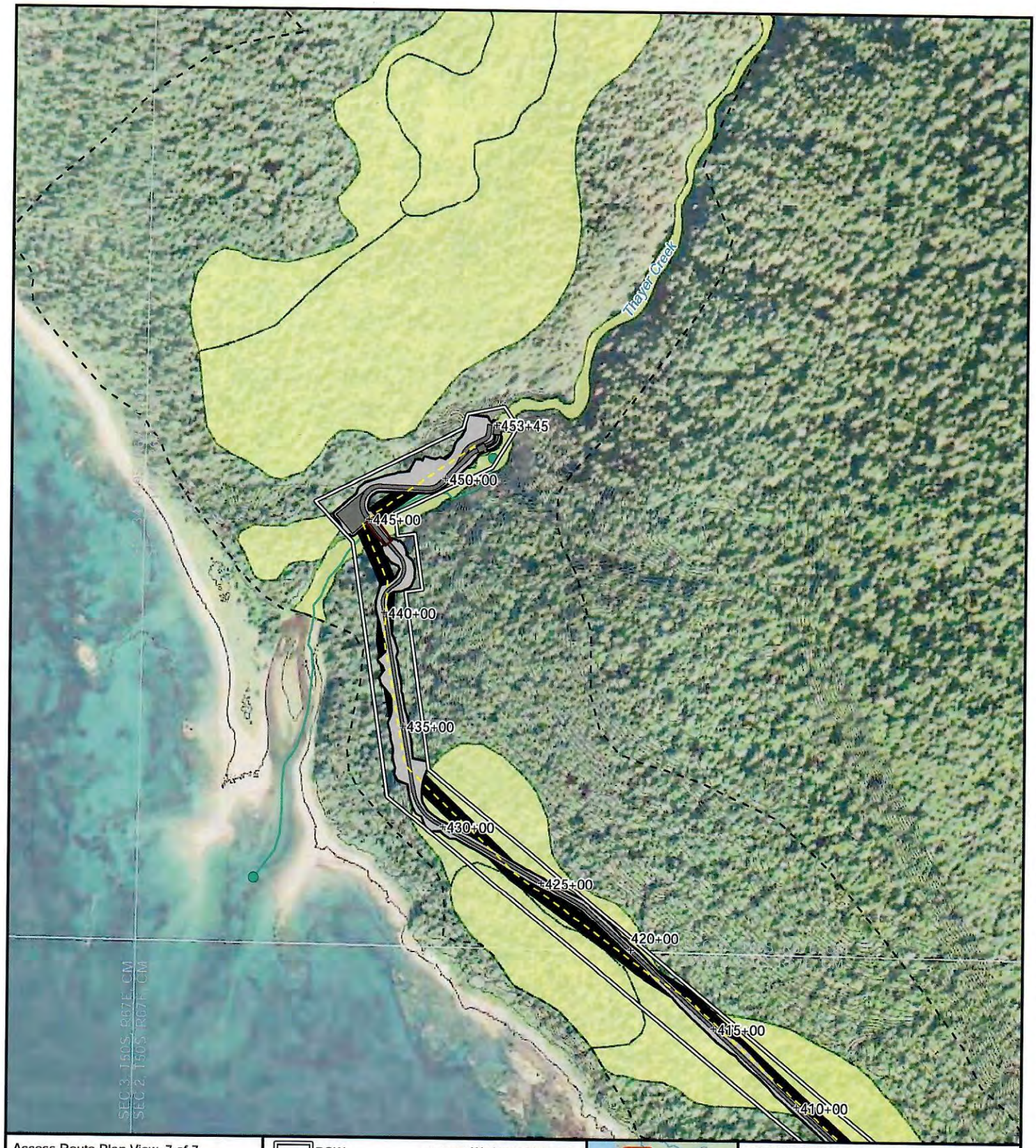
WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 10 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG05-11_PLANVIEW_MPBK.MXD - USER: CBRISBOIS - DATE: 11/23/2021



Access Route Plan View, 7 of 7

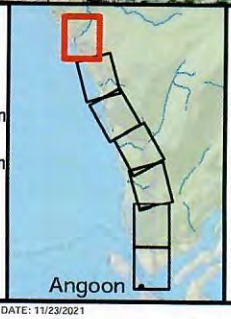
Thayer Creek
Hydroelectric Project

*per ANILCA Section 506(a)(1)(B)

0 262.5 525 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

ROW
Overland Transmission Line
Bridge
Project Features
Cut and Fill Footprint
Mechanized Land Clearing
Wetlands Mapping Area
Wetlands/Waters (HDR)
Anadromous Stream Point
Anadromous Stream
10ft Contour
+ Stationing



APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

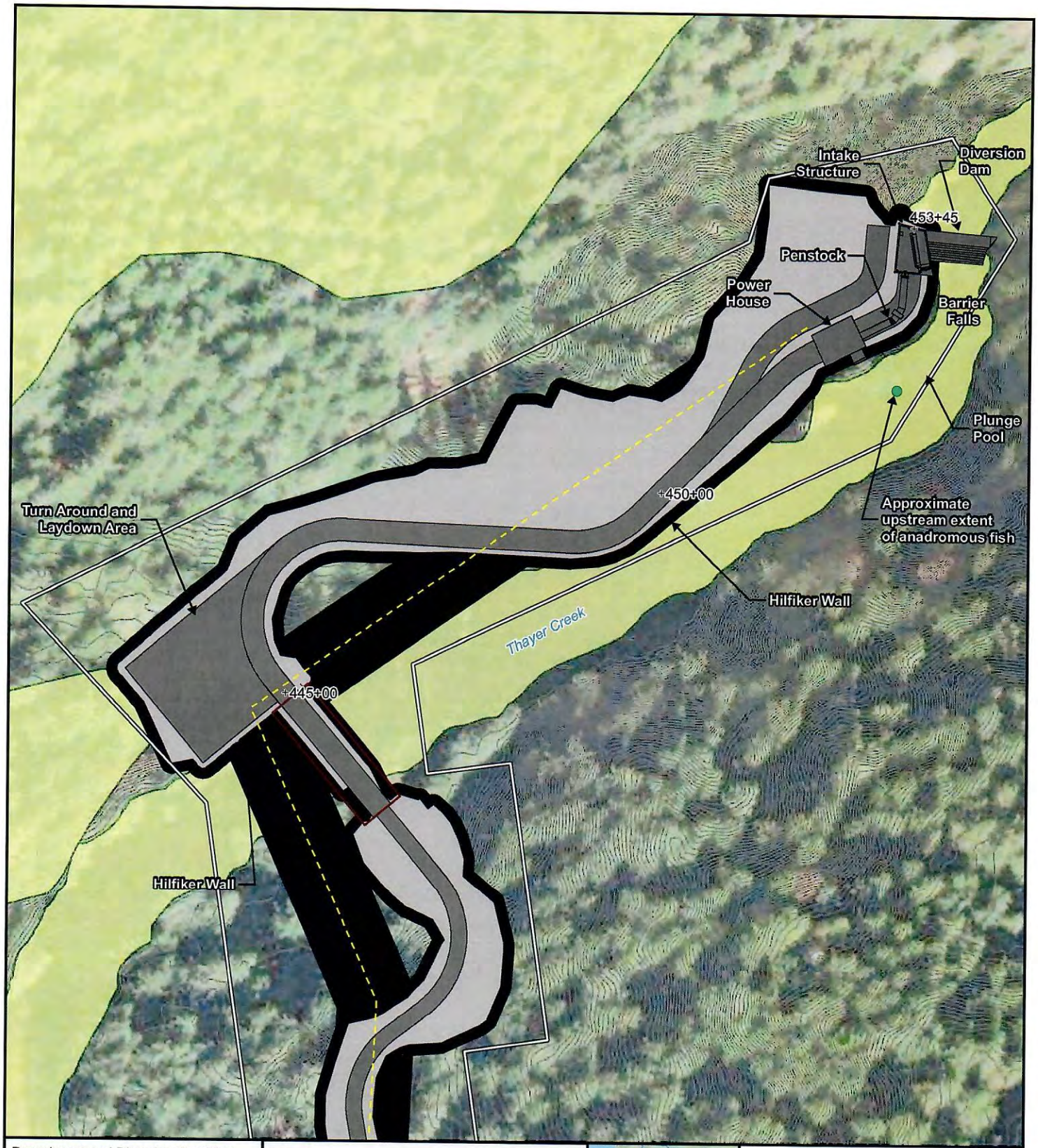
WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 11 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG05-11_PLANVIEW_MPBK.MXD - USER: CBRISBOIS - DATE: 11/23/2021



Powerhouse and Diversion Plan View

Thayer Creek
Hydroelectric Project

0 50 100 Feet

HORIZONTAL DATUM:
NAD 1983, State Plane Zone 1

ROW
Overland Transmission Line
Bridge
Project Features
Cut and Fill Footprint
Mechanized Land Clearing
Wetlands/Waters (HDR)
Anadromous Stream Point
2ft Contour
+ Stationing

