**US Army Corps
of Engineers
Alaska District**

ANCHORAGE
Regulatory Division (1145)
CEPOA-RD
Post Office Box 6898
JBER, Alaska 99506-0898

Public Notice of Application for Permit

PUBLIC NOTICE DATE:	**July 31, 2020**
EXPIRATION DATE:	**August 31, 2020**
REFERENCE NUMBER:	**POA-2018-00123**
WATERWAY:	**Bonanza Channel/ Safety Sound**

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

All comments regarding this Public Notice (PN) 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 or to regpagemaster@usace.army.mil. 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 PN to become part of the record and be considered in the decision. Please contact Leslie Tose at (907) 753-5515, toll free from within Alaska at (800) 478-2712, by fax at (907) 753-5567, or by email at: Leslie.W.Tose@usace.army.mil@usace.army.mil if further information is desired concerning this notice.

APPLICANT: IPOP, L.L.C, attn. Beau Epstein, 9811 W. Charleston Blvd, #2-444, Las Vegas, NV 89117, Phone: 1-702-460-2675, Email: beau@ecological-restoration.org

AGENT: Yukuskokon Professional Services, Attention: Mr. William Burnett, P.O. Box 870507, Wasilla, AK 99687 U.S.A, Phone: 907-373-4000, Email: billburnett@yukuskokon.com

LOCATION: The project site is located between Latitude 64.5044 N., Longitude 164. 6169 W. on the west limit, and Latitude 64.5694 N., Longitude 164.2671 W. on the east limit, approximately 25 miles east of Nome, Alaska.

SPECIAL AREA DESIGNATION: The project abuts the Bering Sea units of the National Maritime Wildlife Refuge.

PURPOSE: To economically produce gold from IPOP's mining claims on the Bonanza Channel/ Safety Sound area near Nome, Alaska.

PROPOSED WORK: Discharge 4,973,992 cubic yards of material into 172.7 acres of waters of the U.S. (WOTUS) (over 5 years) to construct and maintain an access channel, dredge disposal areas, mining channel, and a mine camp and staging area in approximately 4 acres of uplands. The mine site would be accessed by a dredged channel (dimensions 2,150-4,500 feet (')-long x 85' wide by 10' deep, 4.2 acres in size) that would be maintained and/or re-established annually. Dredged material would be placed into one of four dredge disposal areas (64.3 acres, total). The 5 year mine plan calls for mining 21.7 acres per year from a continuous trench (dimensions per year: 1240' long x 400' wide x 31 feet deep). The active mining area would be no more than 15 acres at any one time.

Equipment to be used includes a single engine dredge vessel (dimensions: 45' long x 24' wide) with a 36" diameter Vosta cutterhead, a 10" diameter dredge nozzle, two small tender boats (dimensions 25' long x 12' wide) and a processing barge (dimensions 70' long by 40'wide).

Reclamation would be concurrent with mining, with temporary dredge material disposal sites to be reclaimed by the end of the project. The Applicant's plan is to mine with concurrent reclamation, re-establishing the estuary as close to the original pre-mining extent and depth as possible, with the exception of the access channel through the center of the mining channel what would be left at 10' depth to provide ecological enhancement to the waterway. The Applicant believes that this would improve the area for fish passage and establish an environment where wild eelgrass beds may take root. The Applicant also proposes the creation of new shallow areas that may occasionally be exposed as sand or mudflats, colonized by beneficial microorganisms and could potentially serve as habitat for water birds, shorebirds and seabirds.

The project would be a seasonal summer/fall mining operation (June 1 to November 1) within the waters of the Bonanza Channel/ Safety Sound. During the winter, core drilling (exploration) would occur, once the channel and lagoon have frozen solid. (The core drilling component of the project was authorized by POA-2018-00123, Nationwide Permit # 6, Survey Activities, verified May 4, 2020). The mining project is anticipated to last 10 years.

The Applicant requests that the regulating agencies approve a permit that covers all thirty-two claims without regard to the order in which claims would be mined.

All work would be performed in accordance with the enclosed plans (sheets 1-26), dated July 30, 2020.

ADDITIONAL INFORMATION:

Additional information regarding the proposed mining activities can be found in the *2020 Narrative and Plan of Operations for the Bonanza Channel Placer Project, Nome, Alaska IPOP, LLC*. Please contact the agent at the aforementioned address or email for additional information or hard copies of their prepared materials.

U.S. Army Corps of Engineers (USACE): Nationwide Permit (NWP) 6 authorization for Survey Activities was verified April 5, 2019; Reverified December 5, 2019; 2nd Reverification May 4, 2020. NWPs 18/19 were verified on April 5, 2019 for Minor Dredging and Discharge

Alaska Department of Natural Resources-Division of Mining (ADNR-Mining) Miscellaneous Land Use Permit for Exploration, Suction Dredging and Reclamation. Permit # 2875, issued April 2, 2019

Alaska Department of Fish and Game (ADFG), various Fish Habitat Permits, various dates

Alaska Department of Environmental Conservation (ADEC) Authorization to Discharge, AKG371000, April 1, 2019

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

The language below is quoted directly from the Applicant, using their language:

“This Mitigation Statement is intended to address primarily the impacts of the first five years of operations, as described in IPOP's 2020 Narrative and Plan of Operations for the Bonanza Channel Placer Project, Nome, Alaska ("2020 IPOP Narrative "). Primary impacts come from development of the base camp, access channel, and proposed five-year mining channel as set forth in the plans and the 2020 IPOP Narrative. Given the innovative nature of the mining and reclamation operations, IPOP expects to develop further information as the project expands into the Central and Eastern Project Areas (Page 2 of 26 in the plans).

Avoidance:

1. IPOP has committed to avoiding any chemical processing that would contribute pollutants to waters of the U.S.
2. IPOP will secure all gray water and sewage generated by project operations on land, and remove it weekly.
3. IPOP will avoid any actual eelgrass beds (none have been identified in repeated surveys). IPOP does not propose to avoid all vegetated areas, because most of the vegetation is sparse, and is nearly eradicated every winter by ice scour and other factors.
4. IPOP's camp will avoid any use of or impact on adjacent wetlands.

Minimization:

1. The project will operate primarily within a containment curtain, limiting water quality and other impacts to within the curtained area,
2. IPOP will be mining to a depth of approximately thirty feet to reduce the overall footprint of the project as compared to mining to a shallower depth.
3. IPOP's mining with concurrent reclamation/improvements will decrease the amount of time WOTUS are disturbed before restoration and improvement.

4. IPOP has identified its base camp location and access channel to utilize the shortest available path to the initial mining area from State-owned land.
5. IPOP advised in the 2020 IPOP Narrative (at p. 58) that it proposed to vary the dimensions and depth of the access channel "shallower or narrower as experience dictates". To clarify, IPOP will actively seek to make the channel as narrow and shallow as it can be while allowing access, thereby minimizing impacts.
6. Most equipment will be removed from the water at the end of each summer mining season,
7. Real-time monitoring of water turbidity and fish and wildlife presence will assist in avoiding unplanned impacts.
8. Other best management practices will include safe fuel handling, strict speed limits for vessels, and advanced equipment that minimizes sound and other impacts. The project design includes numerous measures to minimize environmental and other impacts to the resources of the general project area through strict alternatives analysis (Chapter 4 and Exhibit 4 of the 2020 IPOP Narrative.).
9. Applicant will work with USACE throughout the permitting and public review process to identify any other potential measures or alternatives that meet the project need, that are both reasonable and practicable, that create a benefit to the environment.

Compensatory Mitigation:

IPOP does not believe that its project will involve any significant resource losses requiring compensatory mitigation, for several reasons. First, while the project area includes areas fitting the regulatory definitions of "special aquatic areas," insofar as many are vegetated, the Corps' of Engineers (Corps) statement that such areas "are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region" (40 C.F.R. § 230.3(m)) does not appear to be applicable to the Bonanza Channel.

IPOP's summer mining will not involve disruptions of *significant* resources, because the resources are minimal and all effects will be temporary. IPOP notes that the Corps is to place “special emphasis on the persistence and permanence of the effects outlined in those subparts” (40 C.F.R. § 230.10(c)) in evaluating IPOP's permit application, and that suction dredging of the type to be conducted by IPOP has no persistent, permanent effects other than those here designed to improve ecosystem functioning. Those improvements, discussed in further detail below, should remove any need for compensatory mitigation. IPOP also has questions as to whether compensatory mitigation is "practicable" within the meaning of 40 C.F.R. § 230.3(q).2

IPOP recognizes that under current District Guidance, IPOP's placement of material categorized as "fill" in intertidal waters associated with special aquatic sites, is associated with requirements of compensatory mitigation. Unlike most fill applications, however (*e.g.*, extending a runway over wetlands), IPOP proposes to remove and replace existing materials with no net addition of fill, restoring original contours to the extent practicable except for changes intended, after further consultation with fish and wildlife authorities, to improve ecological functioning. For these reasons, there should be no presumption of compensatory mitigation in the Corp's review of the application.”

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.

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 no cultural resources in the permit area or within the vicinity of the permit area. The permit area has been determined to be the footprint of the project, including the camp area. Consultation of the AHRS constitutes the extent of cultural resource investigations by the Corps at this time, and we are otherwise unaware of the presence of such resources. The Corps has made a No Potential to Cause Effects determination for the proposed project. Consultation with the State Historic Preservation Office (SHPO) is not required, however, 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 Steller's eider *(Polysticta stelleri)*, Spectacled eider *(Somateria fischeri),* Polar Bear *(Ursus Maritimus),* Polar Bear Critical Habitat, Beringia bearded seals (*Erignathus barbatus*), Arctic ringed seals (*Phoca hispida*).

We are currently gathering information regarding these species and have yet to make a determination of effect. Should we find that the described activity may affect the species listed above, and/or their designated critical habitat, we will follow the appropriate consultation procedures under section 7 of the Endangered Species Act of 1973 (87 Stat. 844). Any comments the U.S. Fish and Wildlife Service or the National Marine Fisheries Service (NMFS) 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 immature Chum salmon *(Oncorhyncus keta*)

We have determined the described activity may adversely affect EFH in the project area for the species listed above. This PN initiates EFH consultation with the NMFS. Any comments or recommendations they may have concerning EFH will be considered in our final assessment of the described work.

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 PN 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 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 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 U.S. – Section 10 Rivers and Harbors Act 1899 (33 U.S.C. 403).

(X) Discharge dredged or fill material into waters of the U.S. – 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 and a Notice of Application for State Water Quality Certification are enclosed with this Public Notice.

District Commander
U.S. Army, Corps of Engineers

Enclosures

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
Wastewater Discharge Authorization Program (WDAP) / 401 Certification

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WDAP/401 CERTIFICATION
555 CORDOVA STREET
ANCHORAGE, ALASKA 99501-2617
PHONE: (907) 269-6285 | EMAIL: dec-401cert@alaska.gov

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 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 the Department of Environmental Conservation, 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 (PN) Reference Number **POA-2018-00123, Bonanza Channel/ Safety Sound**, serves as application for State Water Quality Certification from the Department of Environmental Conservation.

After reviewing the application, the Department 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. The Department 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 or via email to dec-401cert@alaska.gov by the expiration date of the Corps of Engineer's Public Notice. All comments should include the PN reference number listed above. Mailed comments must be postmarked on or before the expiration date of the public notice.

Disability Reasonable Accommodation Notice

The State of Alaska, Department of Environmental Conservation complies with Title II of the Americans with Disabilities Act of 1990. If you are a person with a disability who may need special accommodation in order to participate in this public process, please contact Theresa Zimmerman at 907-465-6171 or TDD Relay Service 1-800-770-8973/TTY or dial 711 within 5 days of the expiration date of this public notice to ensure that any necessary accommodations can be provided.

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 01-08-2018

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
POA-2018-00123	CEPOA-RD-N	2020-04-30	2020-07-03

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Beau Middle - Last - Epstein	First - William Middle - J Last - Burnett
Company - IPOP, LLC	Company - Yukuskokon Professional Services, LLC
E-mail Address - beau@ecological-restoration.org	E-mail Address - billburnett@yukuskokon.com
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 9811 W Charleston BLVD, #2-444	Address- PO Box 870507
City - Las Vegas State - NV Zip - 89117 Country - USA	City - Wasilla State - AK Zip - 99687 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax
702-460-1107	907-982-0416 907-373-4000 907-373-4010

STATEMENT OF AUTHORIZATION

11. I hereby authorize, William Burnett to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT — DATE: 2020-04-24

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Bonanza Channel Placer Project

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Bonanza Channel and Tidal Lagoon	Address Not Applicable
15. LOCATION OF PROJECT	City - State- Zip-
Latitude: ◦N 64º32'28.22" Longitude: ◦W 164º27"01.03"	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Various Township - Range -

17. DIRECTIONS TO THE SITE

Drive Nome-Council HWY to project 24 miles east of Nome
1 mile South of Solomon

18. Nature of Activity (Description of project, include all features)

Dredge Mining for Gold

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

To economically produce gold from IPOP's mining claims on the Bonanza Channel and Tidal Lagoon using proven technologies that are specifically designed for shallow water estuary dredging and ultra-fine gold recovery

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

To reclaim, redeposit soils dredged (and processed) from the waterbody back to the waterbody from which it came

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Soil: 4,973,992 (over 5 years)		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 172.7 (over 5 years)
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Section 4.13 (page 28) of the 2020 Narrative and Plan of Operations for the Bonanza Channel Placer Project, Nome, Alaska for complete and thorough description on avoidance, minimization and compensation measures.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Section 3 of the Bonanza Channel Placer Project narrative for list of property owners.