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

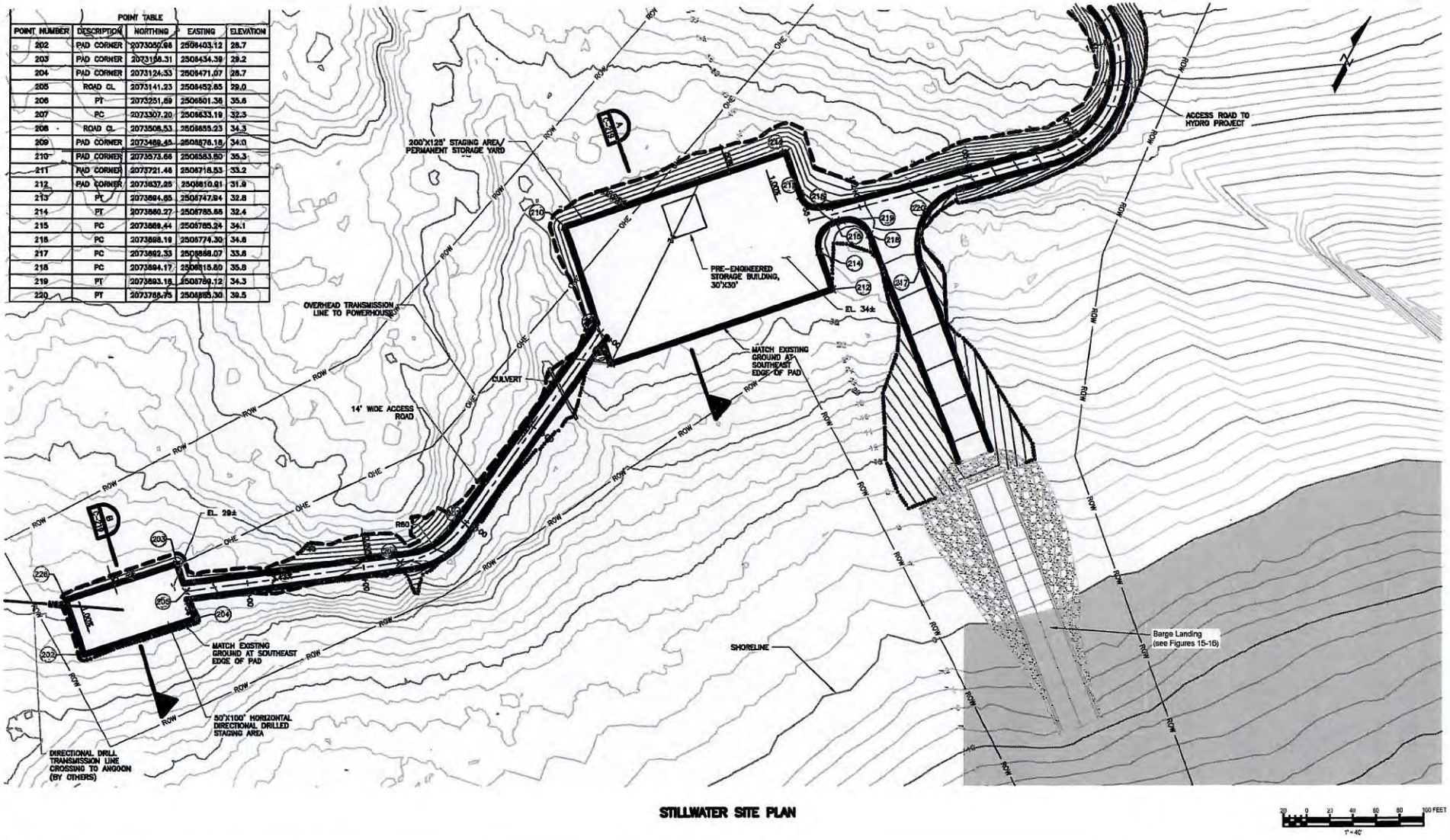
WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 12 of 29

DATE: 11/24/2021

PATH: \\ANC-SRV04\PROJECT_SAN\10174531_THAYERCRKHYDRODESIGN\7.2_WP\MAP_DOCS\PERMIT_404\FIG12_PLANVIEW_POWERHOUSE.MXD - USER: CBRISBOIS - DATE: 11/23/2021



STILLWATER SITE PLAN

HDD Staging Area and Permanent Storage Yard

Site Plan Details

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

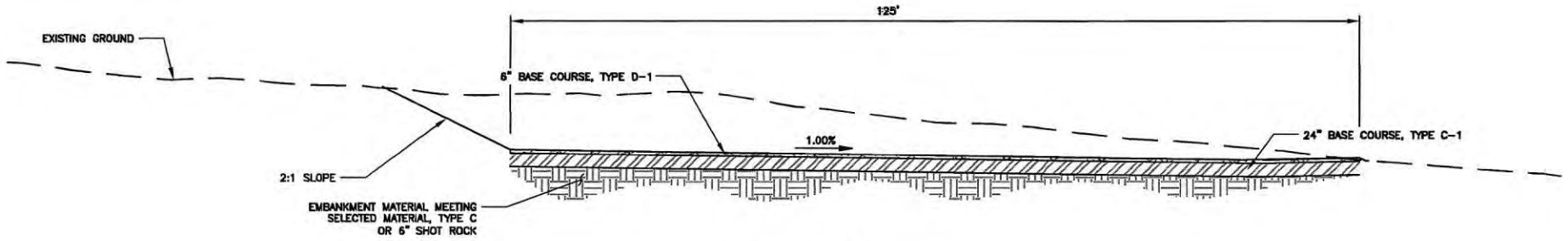
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

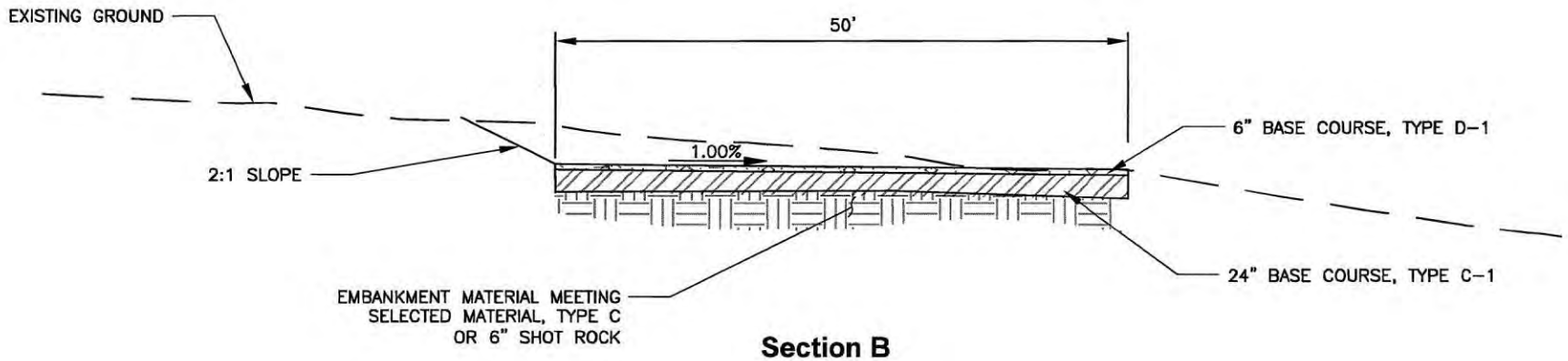
LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 13 of 29

DATE: 11/24/2021



Section A



Section B

HDD Staging Area and Permanent Storage Yard

Grading Details Cross Sections A & B

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

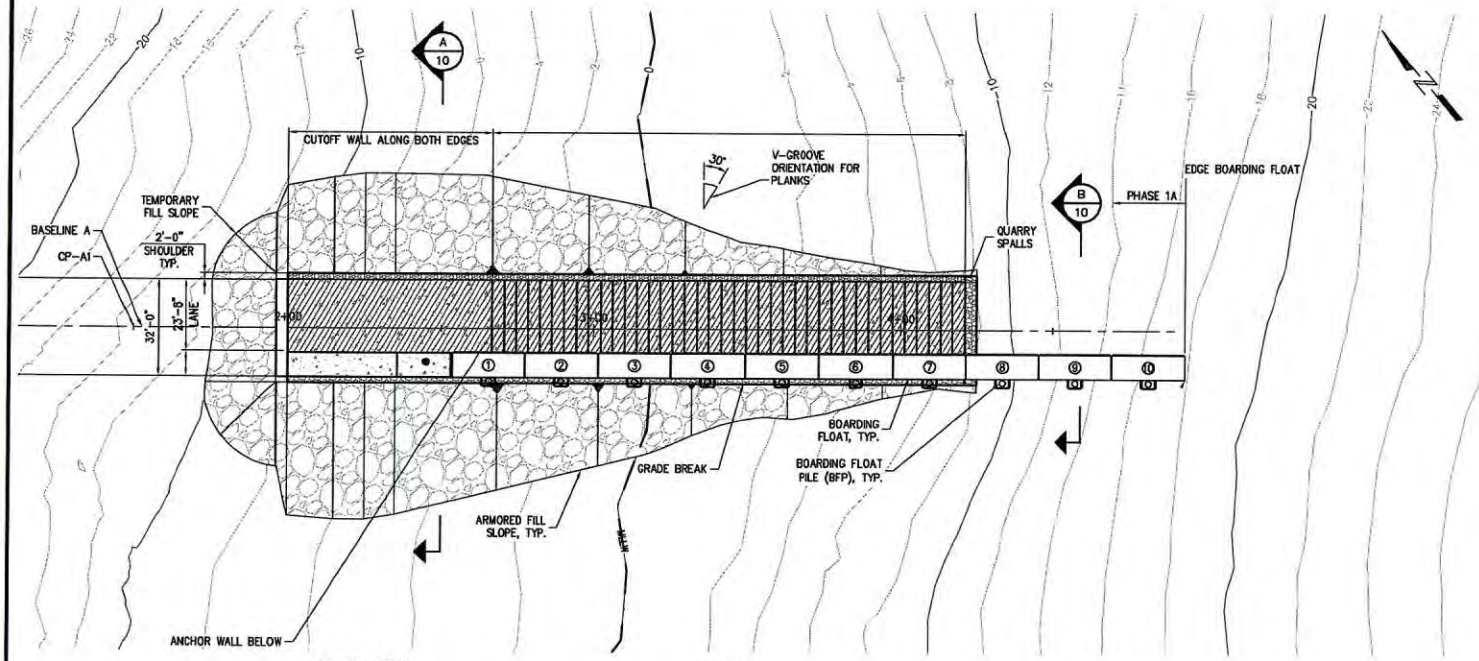
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

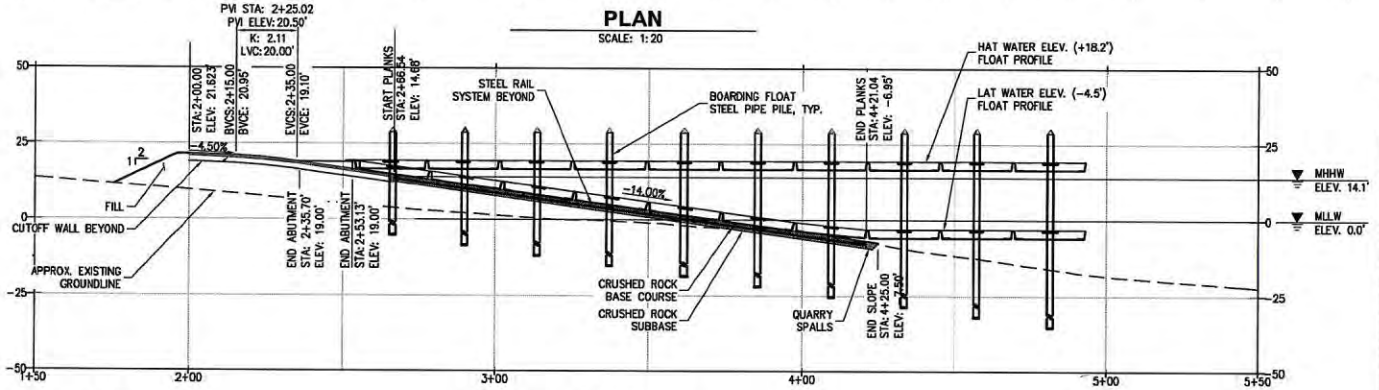
FIGURE 14 of 29

DATE: 11/24/2021



PLAN

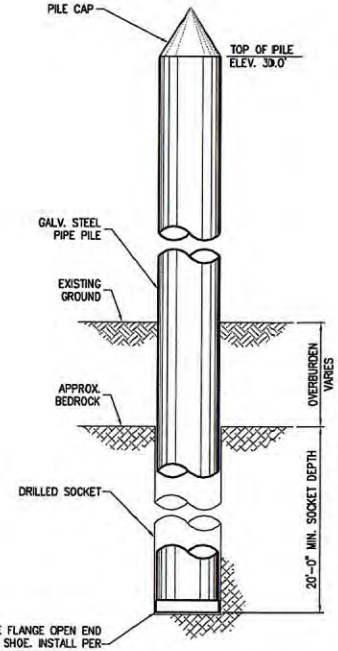
SCALE: 1:20



NOTE:
FLOATS AND PILES SHOWN FOR REFERENCE ONLY AND ARE ACTUALLY IN FOREGROUND

PROFILE

SCALE: 1:20



FLOAT PILE INSTALLATION

FLOAT PILE SCHEDULE

PILE DESIGNATION	STATION	SIZE
BFP1	2+66.37	24"x0.625"
BFP2	2+90.29	24"x0.625"
BFP3	3+14.21	24"x0.625"
BFP4	3+38.12	24"x0.625"
BFP5	3+62.04	24"x0.625"
BFP6	3+85.96	24"x0.625"
BFP7	4+09.88	24"x1.000"
BFP8	4+33.79	24"x1.000"
BFP9	4+57.71	24"x1.000"
BFP10	4+81.63	24"x1.000"

LEGEND

- (#) FLOAT UNIT NUMBER
- CP-X CONTROL POINT
- QUARRY SPALLS
- NEW CONCRETE
- GRAVEL SURFACING

100% ISSUED FOR REVIEW

Barge Landing and Small Boat Boarding Float

Plan & Profile

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

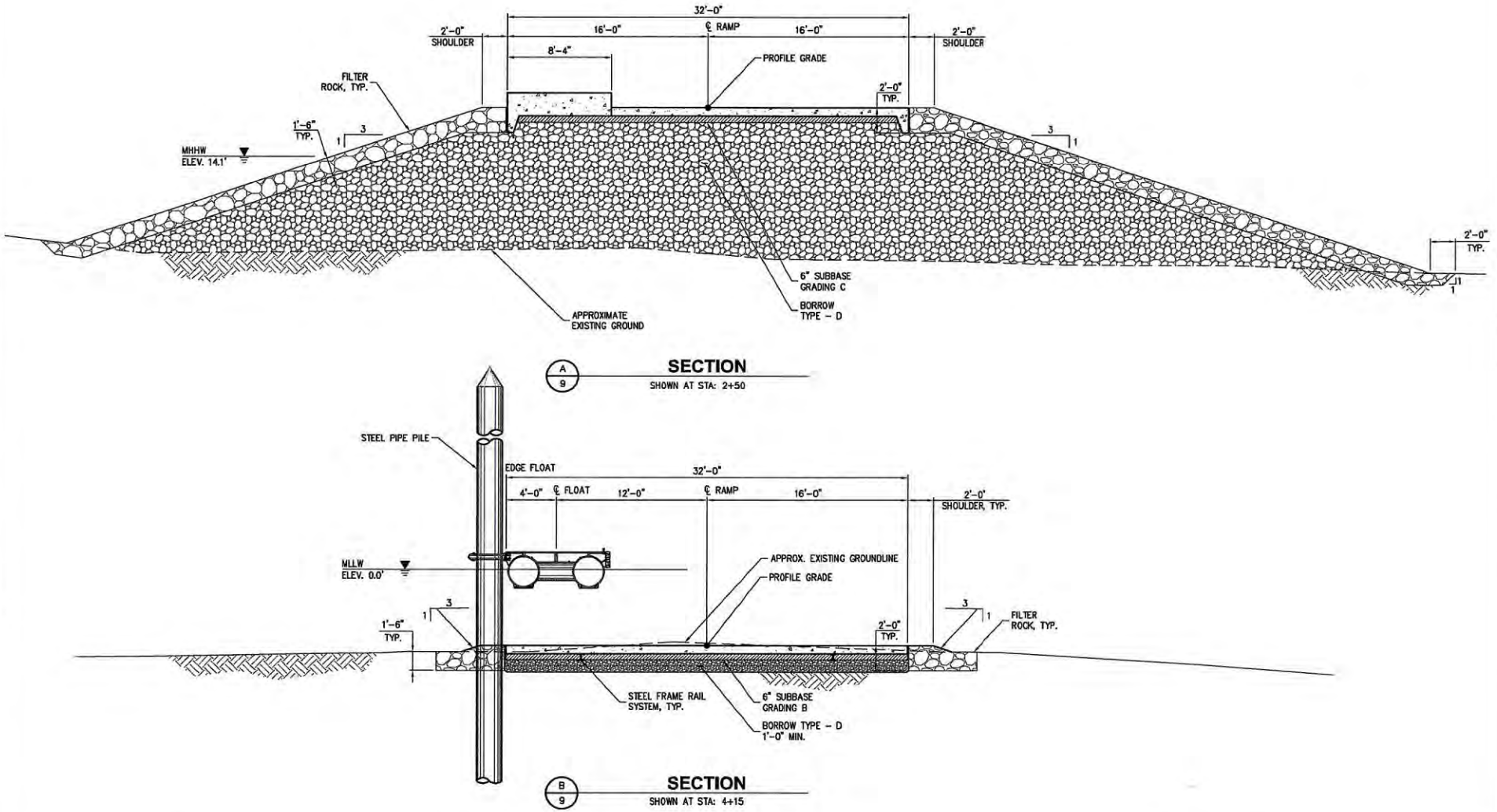
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 15 of 29

DATE: 11/24/2021



Barge Landing and Small Boat Boarding Float

Cross Sections

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

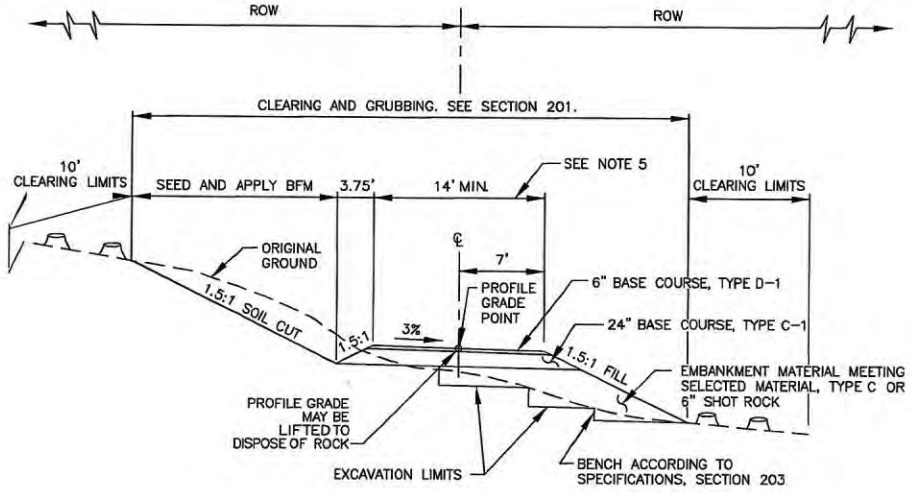
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

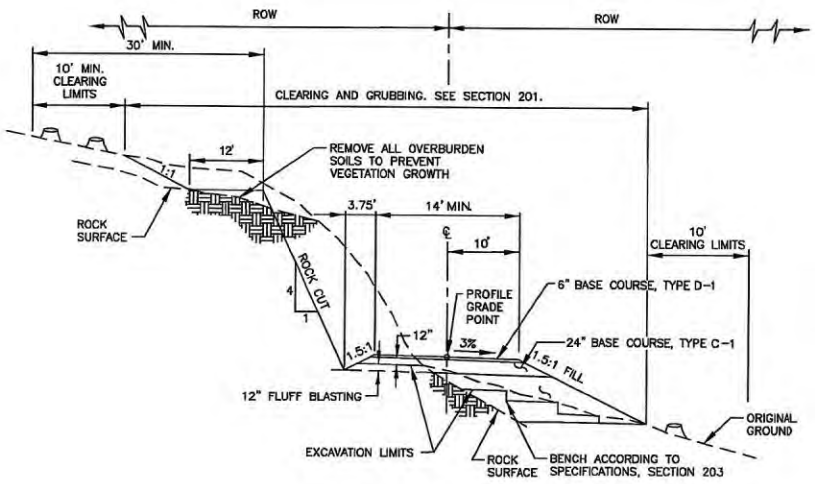
LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 16 of 29