City - Native Allot: AKFF 014761D, Minnie Fargerstrom State - Zip -

b. Address- Native Allot: AKFF 018767A, Jay Trigg

City - Native Allot: AKFF 093474AA, Erwin Tucker State - Zip -

c. Address- Native Allot: AKFF 017846, Shirley Nickalaskey

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
ADNR	APMA	2875		2019-04-02	
USACOE	NWP-6	POA-2018-00123		2019-12-05	
ADF&G	Fish Habitat	Various		Various	
ADEC	Auth. to Discharge	AKG371000		2019-04-01	

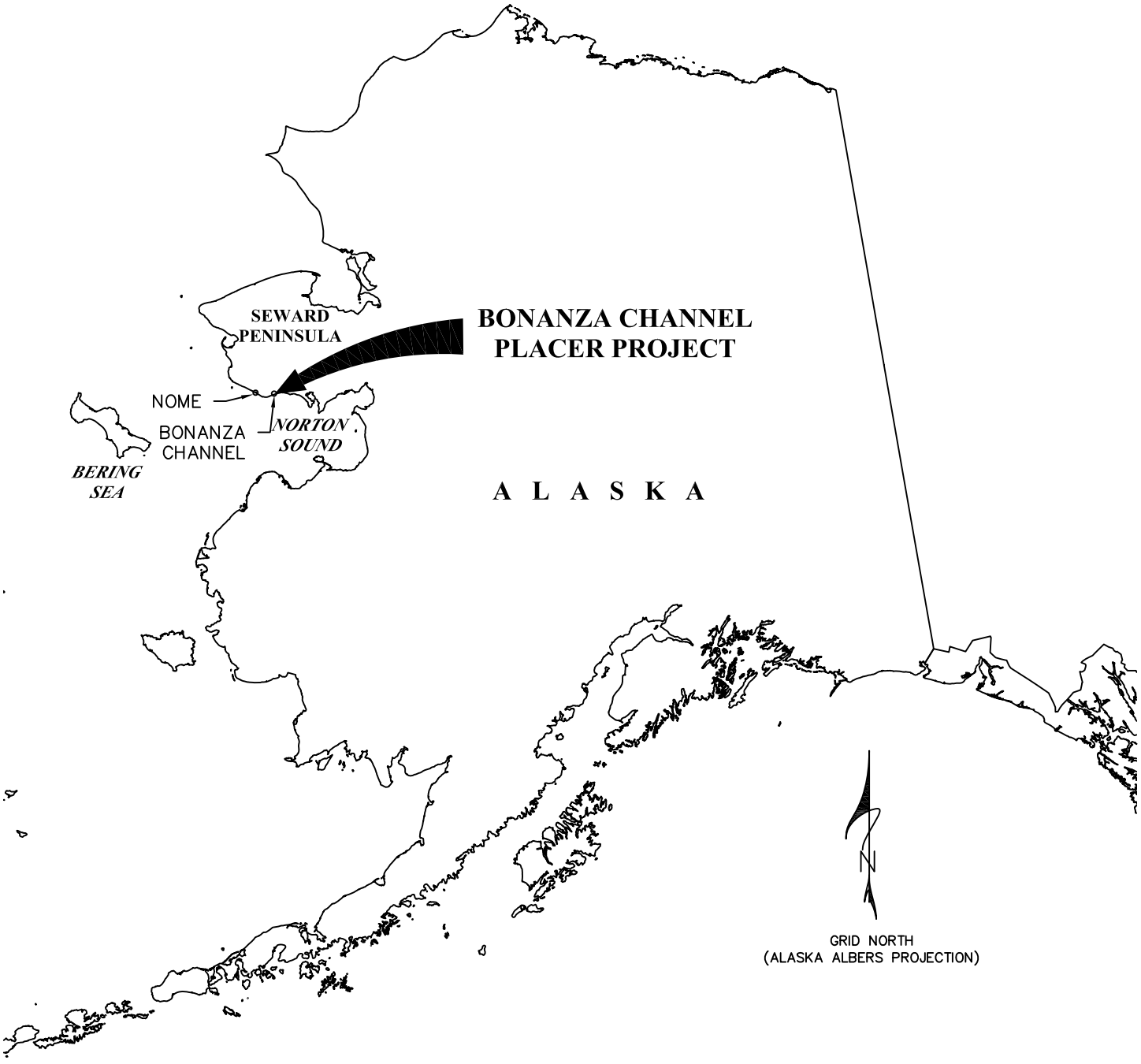
* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
	2020-04-22	Digitally signed by William Burnett DN: cn=William Burnett, o=Yukuskokon Professional Services, LLC., ou, email=billburnett@yukuskokon.com, c=US Date: 2020.04.24 17:32:32 -08'00'	2020-04-22

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

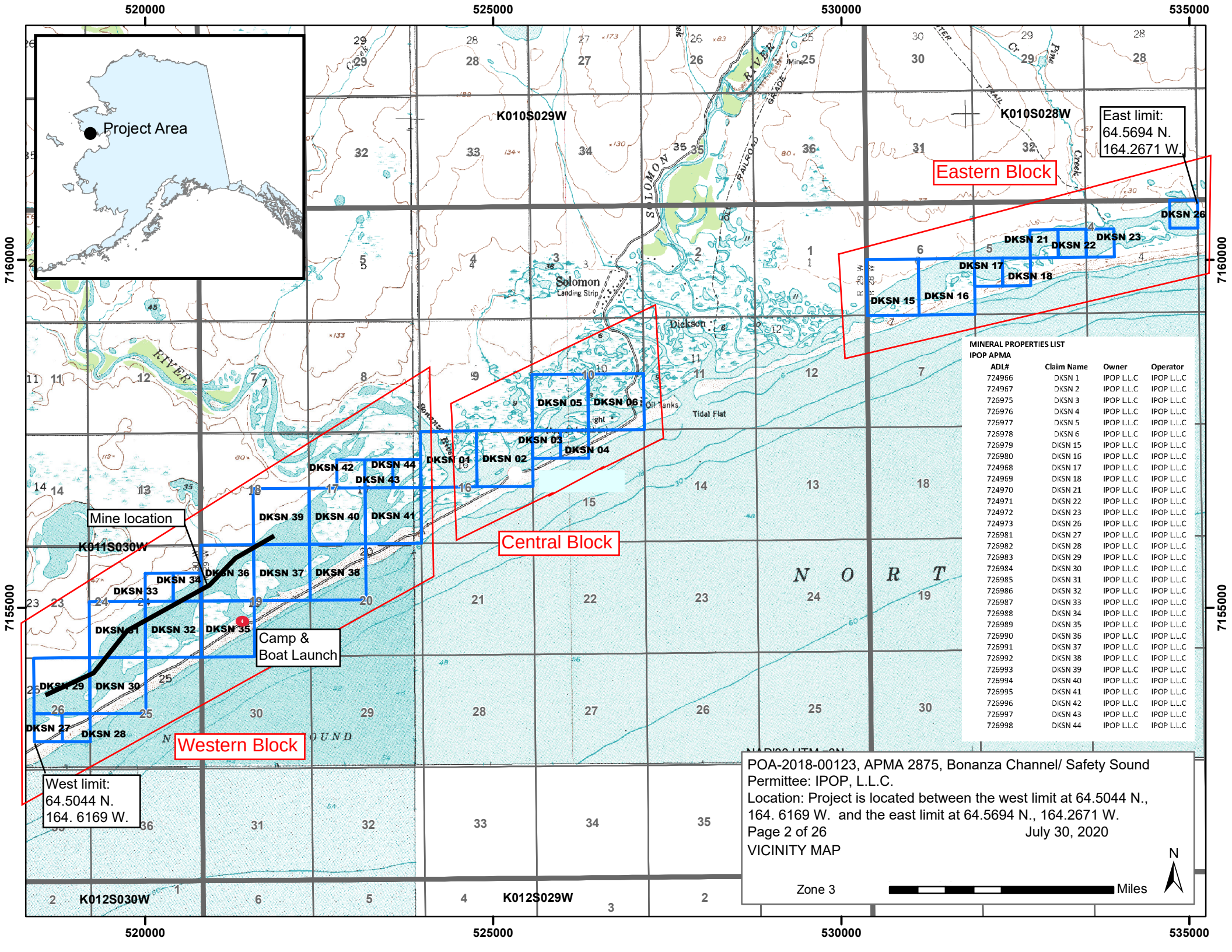
18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.



Plan Sheet 1 of 26
LOCATION MAP

DATE
07/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123 . APMA 2875
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)



MINERAL PROPERTIES LIST
IPOP APMA

ADL#	Claim Name	Owner	Operator
724966	DKSN 1	IPOP L.L.C	IPOP L.L.C
724967	DKSN 2	IPOP L.L.C	IPOP L.L.C
726975	DKSN 3	IPOP L.L.C	IPOP L.L.C
726976	DKSN 4	IPOP L.L.C	IPOP L.L.C
726977	DKSN 5	IPOP L.L.C	IPOP L.L.C
726978	DKSN 6	IPOP L.L.C	IPOP L.L.C
726979	DKSN 15	IPOP L.L.C	IPOP L.L.C
726980	DKSN 16	IPOP L.L.C	IPOP L.L.C
724968	DKSN 17	IPOP L.L.C	IPOP L.L.C
724969	DKSN 18	IPOP L.L.C	IPOP L.L.C
724970	DKSN 21	IPOP L.L.C	IPOP L.L.C
724971	DKSN 22	IPOP L.L.C	IPOP L.L.C
724972	DKSN 23	IPOP L.L.C	IPOP L.L.C
724973	DKSN 26	IPOP L.L.C	IPOP L.L.C
726981	DKSN 27	IPOP L.L.C	IPOP L.L.C
726982	DKSN 28	IPOP L.L.C	IPOP L.L.C
726983	DKSN 29	IPOP L.L.C	IPOP L.L.C
726984	DKSN 30	IPOP L.L.C	IPOP L.L.C
726985	DKSN 31	IPOP L.L.C	IPOP L.L.C
726986	DKSN 32	IPOP L.L.C	IPOP L.L.C
726987	DKSN 33	IPOP L.L.C	IPOP L.L.C
726988	DKSN 34	IPOP L.L.C	IPOP L.L.C
726989	DKSN 35	IPOP L.L.C	IPOP L.L.C
726990	DKSN 36	IPOP L.L.C	IPOP L.L.C
726991	DKSN 37	IPOP L.L.C	IPOP L.L.C
726992	DKSN 38	IPOP L.L.C	IPOP L.L.C
726993	DKSN 39	IPOP L.L.C	IPOP L.L.C
726994	DKSN 40	IPOP L.L.C	IPOP L.L.C
726995	DKSN 41	IPOP L.L.C	IPOP L.L.C
726996	DKSN 42	IPOP L.L.C	IPOP L.L.C
726997	DKSN 43	IPOP L.L.C	IPOP L.L.C
726998	DKSN 44	IPOP L.L.C	IPOP L.L.C

POA-2018-00123, APMA 2875, Bonanza Channel/ Safety Sound
Permittee: IPOP, L.L.C.
Location: Project is located between the west limit at 64.5044 N., 164. 6169 W. and the east limit at 64.5694 N., 164.2671 W.

July 30, 2020
VICINITY MAP

A

Claim Name	ADL Number	Date Located	Rec. Doc. No.	Section	¼ or ¼ ¼ section
DKSN 15	ADL726979	12/28/2017	2018-000030-0	6	SW
DKSN 16	ADL726980	12/28/2017	2018-000031-0	6	SE
DKSN 17	ADL724968	8/3/2017	2017-000079-0	5	SW
DKSN 18	ADL724969	8/3/2017	2017-000069-0	5	NESW
DKSN 21	ADL724970	8/6/2017	2017-000070-0	5	SWNE
DKSN 22	ADL724971	8/6/2017	2017-000794-0	5	SENE
DKSN 23	ADL724972	8/3/2017	2017-000795-0	4	SWNW
DKSN 26	ADL724973	8/6/2017	2017-000796-0	4	NENE

B

Claim Name	ADL Number	Date Located	Rec. Doc. No.	Section	¼ or ¼ ¼ section
DKSN 01	ADL724966	8/3/2017	2017-000789-0	16	NW
DKSN 02	ADL724967	8/3/2017	2017-000790-0	16	NE
DKSN 03	ADL726975	12/28/2017	2018-000026-0	15	NW
DKSN 04	ADL726976	12/28/2017	2018-000027-0	15	NENW
DKSN 05	ADL726977	12/28/2017	2018-000028-0	10	SW
DKSN 06	ADL726978	12/28/2017	2018-000029-0	10	SE
DKSN 35	ADL726989	12/29/2017	2018-000040-0	19	SW
DKSN 36	ADL726990	12/29/2017	2018-000041-0	19	NW
DKSN 37	ADL726991	12/29/2017	2018-000042-0	19	NE
DKSN 38	ADL726992	12/29/2017	2018-000043-0	20	NW
DKSN 39	ADL726993	12/29/2017	2018-000044-0	21	SE
DKSN 40	ADL726994	12/29/2017	2018-000045-0	17	SW
DKSN 41	ADL726995	12/29/2017	2018-000046-0	17	SE
DKSN 42	ADL726996	12/29/2017	2018-000047-0	17	NW
DKSN 43	ADL726997	12/29/2017	2018-000048-0	17	SWNE
DKSN 44	ADL726998	12/29/2017	2018-000049-0	17	SENE

Claim Name	ADL Number	Date Located	Rec. Doc. No.	Section	¼ or ¼ ¼ section
DKSN 27	ADL 726981	12/29/2017	2018-000032-0	26	NWSE
DKSN 28	ADL 726982	12/30/2017	2018-000033-0	26	NESE
DKSN 29	ADL 726983	12/29/2017	2018-000034-0	26	NE
DKSN 30	ADL 726984	12/29/2017	2018-000035-0	25	NW
DKSN 31	ADL 726985	12/29/2017	2018-000036-0	24	SW
DKSN 32	ADL 726986	12/29/2017	2018-000037-0	24	SE
DKSN 33	ADL 726987	12/29/2017	2018-000038-0	24	SWNE
DKSN 34	ADL 726988	12/29/2017	2018-000039-0	24	SENE

NOTES

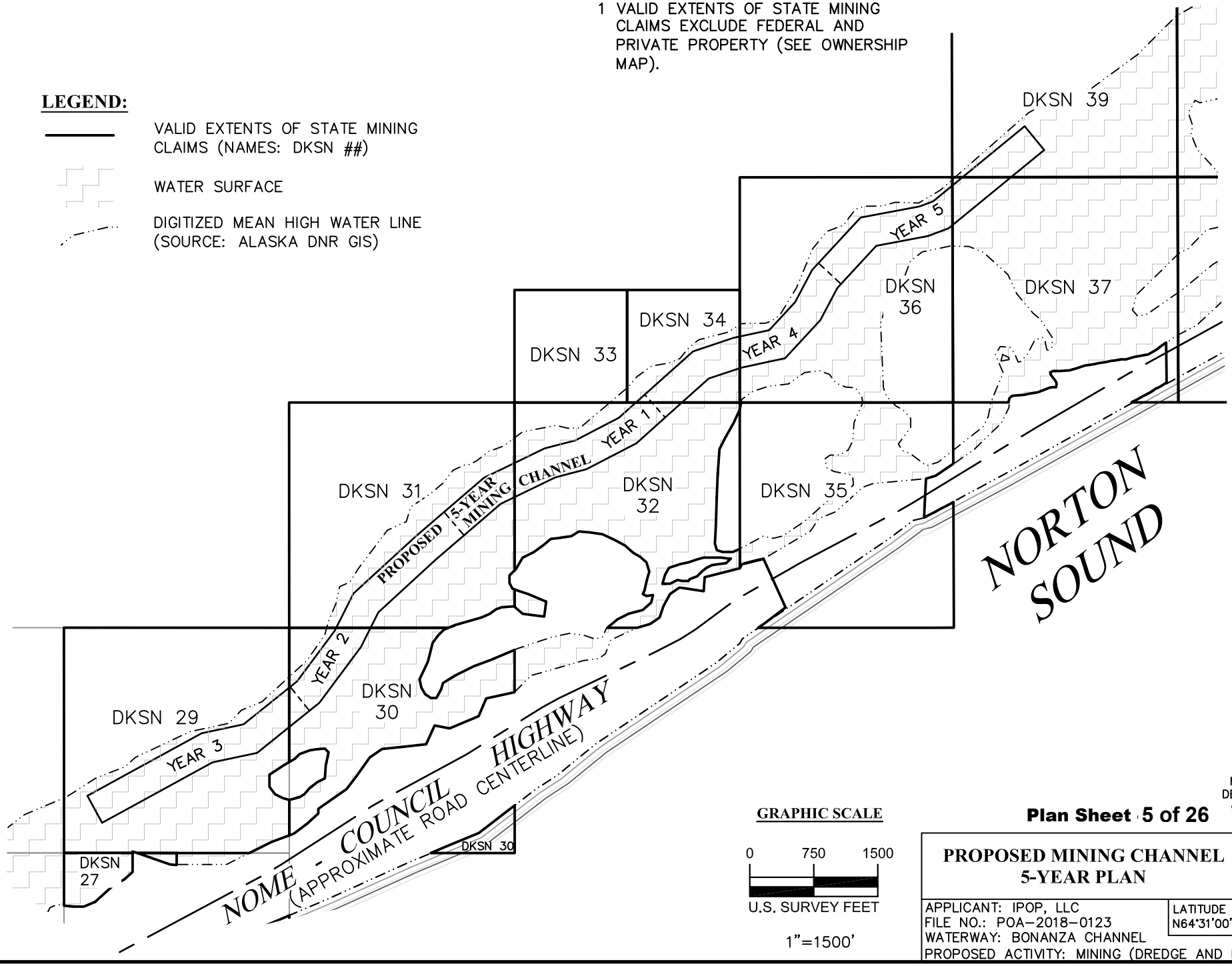
1 VALID EXTENTS OF STATE MINING CLAIMS EXCLUDE FEDERAL AND PRIVATE PROPERTY (SEE OWNERSHIP MAP).

LEGEND:

VALID EXTENTS OF STATE MINING CLAIMS (NAMES: DKSN ##)

WATER SURFACE

DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)



GRAPHIC SCALE

0 750 1500

U.S. SURVEY FEET

1"=1500'

Plan Sheet 5 of 26

PROPOSED MINING CHANNEL 5-YEAR PLAN	DATE 07/30/2020
APPLICANT: IPOP, LLC FILE NO.: POA-2018-0123 WATERWAY: BONANZA CHANNEL PROPOSED ACTIVITY: MINING (DREDGE AND FILL)	LATITUDE N64°31'00" LONGITUDE W164°34'54"

LEGEND:

VALID EXTENTS OF STATE MINING CLAIMS (NAME: DKSN ##)

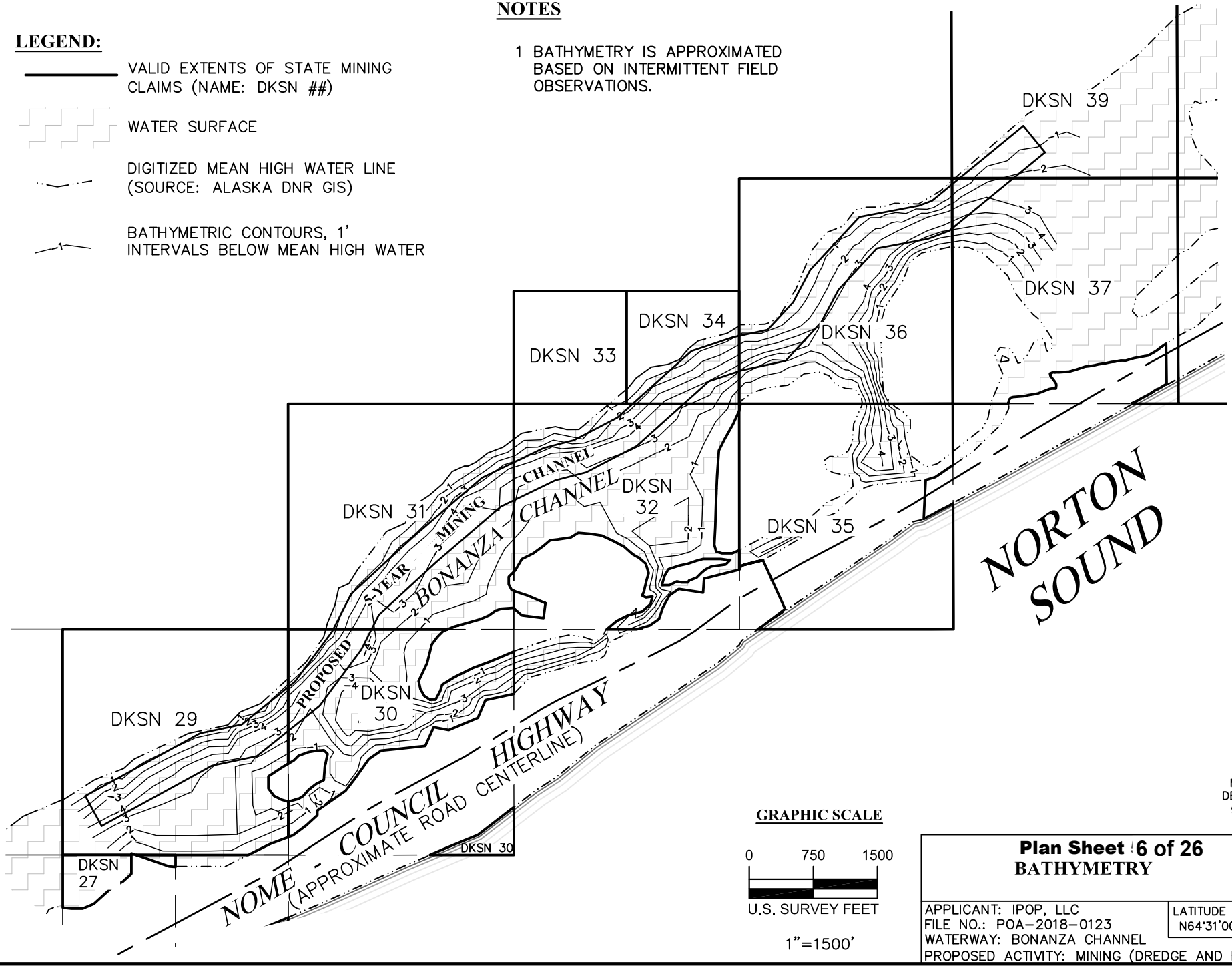
WATER SURFACE

DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)

BATHYMETRIC CONTOURS, 1' INTERVALS BELOW MEAN HIGH WATER

NOTES

1 BATHYMETRY IS APPROXIMATED BASED ON INTERMITTENT FIELD OBSERVATIONS.



GRAPHIC SCALE

0 750 1500

U.S. SURVEY FEET

1"=1500'

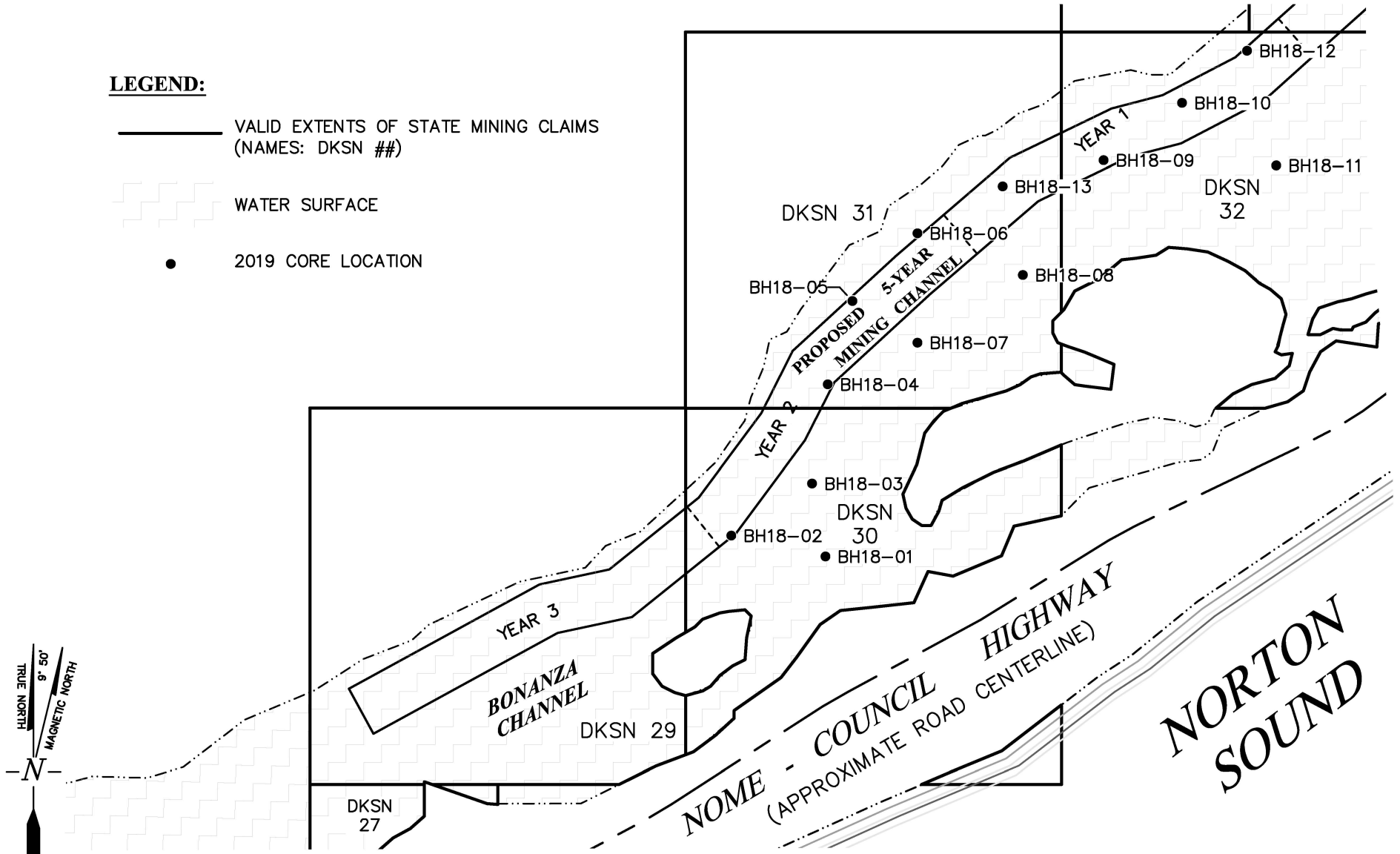
Plan Sheet 6 of 26

BATHYMETRY

DATE 7/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

LATITUDE	LONGITUDE
N64°31'00"	W164°34'54



Plan Sheet 7 of 26

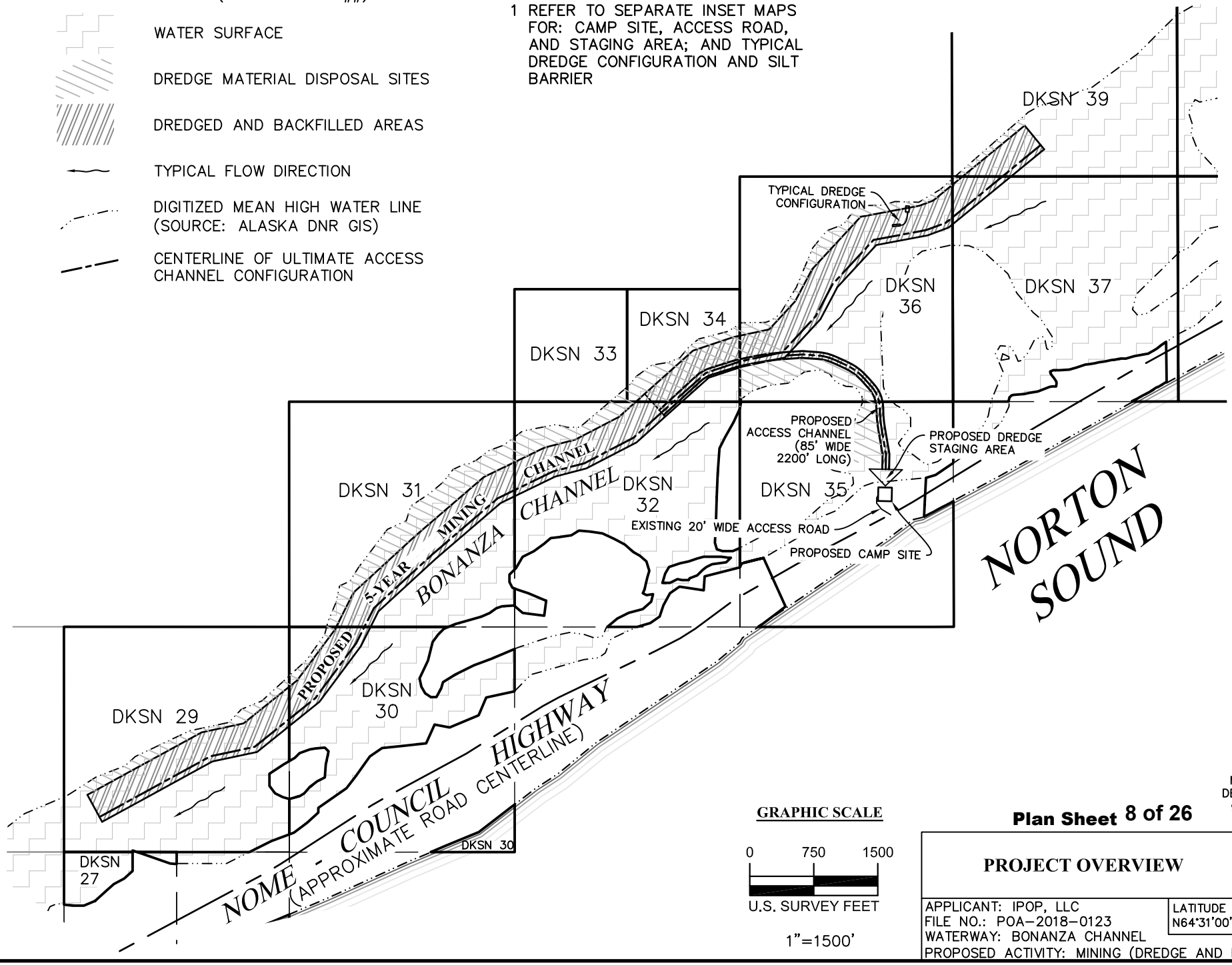
PROPOSED MINING CHANNEL AND 2019 CORE LOCATIONS	DATE 7/30/2020
APPLICANT: IPOP, LLC FILE NO.: POA–2018–0123 WATERWAY: BONANZA CHANNEL PROPOSED ACTIVITY: MINING (DREDGE AND FILL)	LATITUDE N64°31'00" LONGITUDE W164°34'54"

LEGEND:

- VALID EXTENTS OF STATE MINING CLAIMS (NAMES: DKSN ##)
- WATER SURFACE
- DREDGE MATERIAL DISPOSAL SITES
- DREDGED AND BACKFILLED AREAS
- TYPICAL FLOW DIRECTION
- DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)
- CENTERLINE OF ULTIMATE ACCESS CHANNEL CONFIGURATION

NOTES

1 REFER TO SEPARATE INSET MAPS FOR: CAMP SITE, ACCESS ROAD, AND STAGING AREA; AND TYPICAL DREDGE CONFIGURATION AND SILT BARRIER