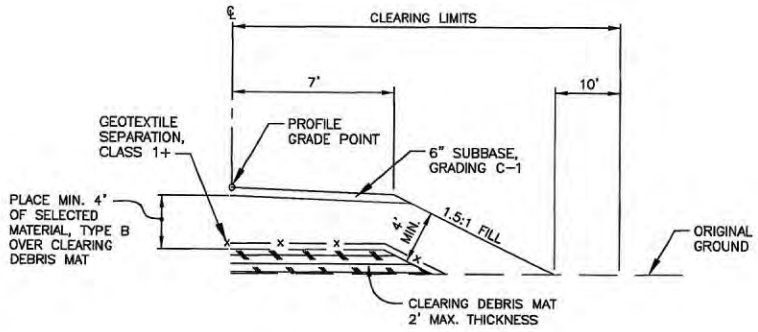
DATE: 11/24/2021



TYPICAL SOIL CUT

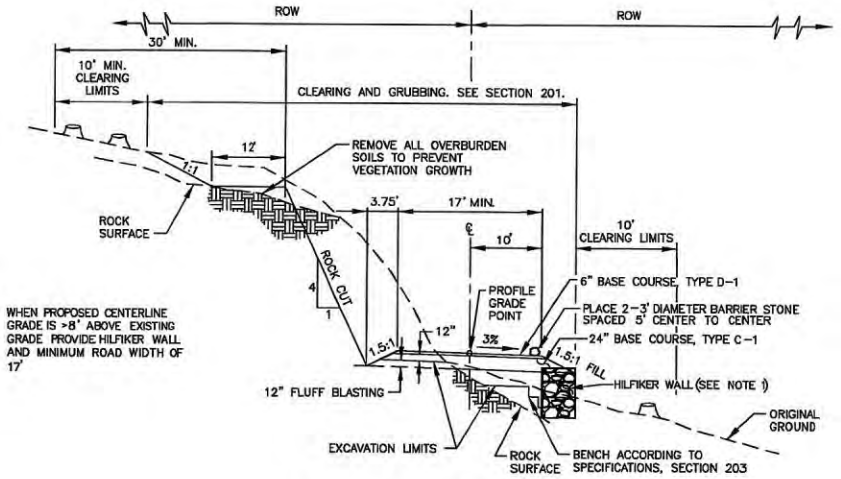


TYPICAL ROCK SECTION



SOFT GROUND CONSTRUCTION DETAIL

SOFT GROUND IS DEFINED AS HAVING A CALIFORNIA BEARING RATIO (CBR) < 3



TYPICAL HILFIKER WALL SECTION

Typical Soil Cut & Soft Ground Construction Detail

Typical Rock & Hilfiker Wall Cross Sections

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

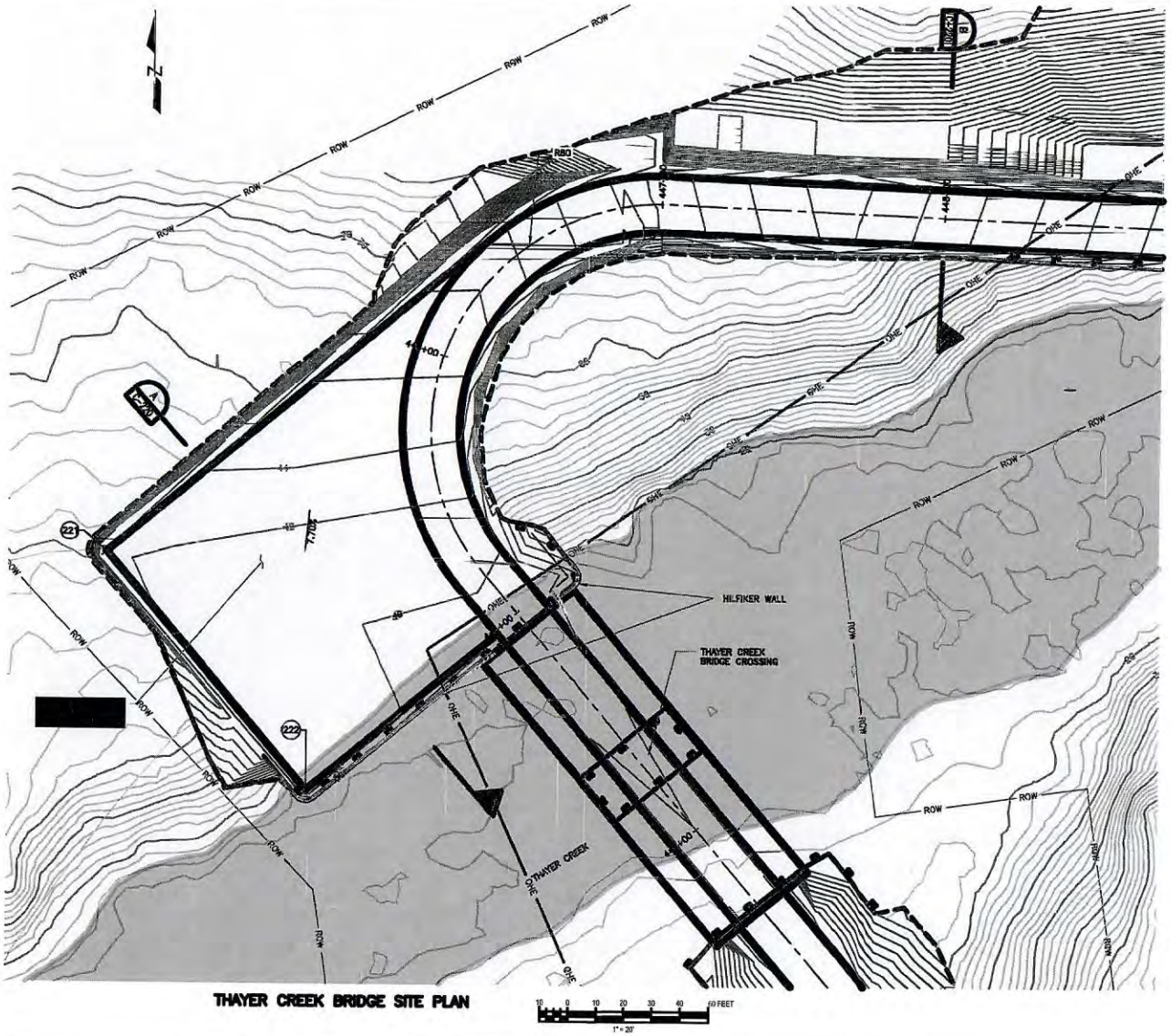
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 17 of 29

DATE: 11/24/2021



THAYER CREEK BRIDGE SITE PLAN

Thayer Creek Bridge Site Plan

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

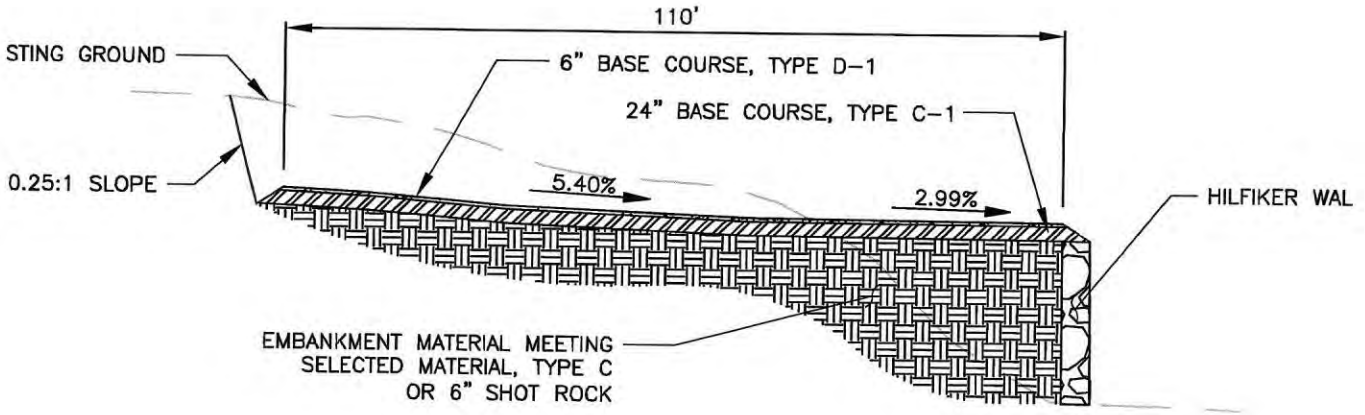
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

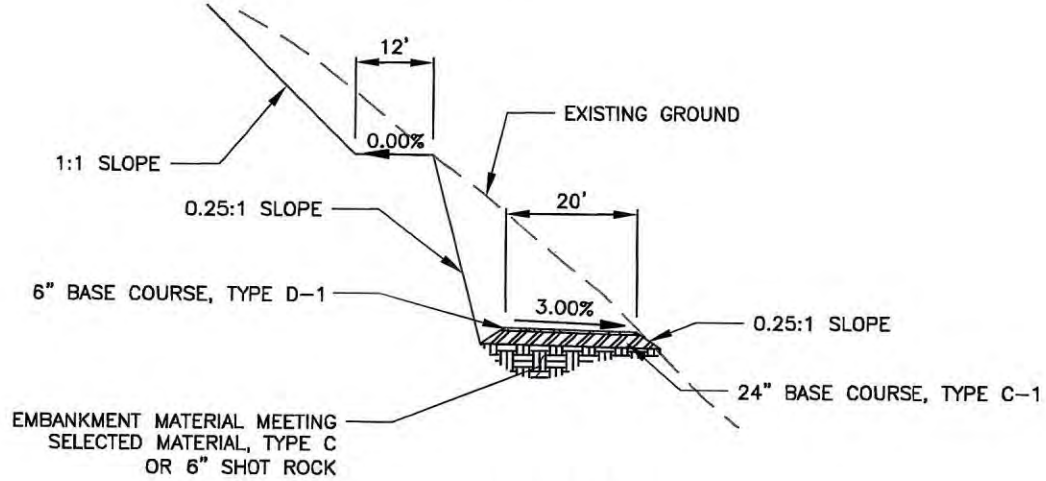
LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 18 of 29