GRAPHIC SCALE

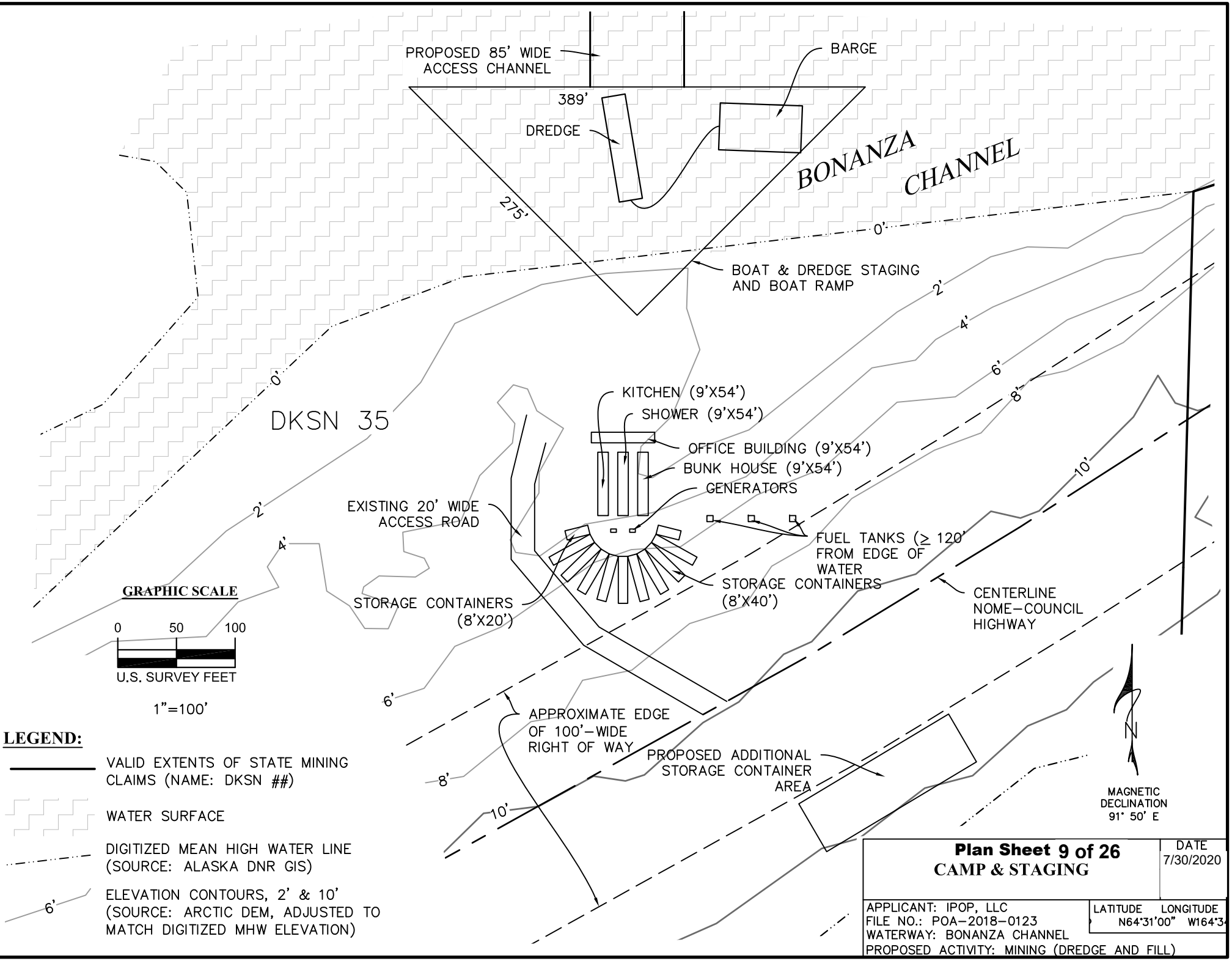
0 750 1500

U.S. SURVEY FEET

1"=1500'

Plan Sheet 8 of 26

PROJECT OVERVIEW	DATE 07/30/2020
APPLICANT: IPOP, LLC FILE NO.: POA-2018-0123 WATERWAY: BONANZA CHANNEL PROPOSED ACTIVITY: MINING (DREDGE AND FILL)	LATITUDE N64°31'00" LONGITUDE W164°34'54"



LEGEND:

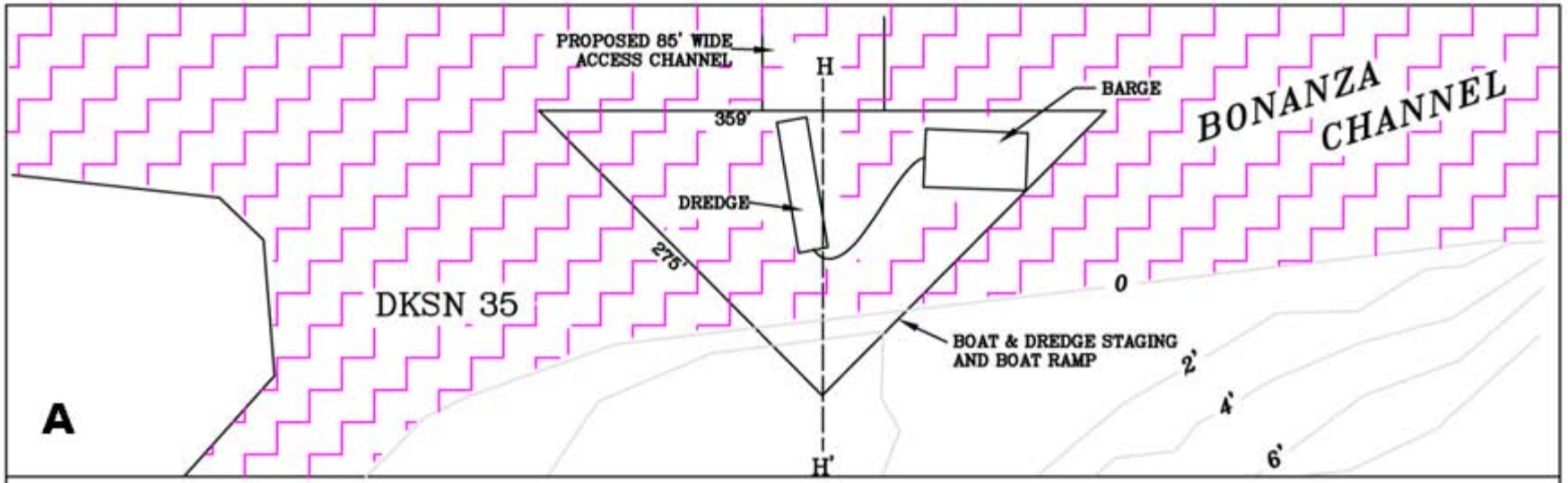
- VALID EXTENTS OF STATE MINING CLAIMS (NAME: DKSN ##)
- WATER SURFACE
- DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)
- 6' ELEVATION CONTOURS, 2' & 10' (SOURCE: ARCTIC DEM, ADJUSTED TO MATCH DIGITIZED MHW ELEVATION)

Plan Sheet 9 of 26
CAMP & STAGING

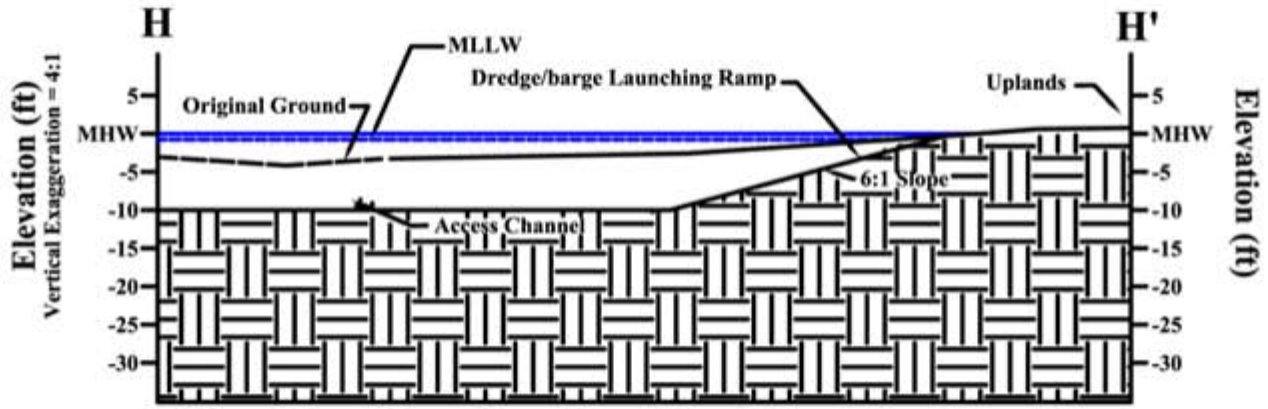
DATE 7/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

LATITUDE	LONGITUDE
N64°31'00"	W164°3



B



POA-2018-00123 , APMA 2875

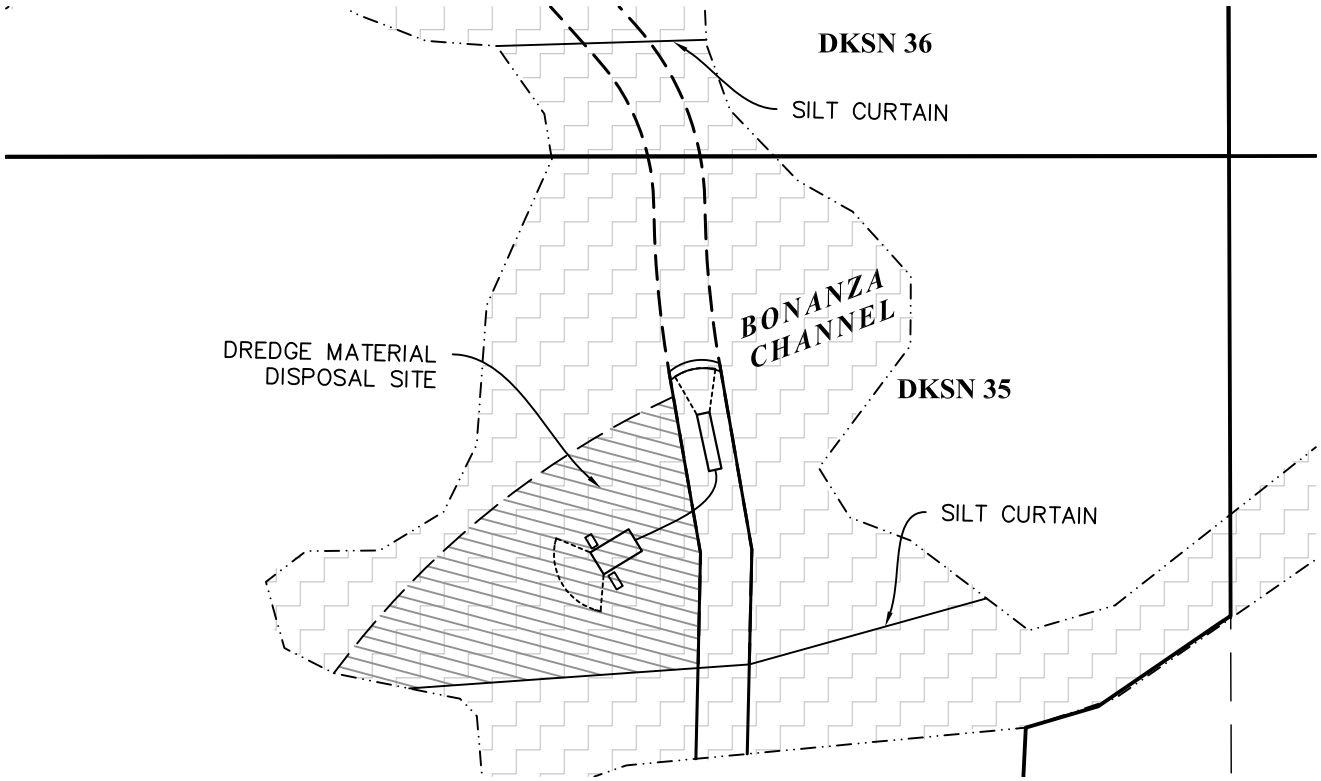
1. Dimensions in feet
2. H-H' Indicates Cross Section Line
3. MHW Line Based on Aerial Photo Interpretation and USGS Topo

Plan Sheet 10 of 26

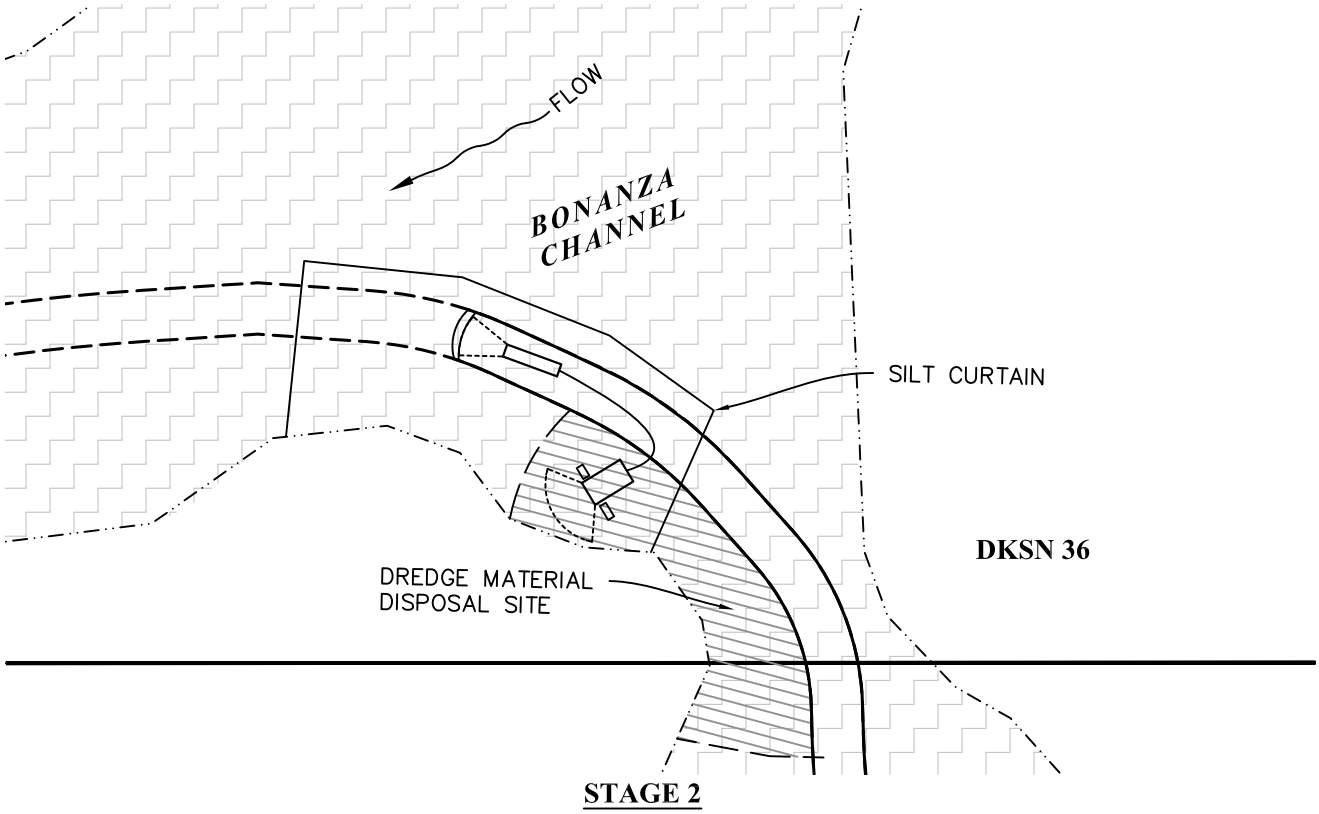
A) Plan View Dredge/Barge/Boat Launching Ramp
B) Generalized Cross Section of Boat Ramp

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020



STAGE 1



STAGE 2

LEGEND:

VALID EXTENTS OF STATE MINING CLAIMS (NAME: DKSN ##)

WATER SURFACE

DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)