DATE: 11/24/2021



Section A



Section B

Thayer Creek Bridge Crossing

Grading Details Cross Sections A & B

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

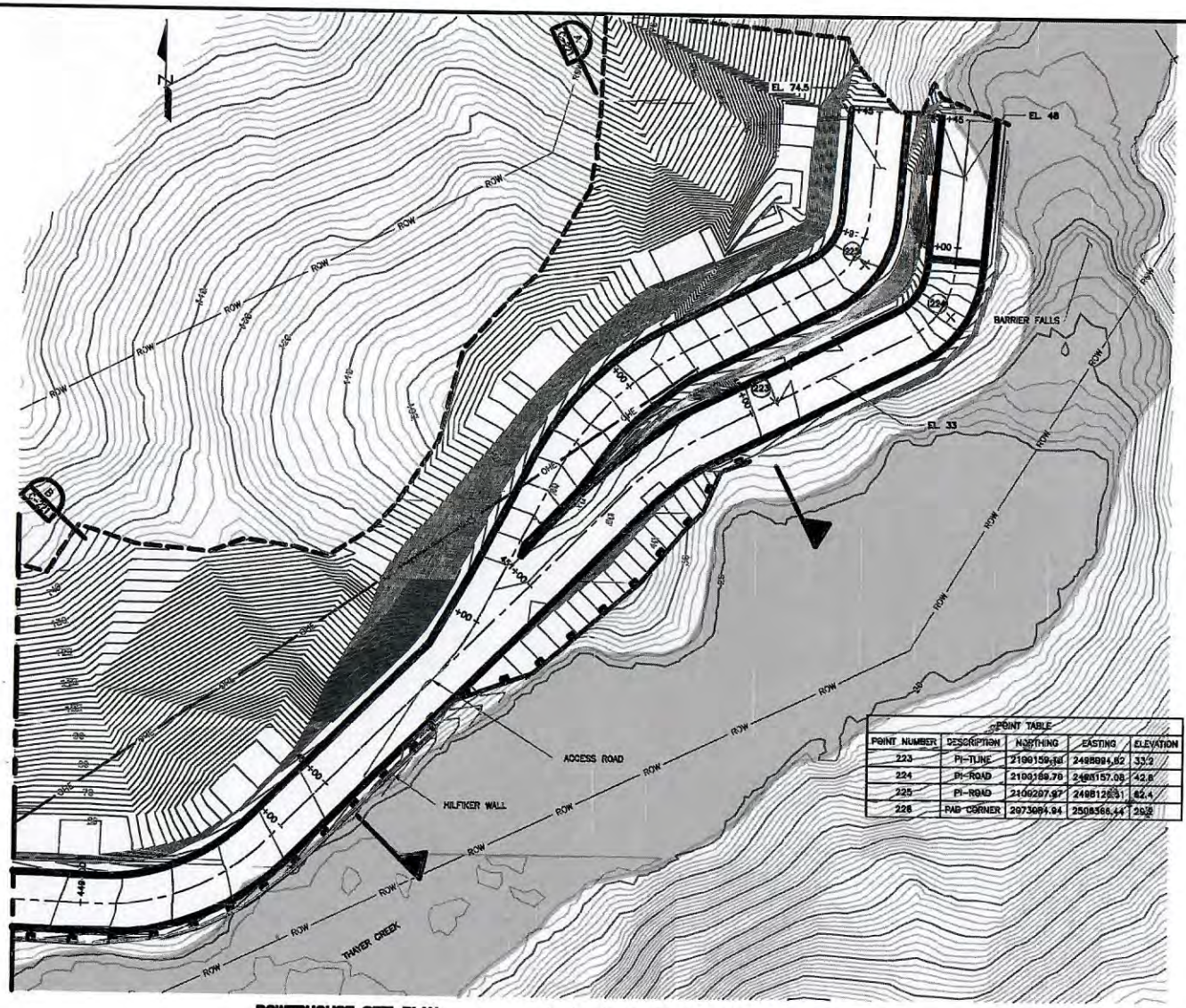
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 19 of 29

DATE: 11/24/2021



POWERHOUSE SITE PLAN

10 0 10 20 30 40 60 FEET
1" = 98'

Powerhouse Site Plan

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

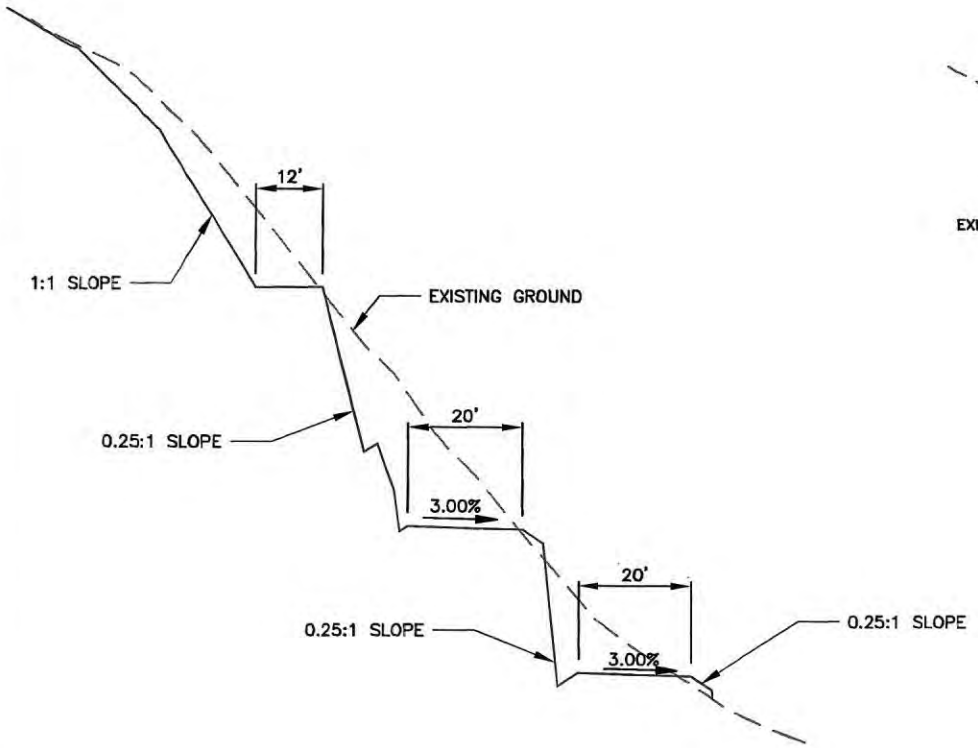
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

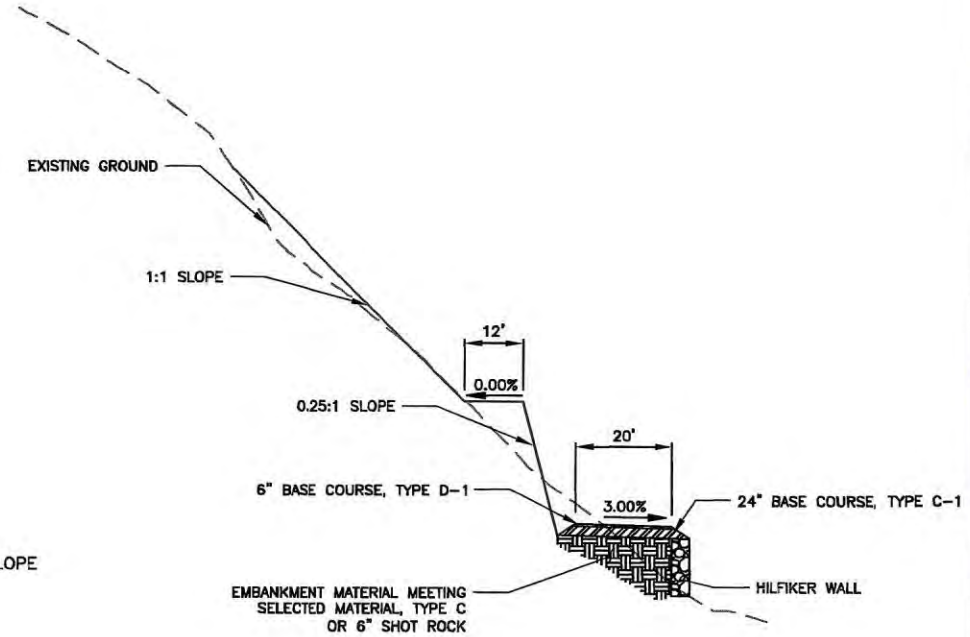
LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 20 of 29

DATE: 11/24/2021



Section A



Section B

Powerhouse

Grading Details Cross Sections A & B

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

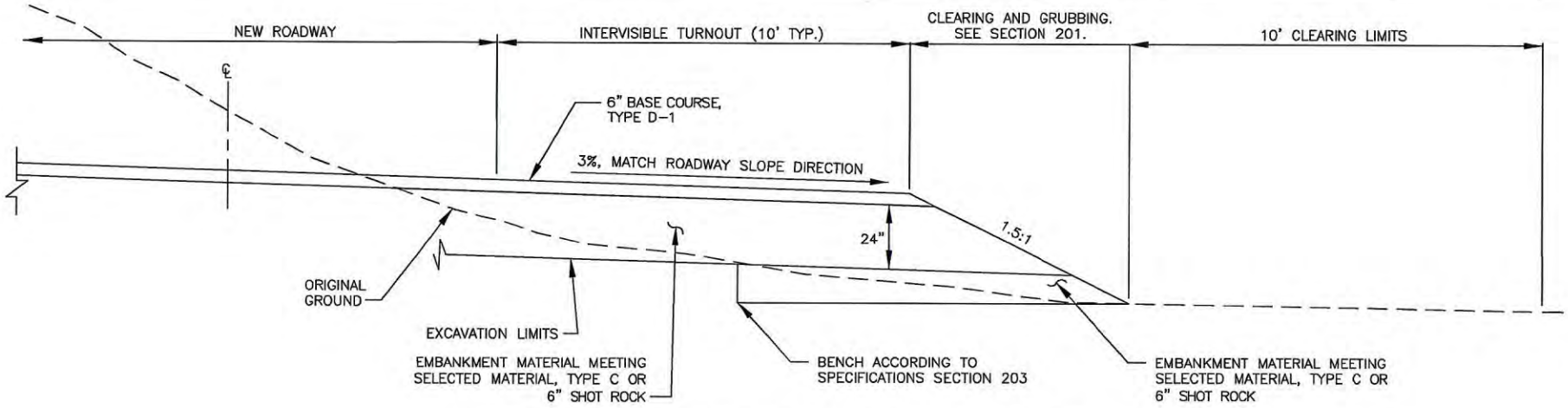
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