GRAPHIC SCALE

0 150 300

U.S. SURVEY FEET

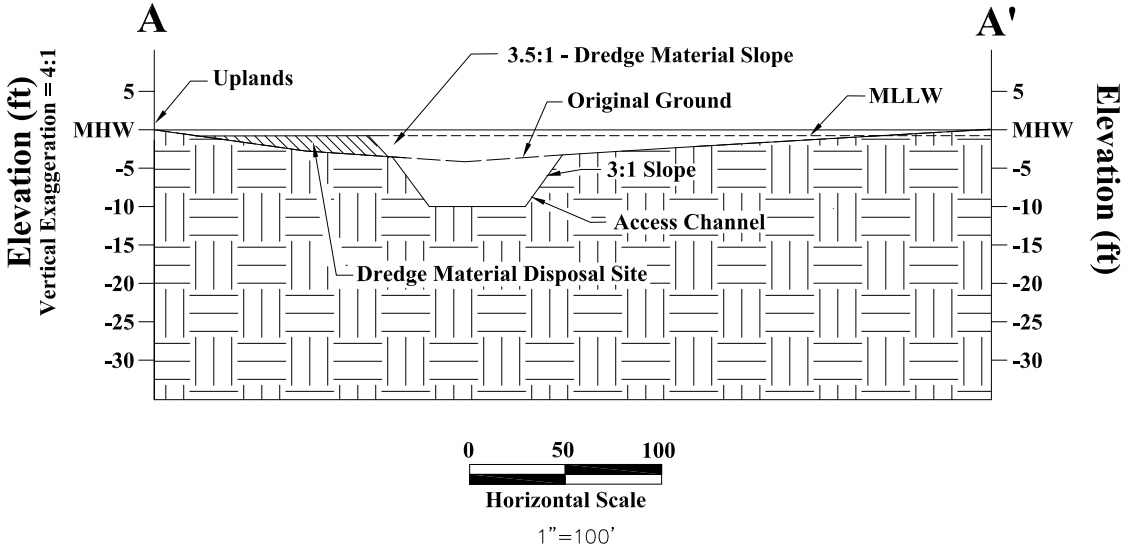
1"=300'

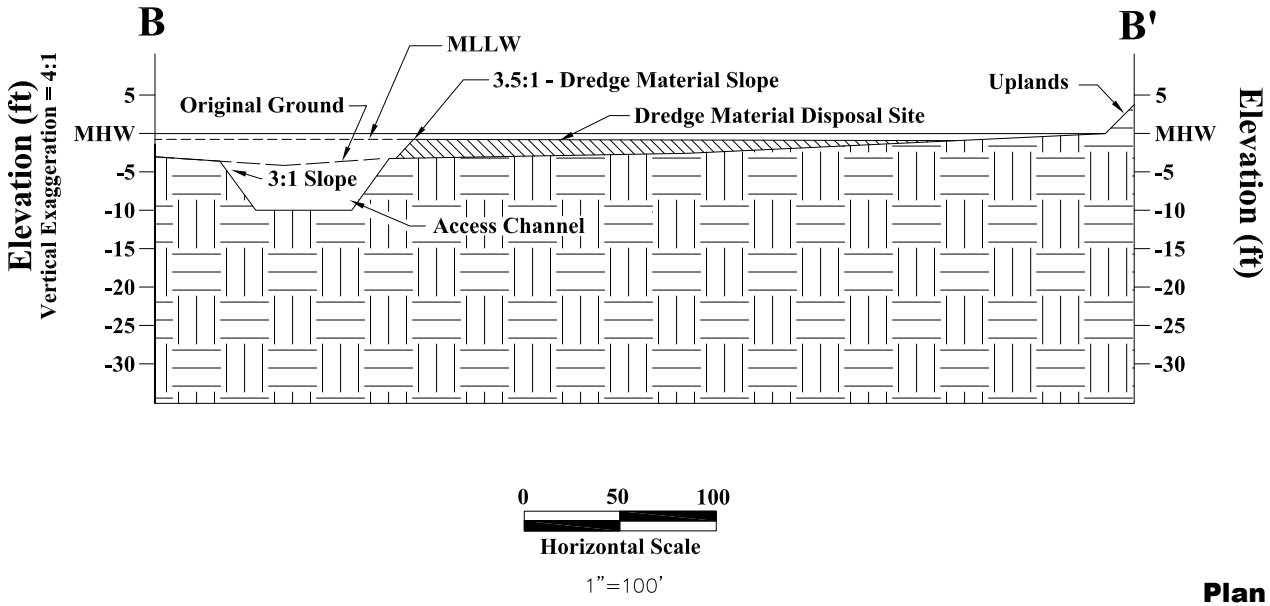
N

MAGNETIC DECLINATION 91° 50' E

Plan Sheet 11 of 26

ACCESS CHANNEL DEVELOPMENT	DATE 7/30/2020
APPLICANT: IPOP, LLC FILE NO.: POA-2018-0123 WATERWAY: BONANZA CHANNEL PROPOSED ACTIVITY: MINING (DREDGE AND FILL)	LATITUDE N64°31'17" LONGITUDE W164°33'46"