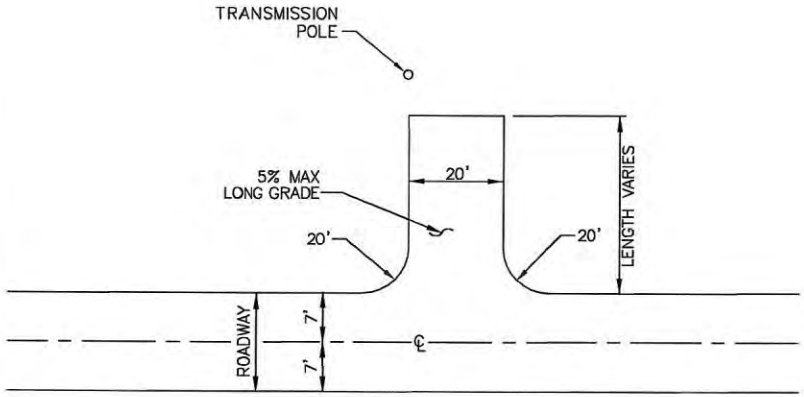
FIGURE 21 of 29

DATE: 11/24/2021

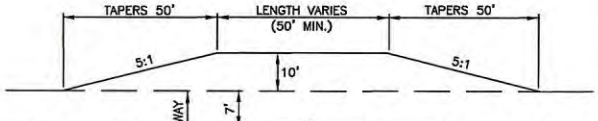


INTERVISIBLE TURNOUT TYPICAL SECTION

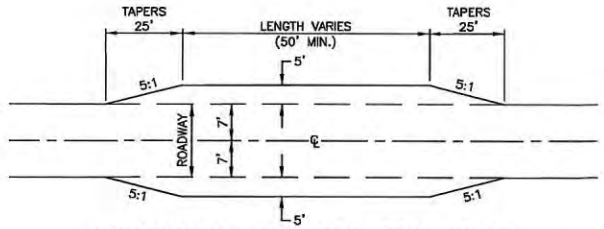
NTS



SPUR ROAD DETAIL



INTERVISIBLE TURNOUT, ONE SIDE



INTERVISIBLE TURNOUT, TWO SIDES

Intervisible Turnout Typical Cross Section & Details

Spur Road Detail

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

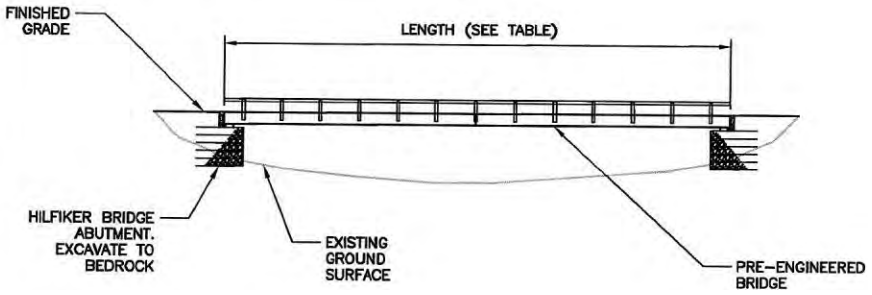
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

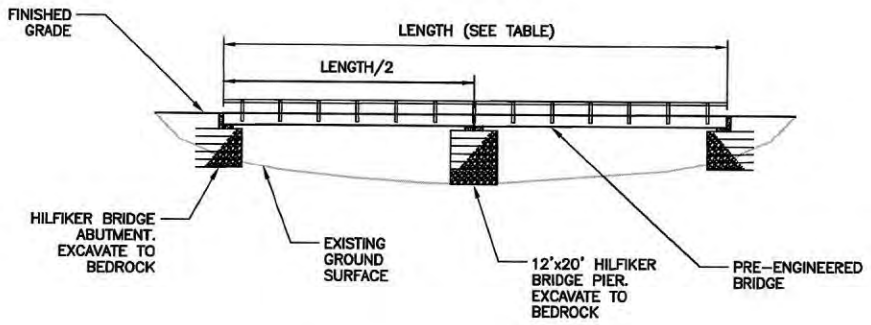
LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 22 of 29

DATE: 11/24/2021



SINGLE SPAN BRIDGE CROSSING



DOUBLE SPAN BRIDGE CROSSING

BRIDGE CROSSING			
STATION	SPAN	ESTIMATED LENGTH	DESCRIPTION
226+44	SINGLE	60'	UNNAMED STREAM (S09)
287+11	SINGLE	60'	UNNAMED STREAM (S13)
292+50	SINGLE	60'	UNNAMED STREAM
445+00	DOUBLE	130'	THAYER CREEK

Typical Bridge Crossing Details

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

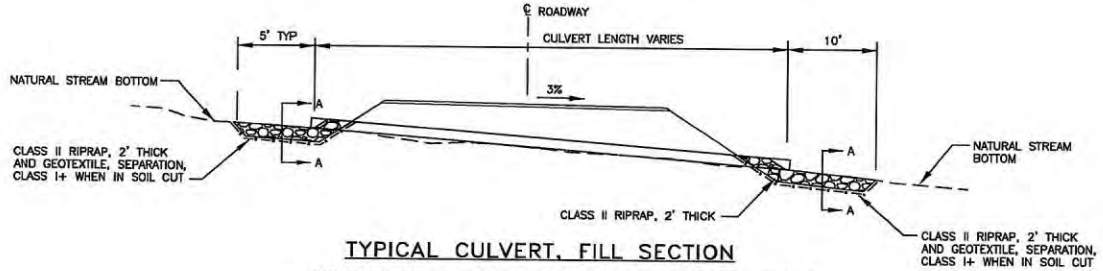
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

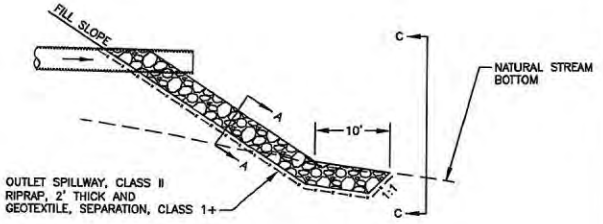
FIGURE 23 of 29

DATE: 11/24/2021

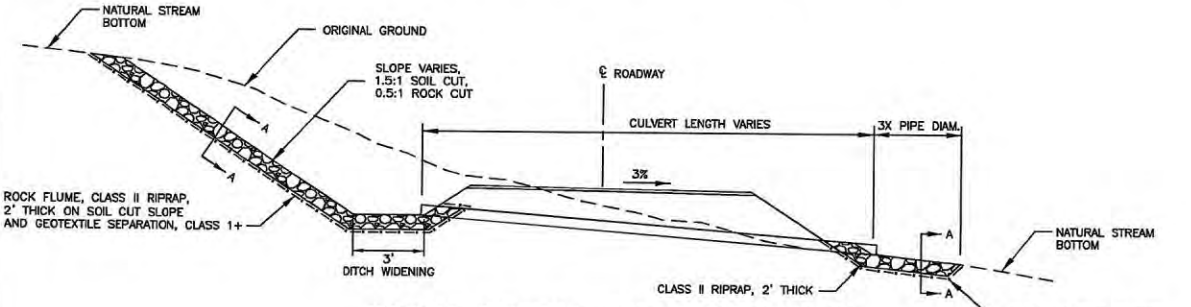


TYPICAL CULVERT, FILL SECTION

1. ALIGN THE CULVERT WITH THE NATURAL CHANNEL AND MATCH THE STREAM GRADIENT.
2. UNLESS DIRECTED OTHERWISE, WHEN THE STREAM GRADIENT EXCEEDS 15%, FLATTEN THE CULVERT SLOPE TO 3% AND CONSTRUCT A RIPRAP SPILLWAY AT THE CULVERT OUTLET.

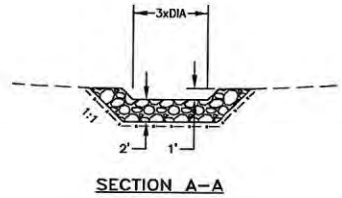


CULVERT OUTLET SPILLWAY DETAIL

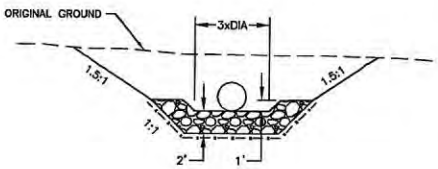


TYPICAL CULVERT, CUT – FILL SECTION

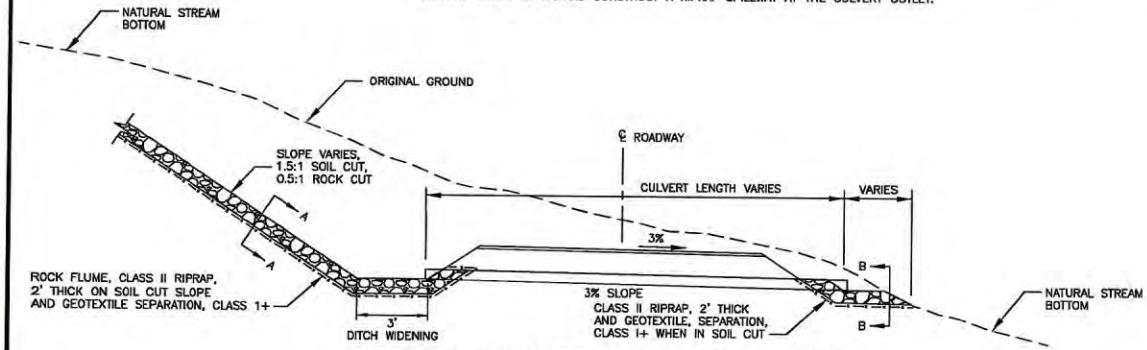
1. ALIGN THE CULVERT WITH THE NATURAL CHANNEL.
2. UNLESS DIRECTED OTHERWISE, WHEN THE CULVERT SLOPE EXCEEDS 15%, FLATTEN THE CULVERT SLOPE TO 3% AND CONSTRUCT A RIPRAP SPILLWAY AT THE CULVERT OUTLET.