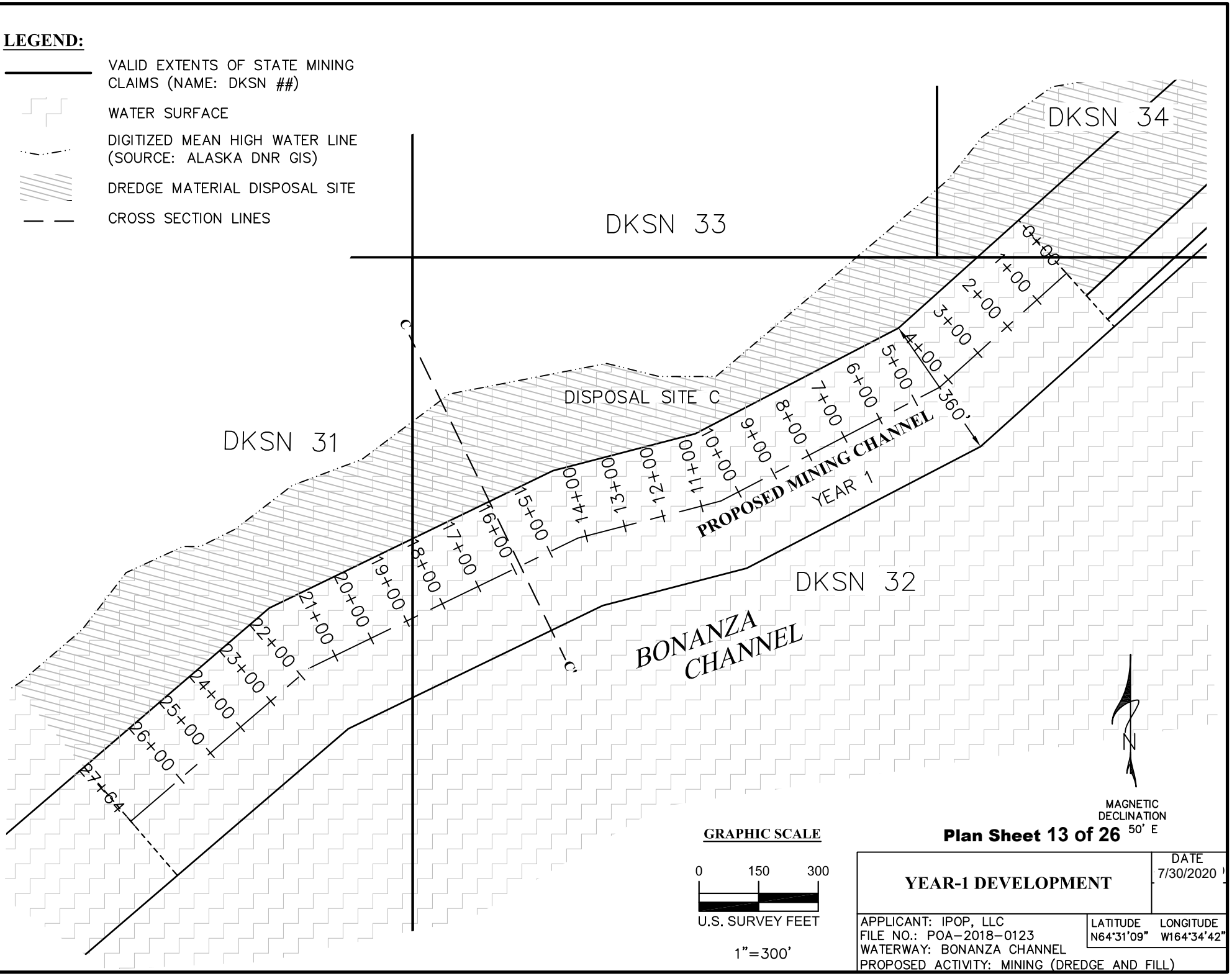


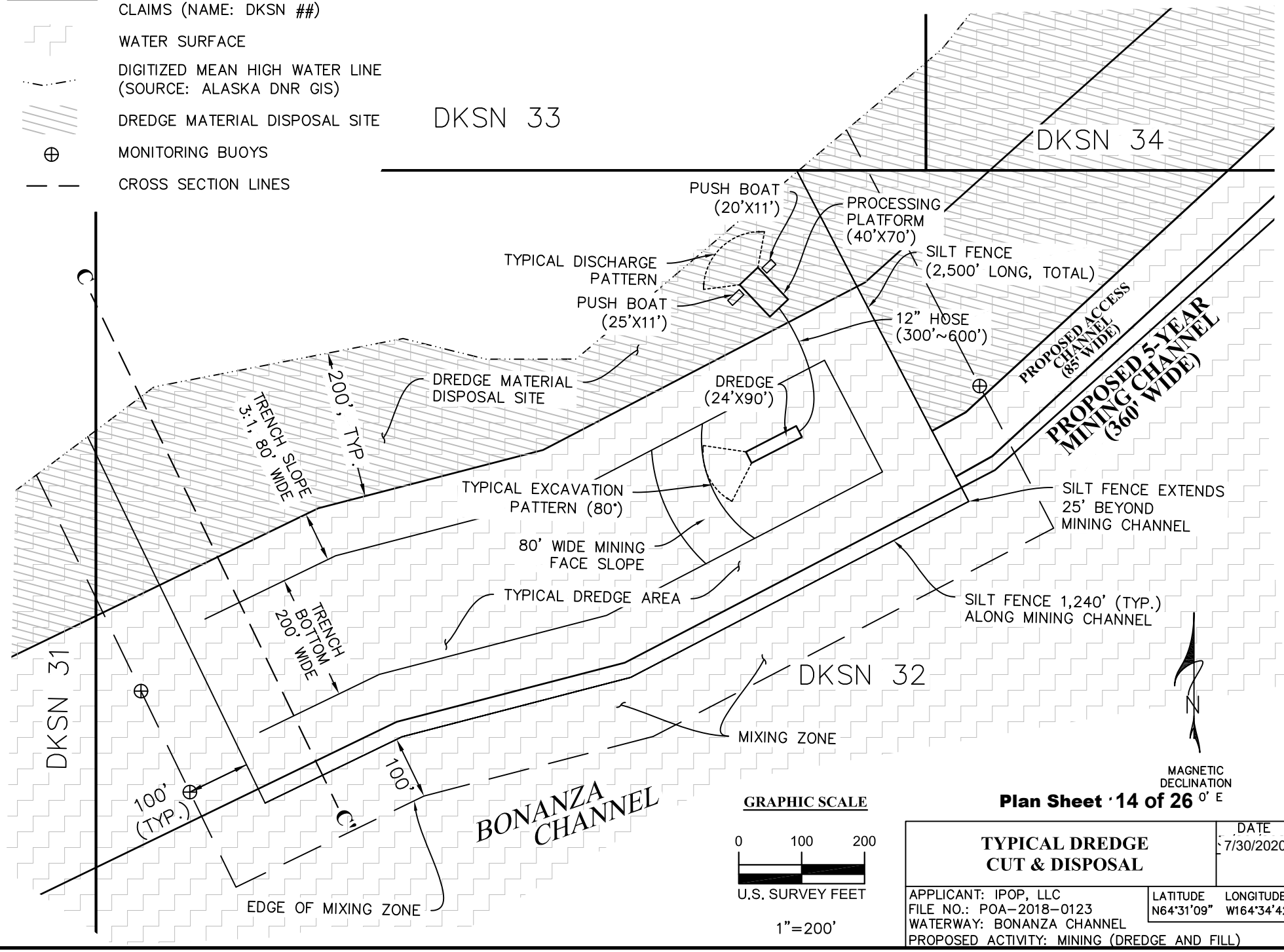


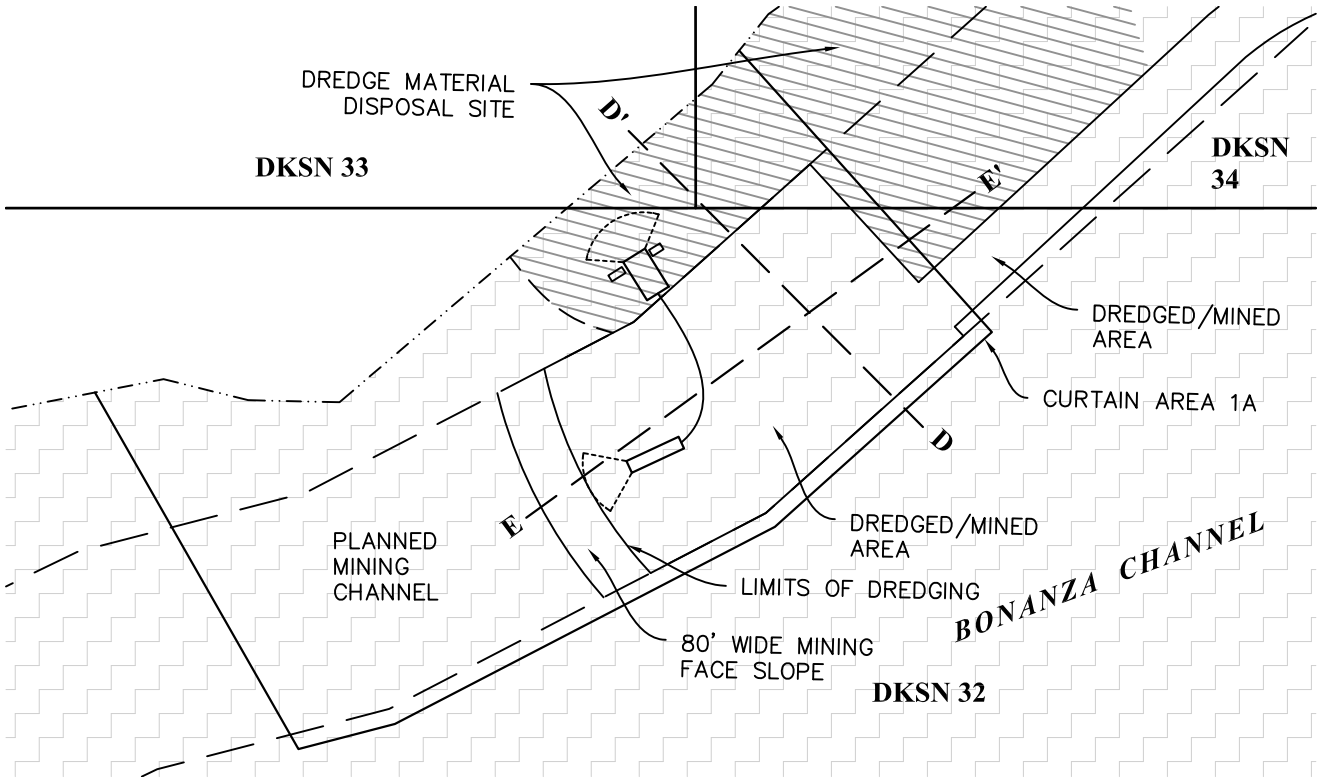
Plan Sheet 12 of 26

CROSS SECTIONS	DATE 7/30/2020

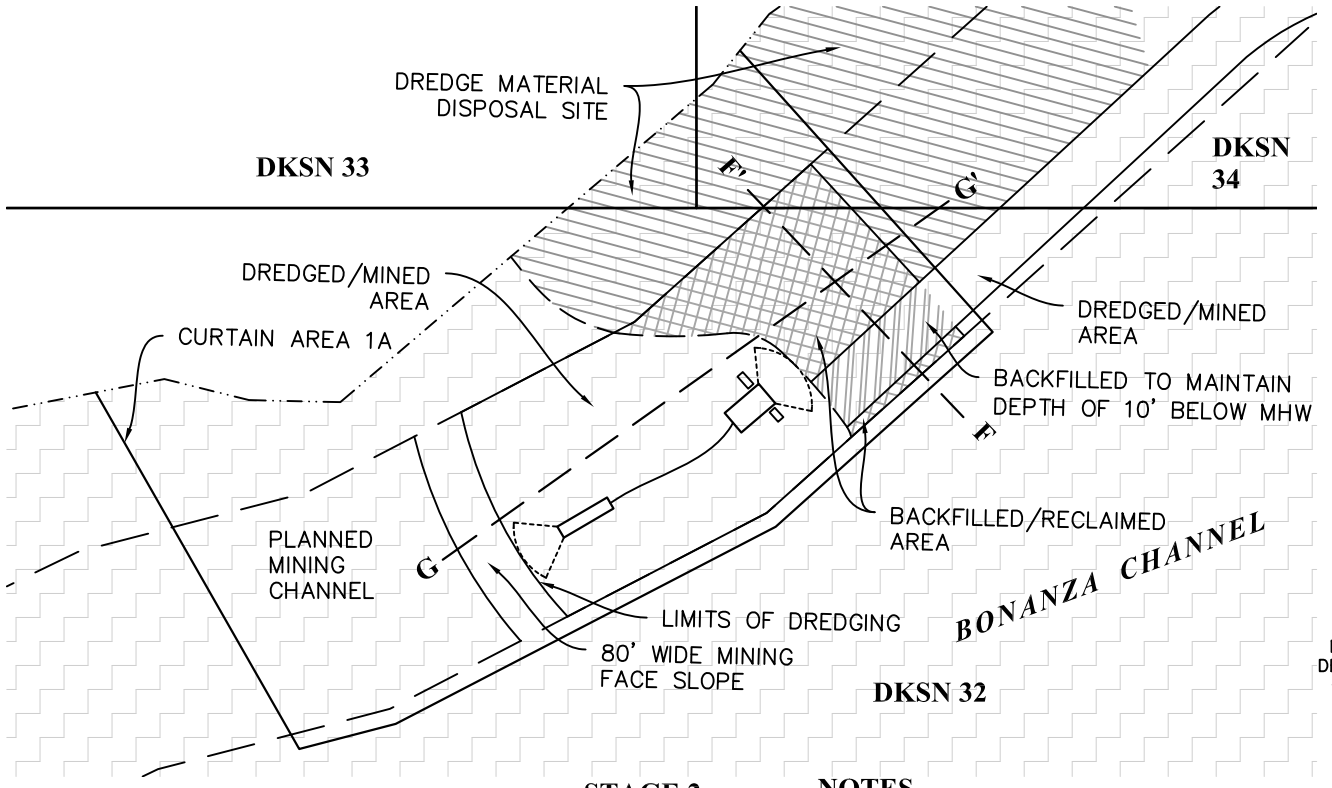
APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)


LEGEND:
VALID EXTENTS OF STATE MINING CLAIMS (NAME: DKSN ##)
WATER SURFACE
DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)
DREDGE MATERIAL DISPOSAL SITE
CROSS SECTION LINES
DKSN 34
DKSN 33
DKSN 31
DKSN 32
DISPOSAL SITE C
PROPOSED MINING CHANNEL
YEAR 1
BONANZA CHANNEL
C
C'
0+00
1+00
2+00
3+00
4+00
360'
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+64
N
MAGNETIC DECLINATION 15° E
GRAPHIC SCALE
0
150
300
U.S. SURVEY FEET
1"=300'
Plan Sheet 13 of 26
YEAR-1 DEVELOPMENT
DATE 7/30/2020
APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)
LATITUDE N64°31'09"
LONGITUDE W164°34'42"


LEGEND:
VALID EXTENTS OF STATE MINING CLAIMS (NAME: DKSN ##)
WATER SURFACE
DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)
DREDGE MATERIAL DISPOSAL SITE
MONITORING BUOYS
CROSS SECTION LINES
DKSN 33
DKSN 34
DKSN 31
DKSN 32
PUSH BOAT (20'X11')
PROCESSING PLATFORM (40'X70')
TYPICAL DISCHARGE PATTERN
SILT FENCE (2,500' LONG, TOTAL)
PUSH BOAT (25'X11')
12" HOSE (300'~600')
PROPOSED ACCESS CHANNEL (85' WIDE)
PROPOSED 5-YEAR MINING CHANNEL (360' WIDE)
DREDGE MATERIAL DISPOSAL SITE
DREDGE (24'X90')
200', TYP.
TRENCH SLOPE 3:1, 80' WIDE
TYPICAL EXCAVATION PATTERN (80')
SILT FENCE EXTENDS 25' BEYOND MINING CHANNEL
80' WIDE MINING FACE SLOPE
TYPICAL DREDGE AREA
TRENCH BOTTOM 200' WIDE
SILT FENCE 1,240' (TYP.) ALONG MINING CHANNEL
MIXING ZONE
100' (TYP.)
100'
C
C'
BONANZA CHANNEL
EDGE OF MIXING ZONE
N
MAGNETIC DECLINATION 0° E
GRAPHIC SCALE
0 100 200
U.S. SURVEY FEET
1"=200'
Plan Sheet 14 of 26
TYPICAL DREDGE CUT & DISPOSAL
DATE 7/30/2020
APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)
LATITUDE N64°31'09"
LONGITUDE W164°34'42"



STAGE 1



STAGE 2

LEGEND:

- VALID EXTENTS OF STATE MINING CLAIMS (NAME: DKSN ##)
- WATER SURFACE
- DIGITIZED MEAN HIGH WATER LINE (SOURCE: ALASKA DNR GIS)
- CROSS SECTION LINES

GRAPHIC SCALE

0 150 300

U.S. SURVEY FEET

1"=300'

NOTES

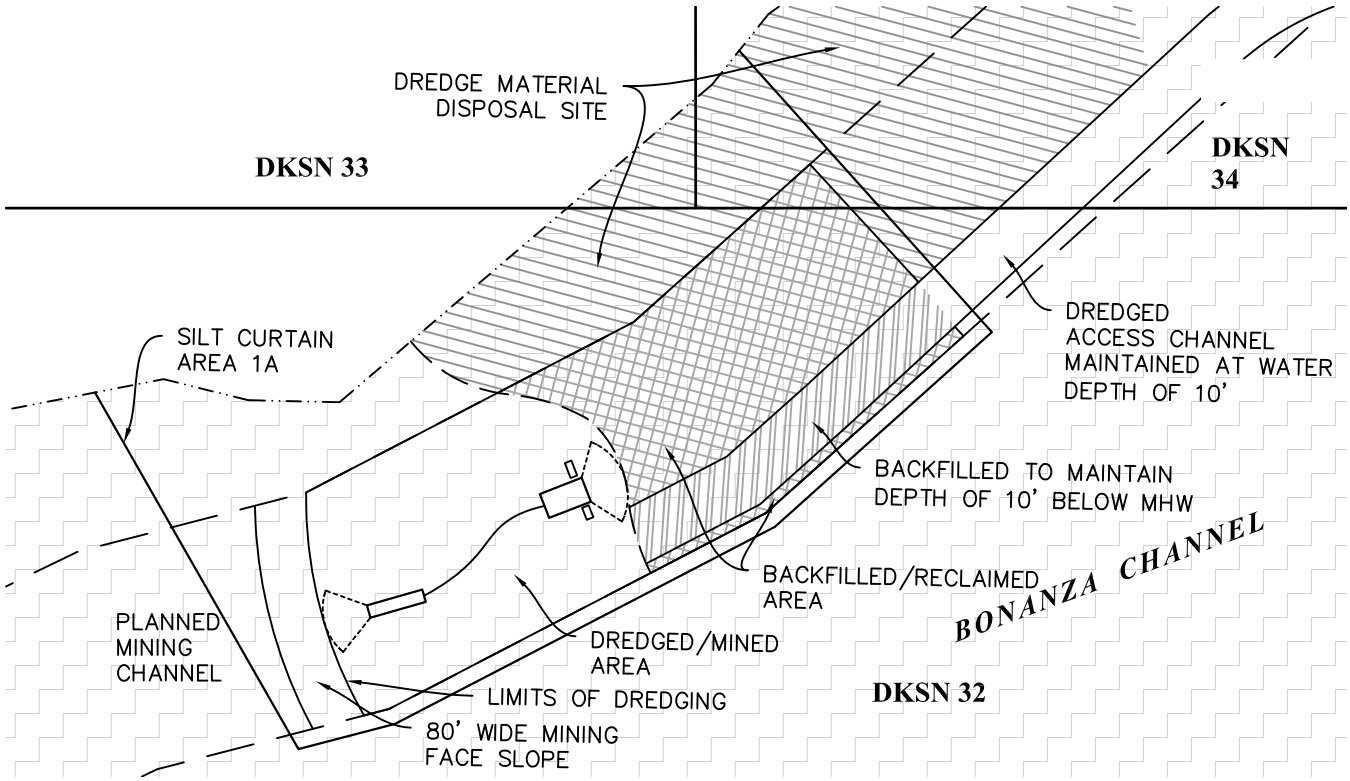
1 EXCAVATION SIDE SLOPES IN DREDGED/MINED AREAS ARE 80' WIDE AT 3:1, TYP. (SEE TYPICAL DREDGE CUT & FILL MAP FOR DETAILS)

Plan Sheet 15 of 26
TYPICAL DREDGE STAGES

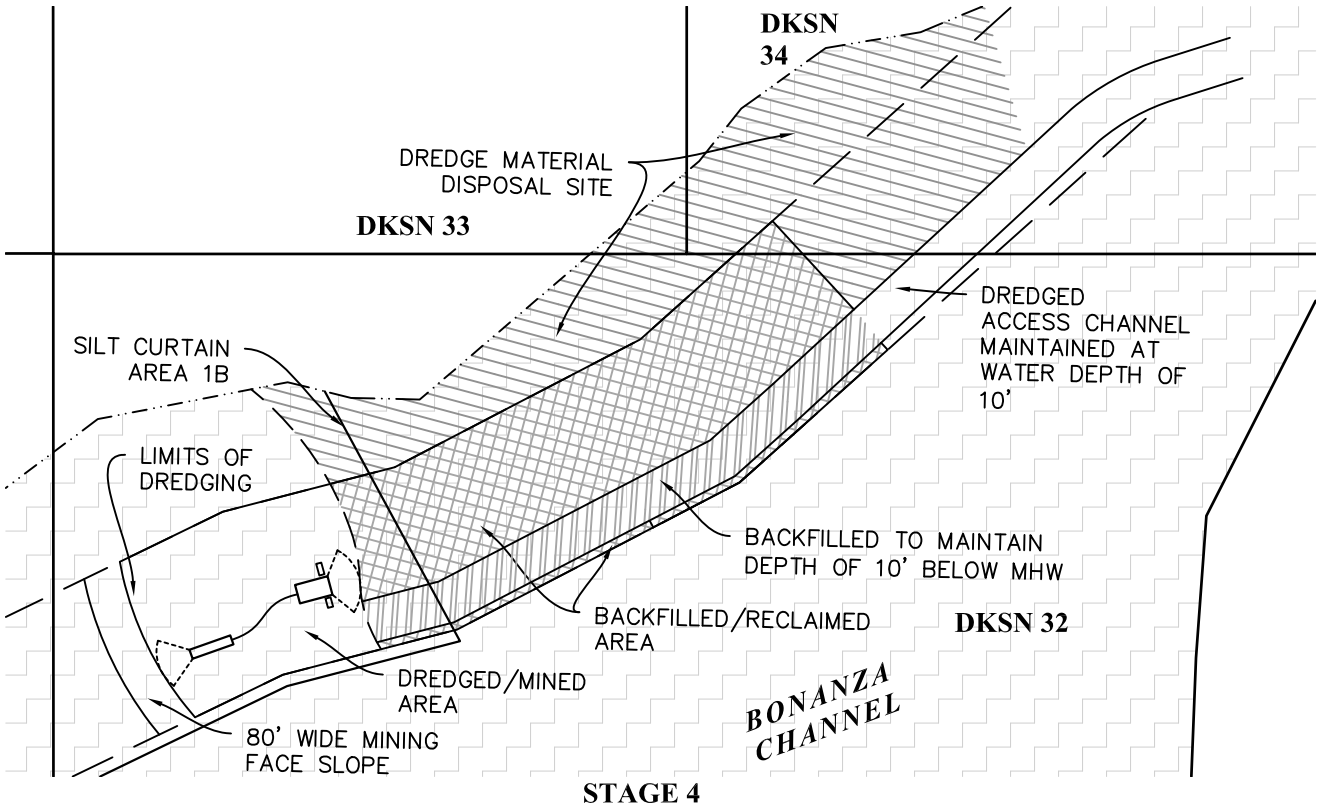
DATE 7/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

LATITUDE	LONGITUDE
N64°31'09"	W164°34'42"



STAGE 3



STAGE 4

1"=400'

N

MAGNETIC
DECLINATION
91° 50' E

GRAPHIC SCALE

0 150 300

U.S. SURVEY FEET

1"=300'

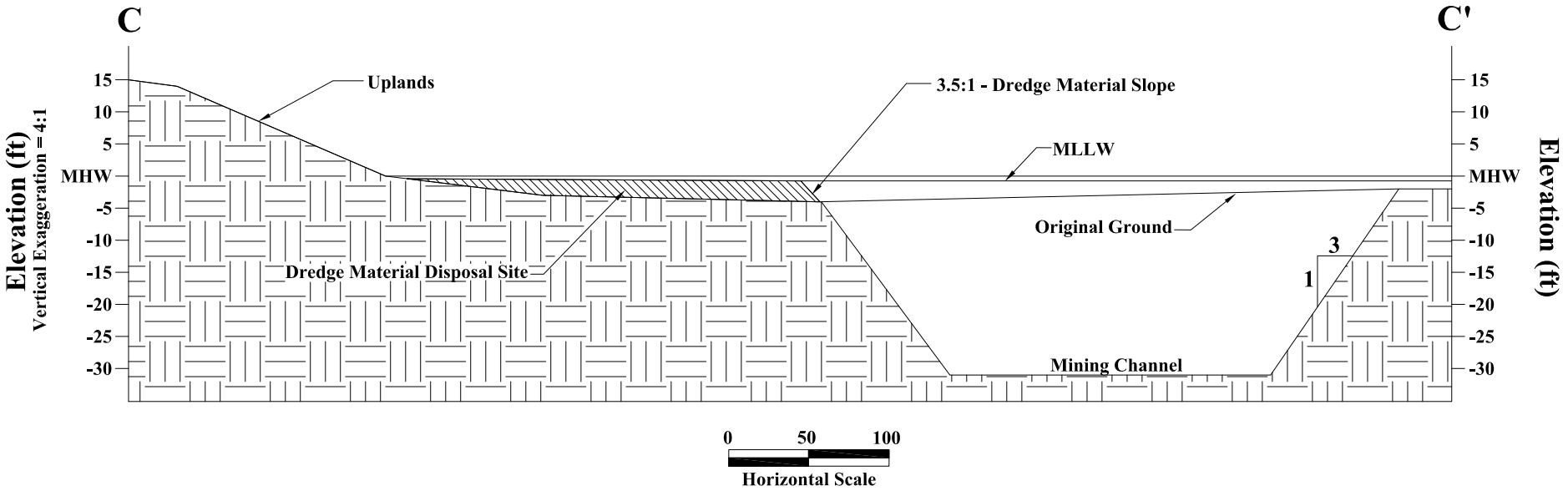
Plan Sheet 16 of 26

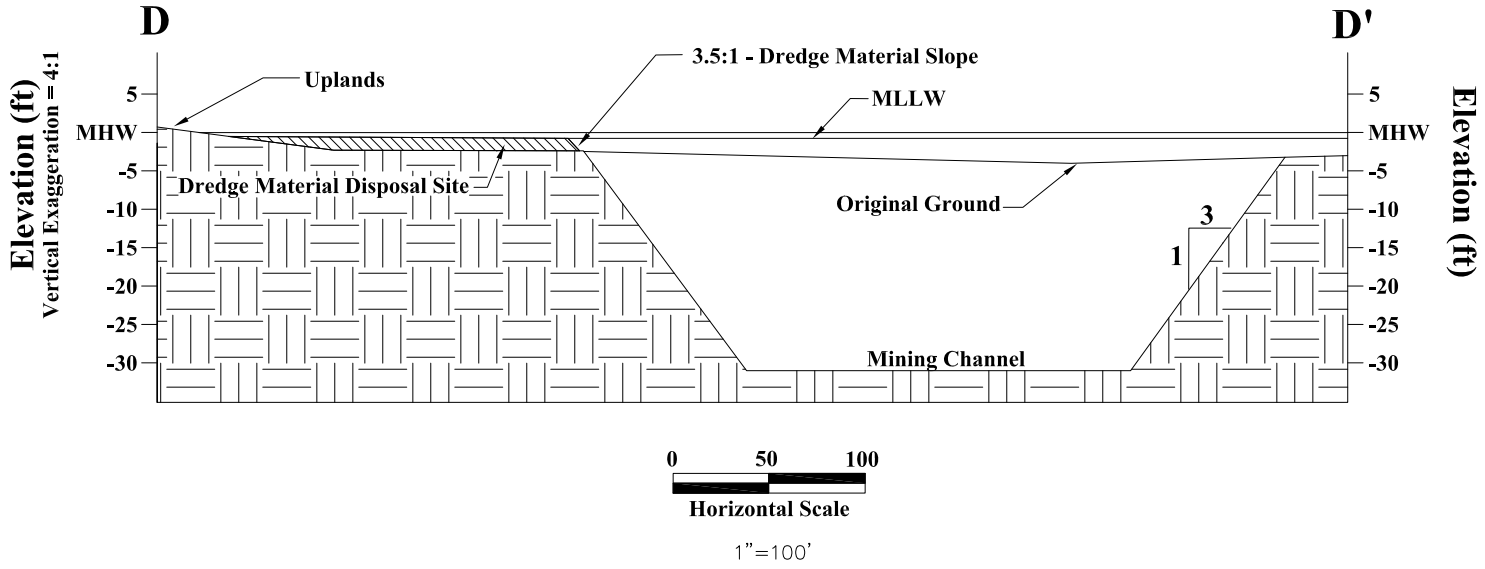
TYPICAL DREDGE STAGES

DATE
7/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

LATITUDE	LONGITUDE
N64°31'09"	W164°34'42"

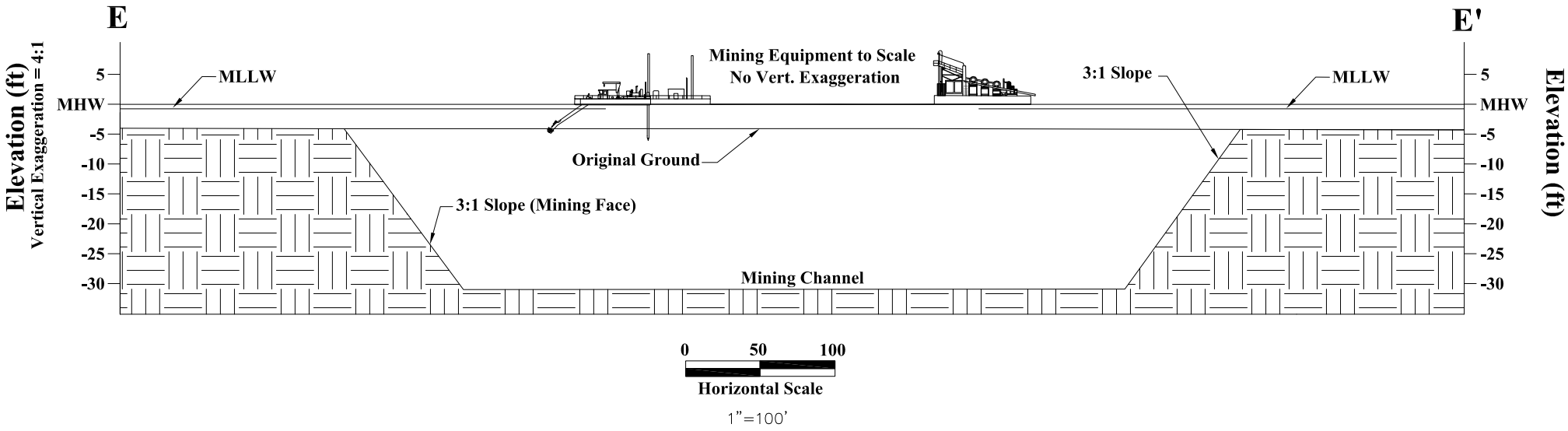


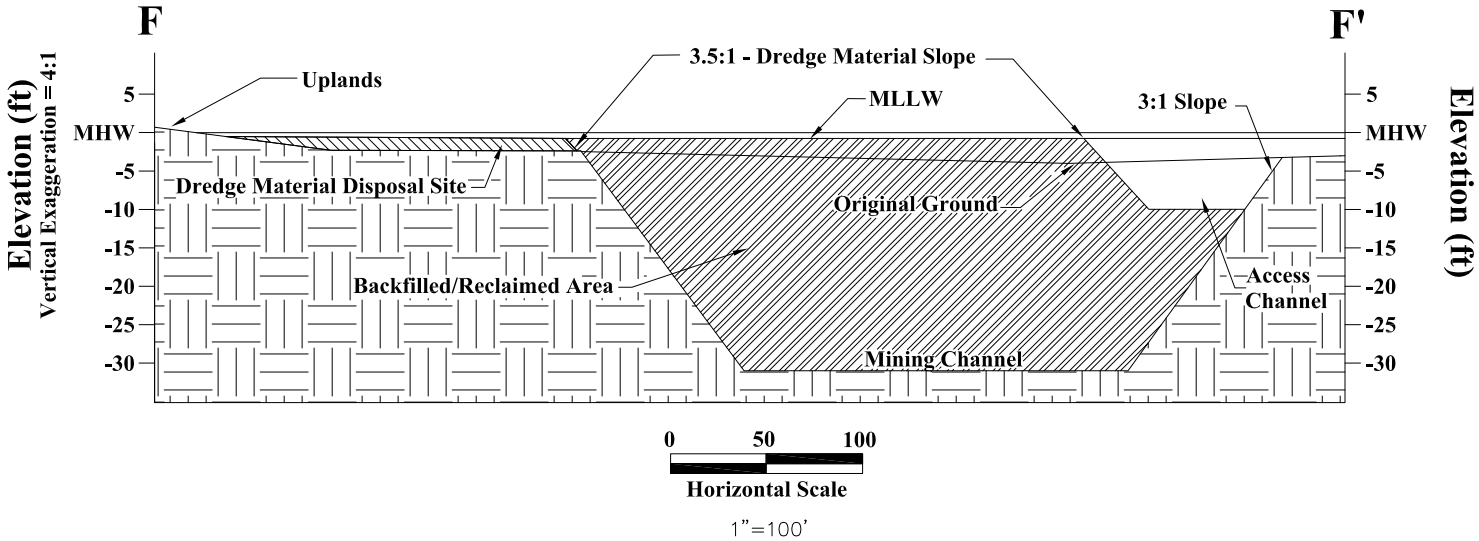


Plan Sheet 17 of 26
CROSS SECTIONS

DATE
7/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)





Plan Sheet 18 of 26
CROSS SECTIONS

DATE
7/30/2020

APPLICANT: IPOP, LLC
FILE NO.: POA-2018-0123
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