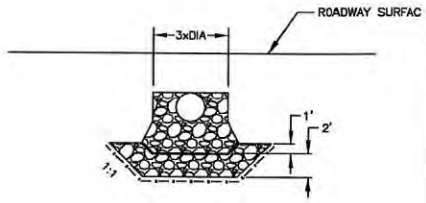
SECTION A–A



SECTION B–B



TYPICAL CULVERT, THRU CUT SECTION



SECTION C–C

Typical Culvert Details and Sections

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

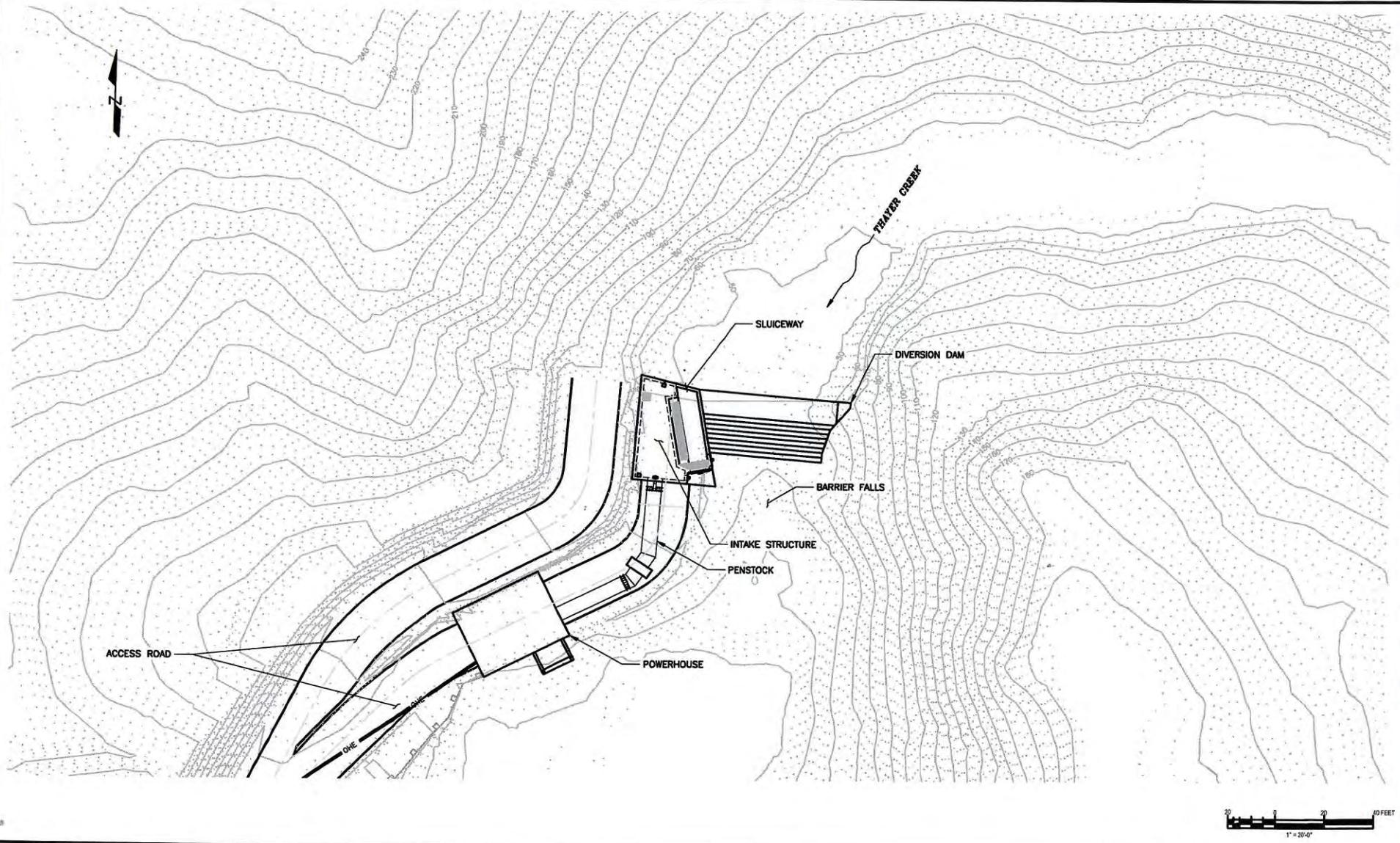
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 24 of 29

DATE: 11/24/2021



Powerhouse, Intake Structure & Diversion Dam Site Plan

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

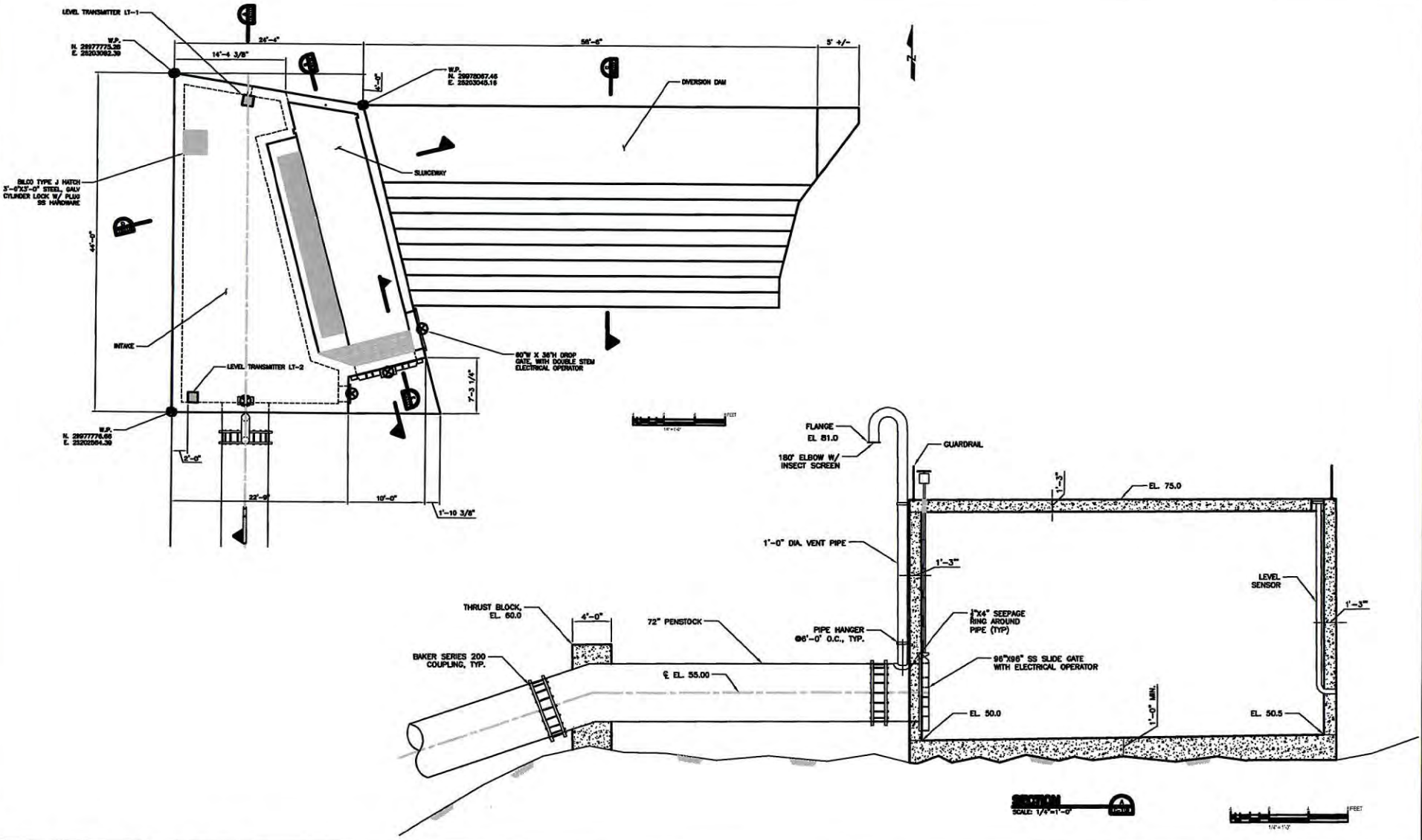
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 25 of 29

DATE: 11/24/2021



Diversion Plan & Intake Cross Section A

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

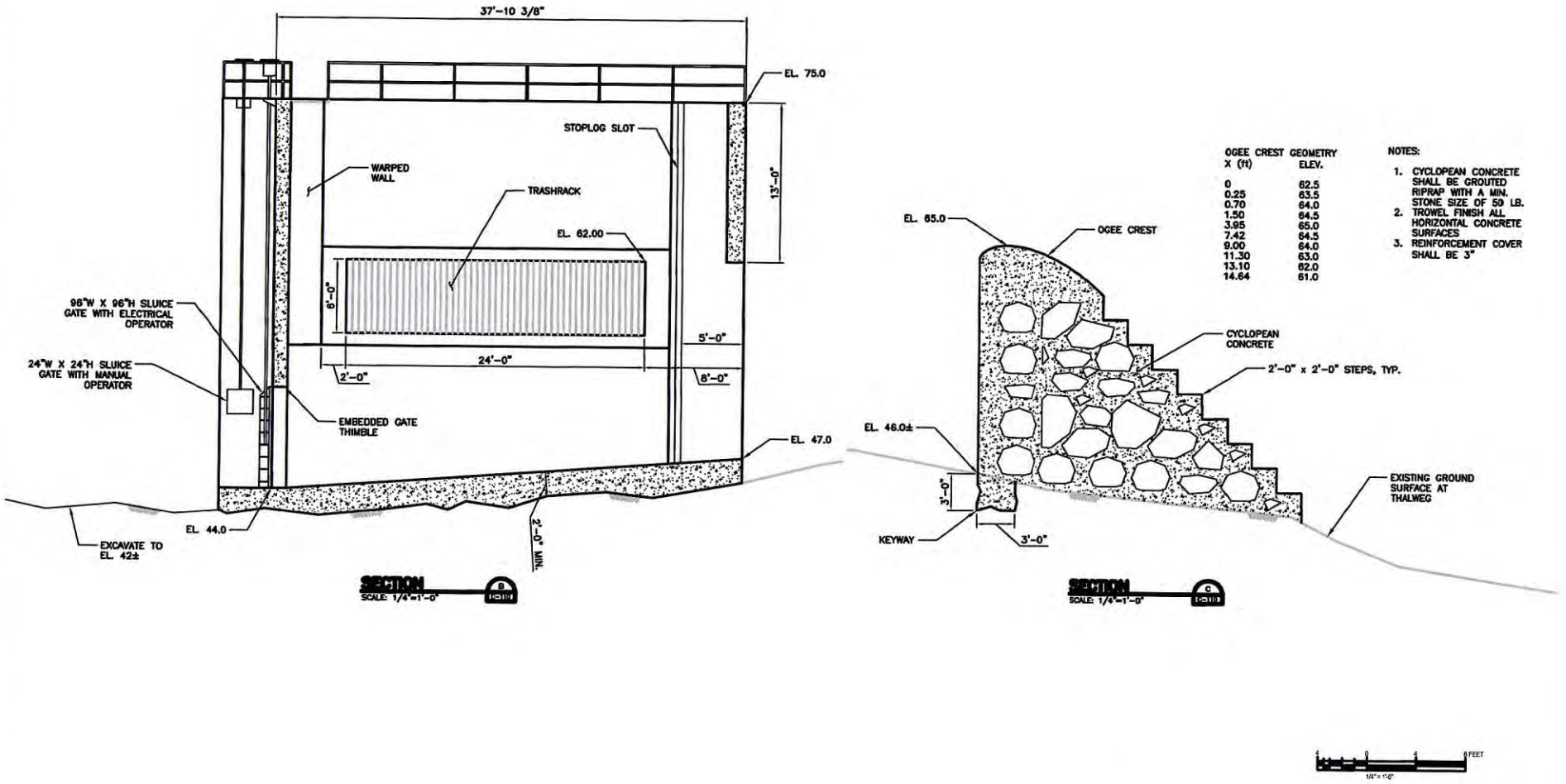
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 26 of 29

DATE: 11/24/2021



OGEE CREST GEOMETRY

X (ft)	ELEV.
0	62.5
0.25	63.5
0.70	64.0
1.50	64.5
3.95	65.0
7.42	64.5
9.00	64.0
11.30	63.0
13.10	62.0
14.64	61.0

NOTES:

1. CYCLOPEAN CONCRETE SHALL BE GROUTED RIPRAP WITH A MIN. STONE SIZE OF 50 LB.
2. TROWEL FINISH ALL HORIZONTAL CONCRETE SURFACES
3. REINFORCEMENT COVER SHALL BE 3"

Sluiceway & Dam Cross Sections B & C

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

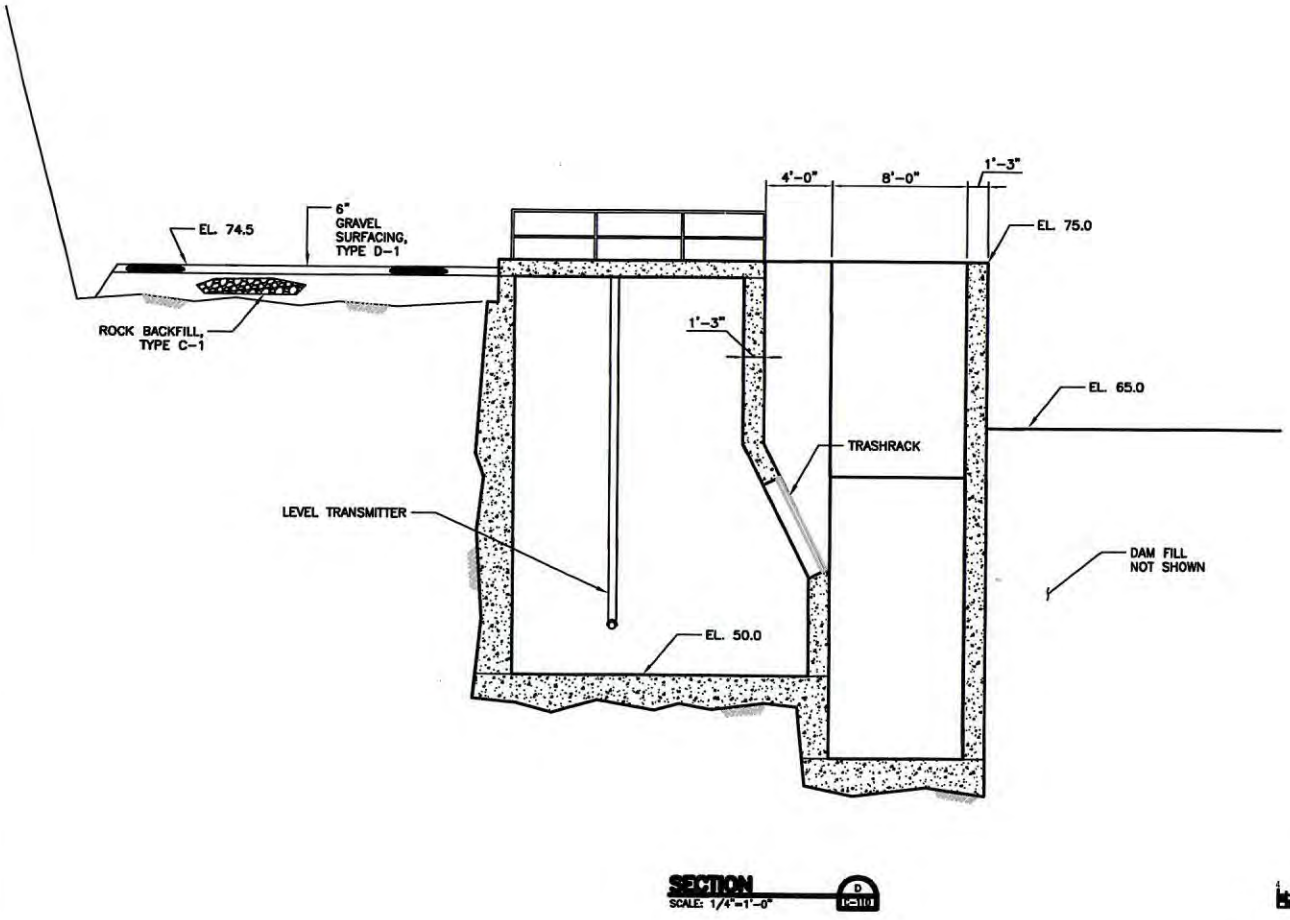
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 27 of 29

DATE: 11/24/2021



Sluiceway & Intake Cross Sections D & E

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

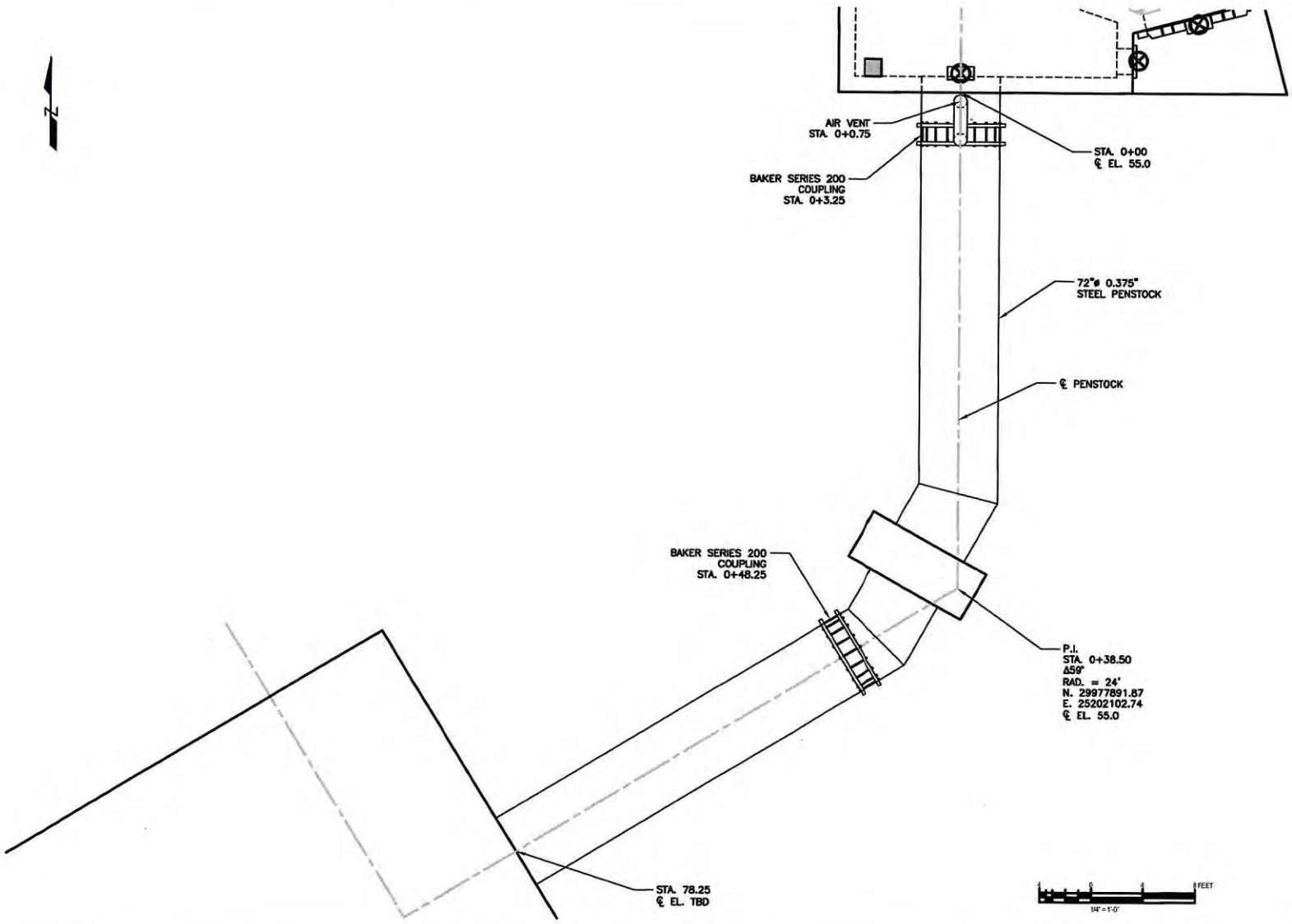
FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 28 of 29

DATE: 11/24/2021



Penstock Site Plan

Thayer Creek
Hydroelectric Project

APPLICANT: Kootznoowoo, Inc.

FILE NO: POA-2001-00086

WATERWAY: Thayer Creek

LOCATION: Copper River Meridian: T49S, R67E, S35, T50S, R67E, S2,11,12,13,24,25, R68E, S30

FIGURE 29 of 29

DATE: 11/24/2021