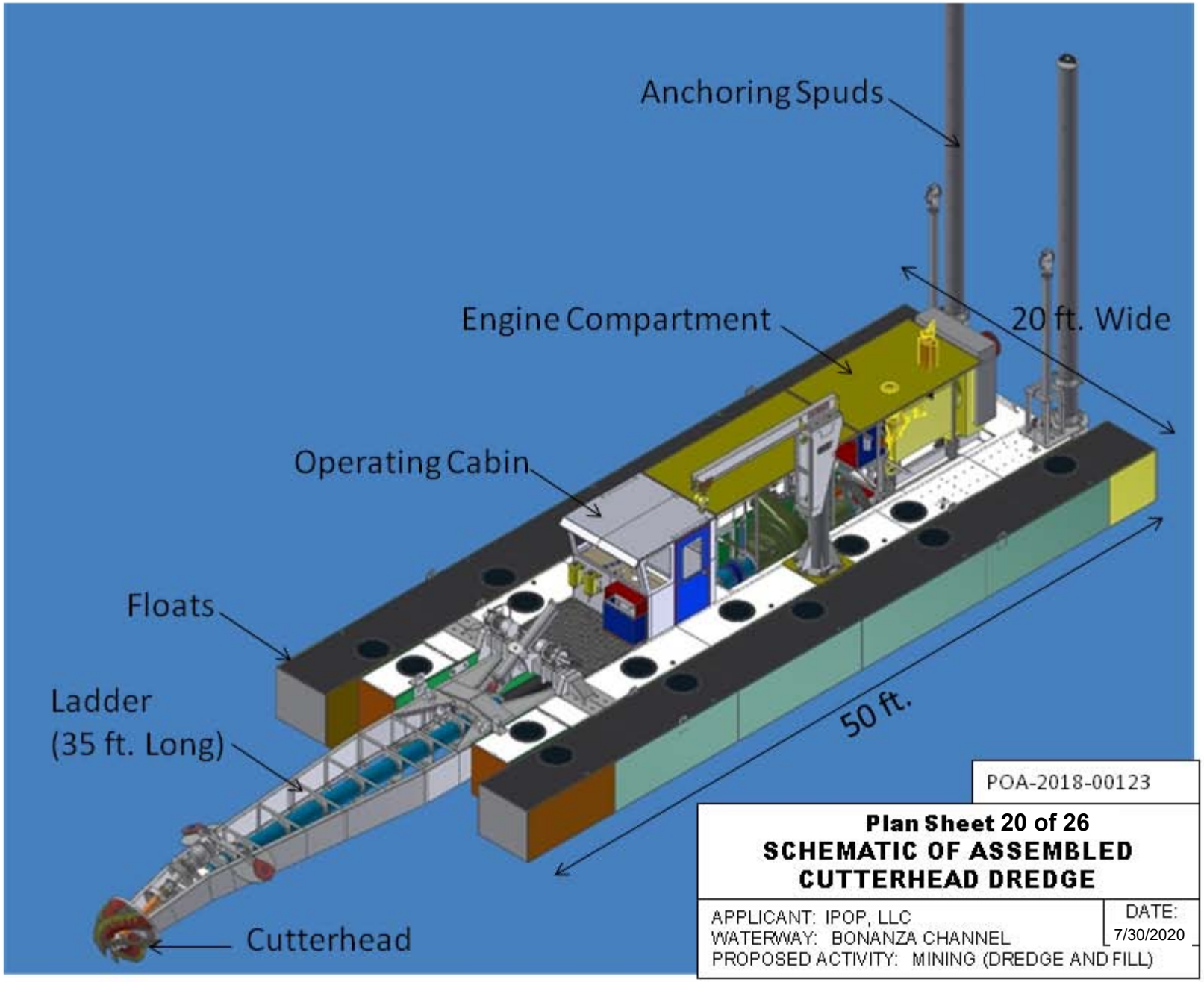
POA-2018-00123

Plan Sheet 19 of 26

SECTIONAL BARGE PLATFORM GENERAL LAYOUT

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020



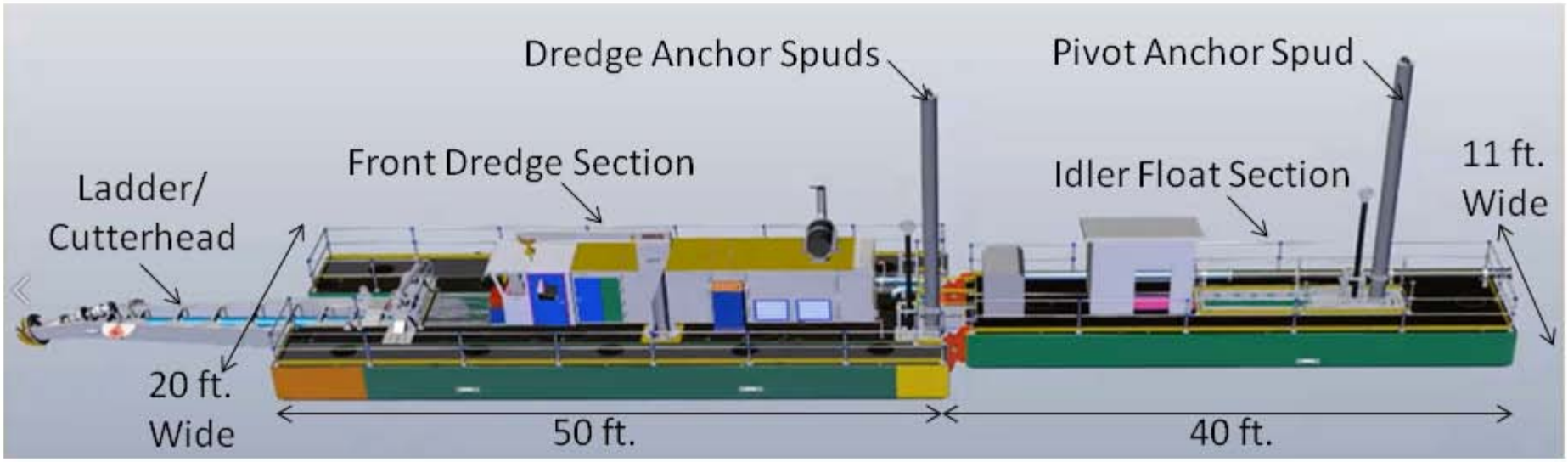
POA-2018-00123

Plan Sheet 20 of 26

SCHEMATIC OF ASSEMBLED CUTTERHEAD DREDGE

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020



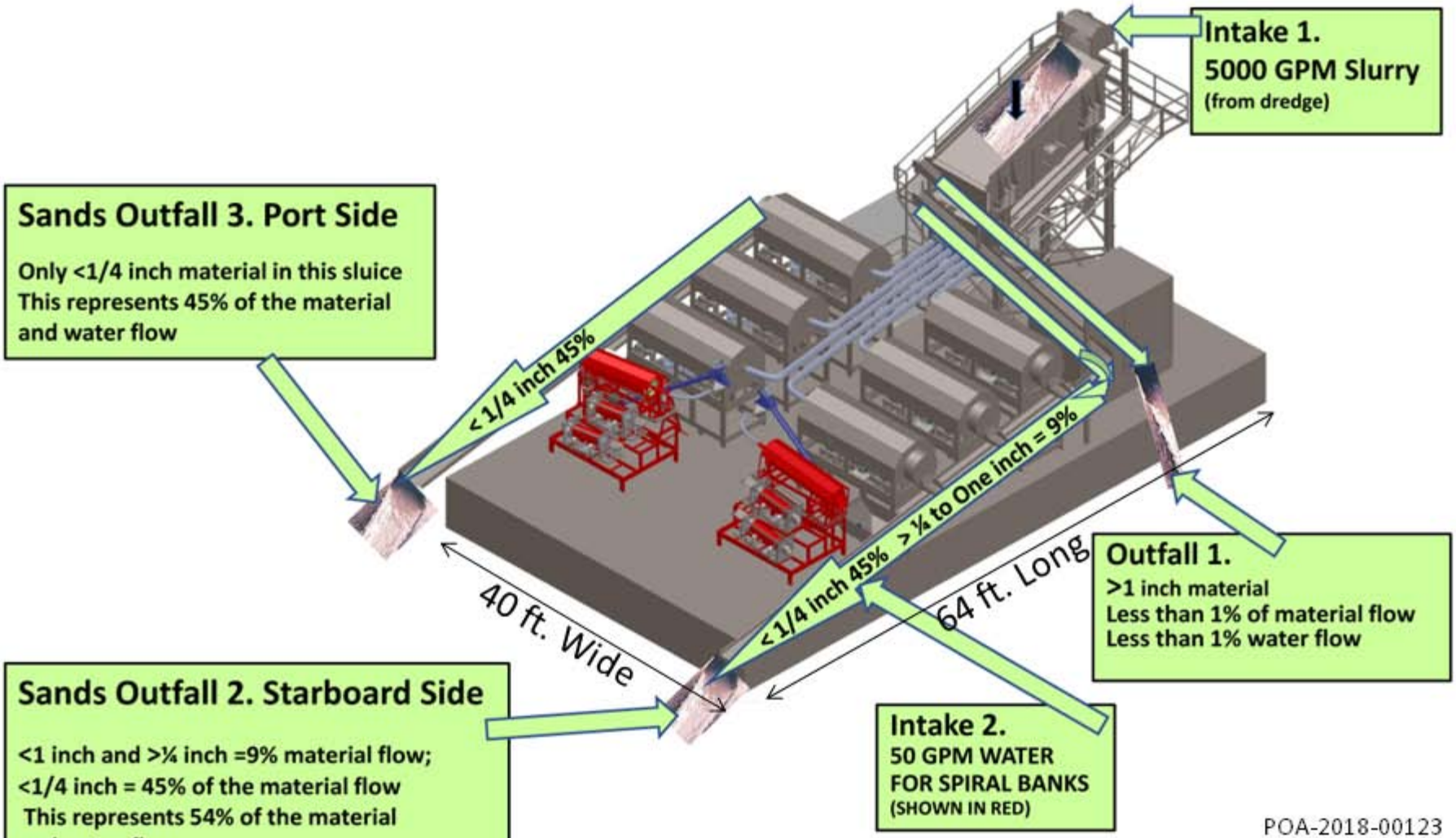
POA-2018-00123

Plan Sheet 21 of 26

ASSEMBLED DREDGE AND IDLER FLOAT

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020



POA-2018-00123

Plan Sheet 22 of 26

PROCESSING BARGE INTAKES AND OUTFALLS

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020

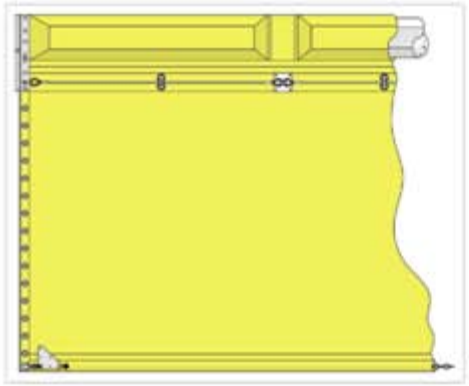
POA-2018-00123

Plan Sheet 23 of 26

BARGE TENDERS/PUSH BOATS FOR THE OPERATION

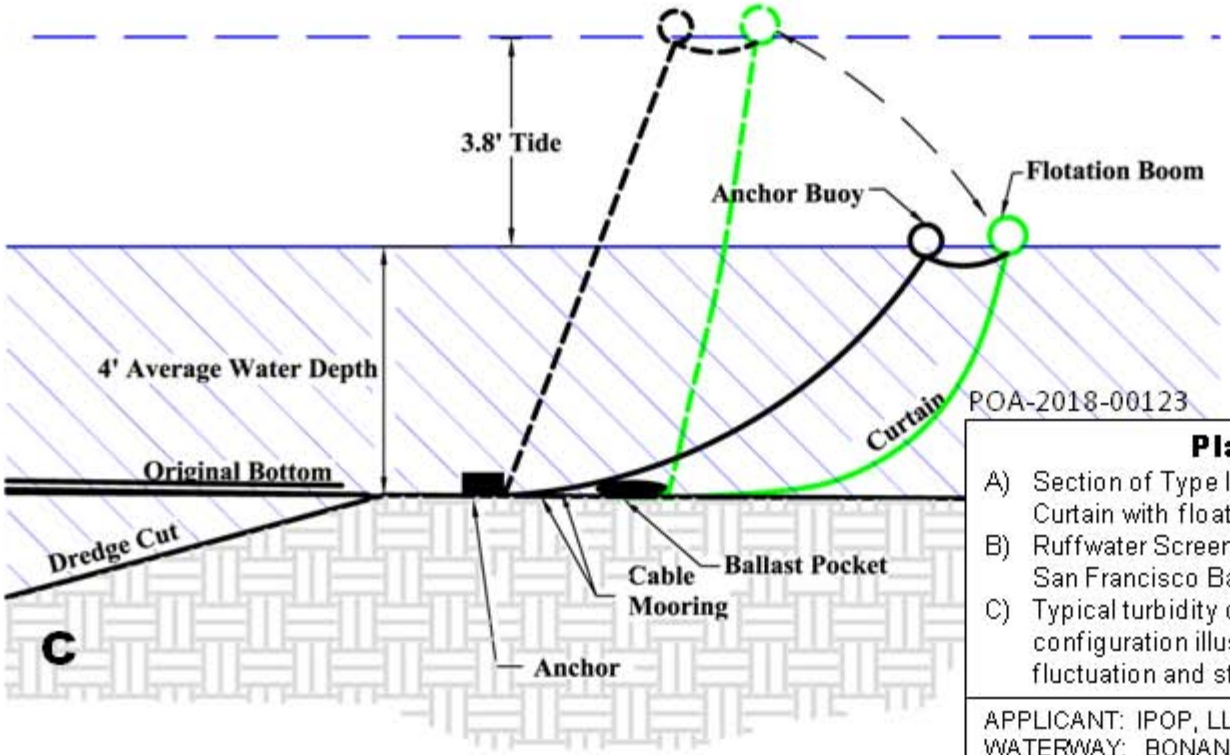
APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020



A

B



C

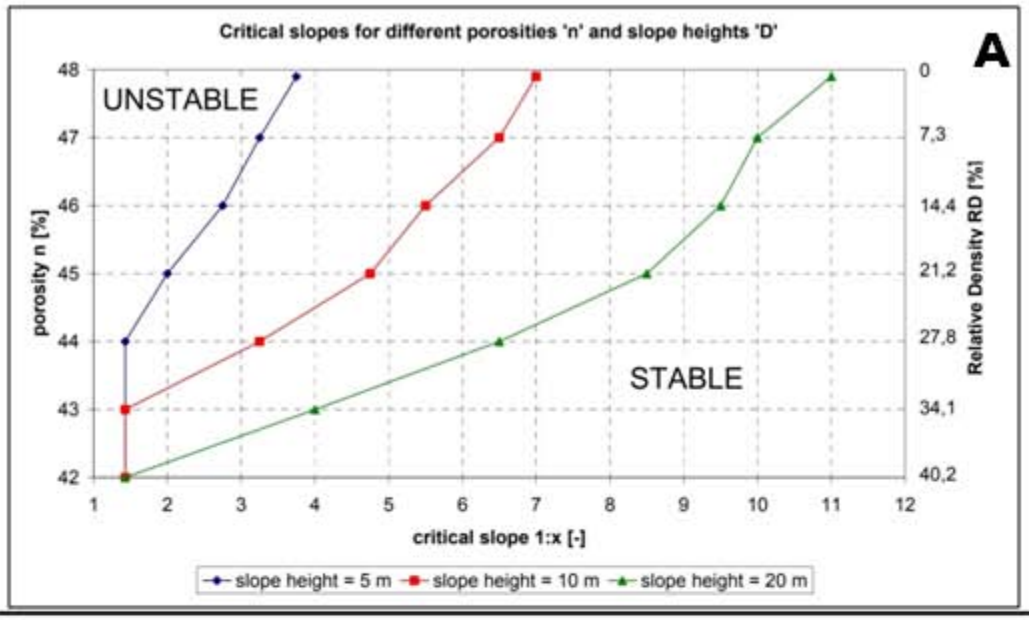
POA-2018-00123

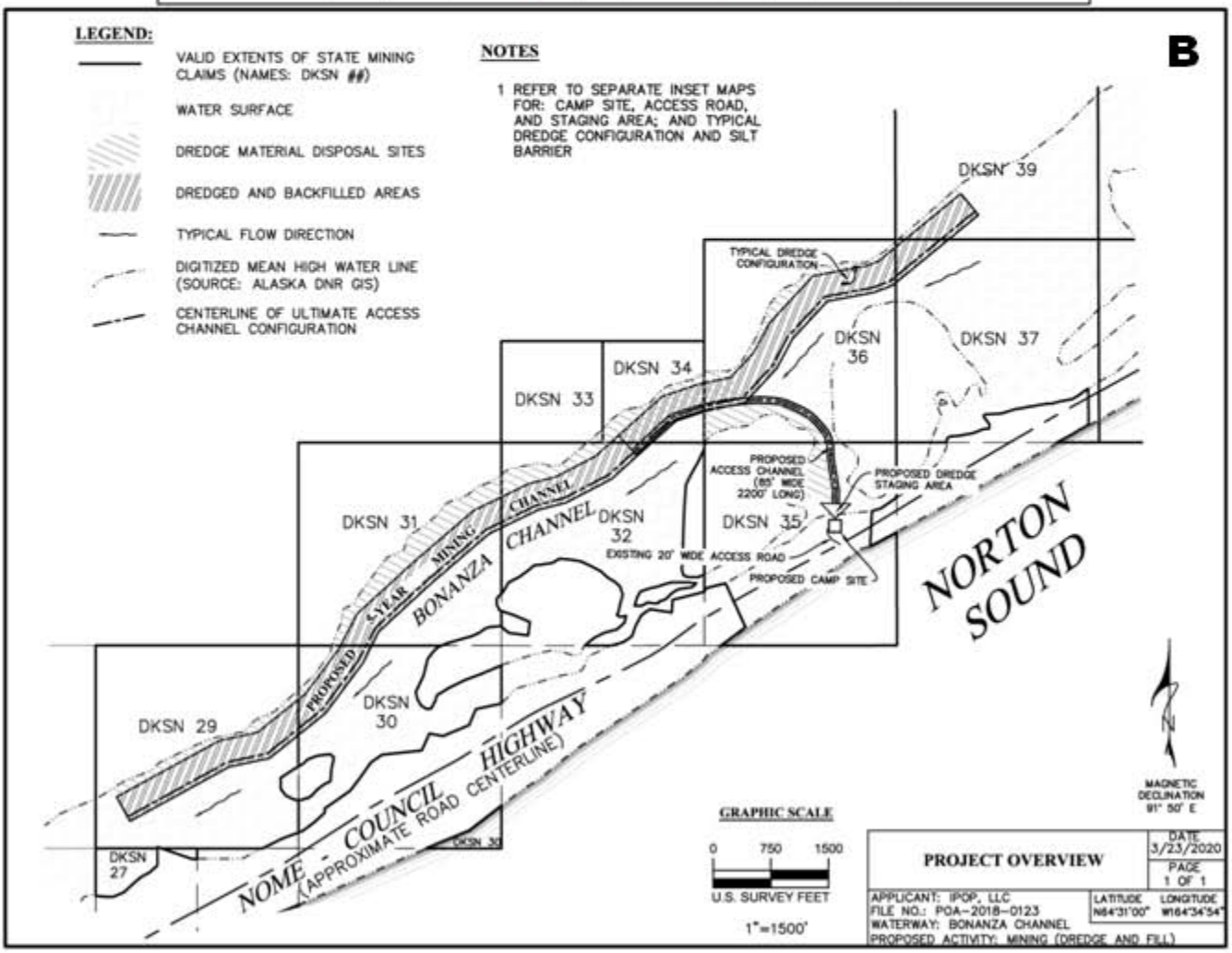
Plan Sheet 24 of 26

A) Section of Type III Ruffwater Screen Turbidity Curtain with floatation
B) Ruffwater Screen Turbidity Curtain deployed in San Francisco Bay, CA.
C) Typical turbidity curtain bottom mounting configuration illustrating safeguards for tidal fluctuation and storm surges.

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020





Plan Sheet 25 of 26

DATE: 7/30/2020

A) Critical slopes for typical dredge channels.
B) Project overview.

POA-2018-00123

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

Item Description	Acres	Storage Capacity (CY)	Dredged Volume (CY)	Bulked Dredged Volume* (CY)	Fill Type and Volume		Fill Volume Summary		
					Soils				
					Wetlands (CY)	Uplands (CY)	Wetlands (CY)	Uplands (CY)	Total (CY)
Access trench	4.2	0	33,200	35,690					
Year 1	21.7	957,346	900,000	964,404	957,346	0	957,346	-	957,346
Year 2	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Year 3	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Year 4	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Year 5	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Dredge Disposal Site A	14.6	13,666			13,666	0	13,666	-	13,666
Dredge Disposal Site B	7.1	7,019			7,019	0	7,019	-	7,019
Dredge Disposal Site C	19.7	22,977			22,977	0	22,977	-	22,977
Dredge Disposal Site Yrs 2-5	22.9	143,600			55,304	0	55,304	-	55,304
Totals	176.9	4,973,992	4,500,000	4,822,020	4,822,020	-	4,822,020	-	4,822,020

**Assuming 1.075 bulking factor*

POA-2018-00123

Plan Sheet 26 of 26

Estimated dredge and fill volumes and area acreage

APPLICANT: IPOP, LLC
WATERWAY: BONANZA CHANNEL
PROPOSED ACTIVITY: MINING (DREDGE AND FILL)

DATE: 7/30/2020

GETTING AMERICA BACK TO WORK

IPOP

2020 NARRATIVE AND PLAN OF OPERATIONS FOR THE BONANZA CHANNEL PLACER PROJECT, NOME, ALASKA

A SHOVEL READY PROJECT

2020 MINING SEASON • JUNE 1-OCTOBER 15

IPOP, a $12MM Nome area investment, is ready, willing and able to begin mining June 1, 2020. This is a "shovel ready" project, ready to spend roughly $800,000/month to benefit workers and companies in the Nome area economy. IPOP will pay a perpetual 3% mineral royalty to the state of Alaska estimated to be in the millions. IPOP waits on permits. Permits received after June 1 will result in a mining delay until the 2021 mining season.

APPLICANT INFORMATION

This section contains specific legal and corporate information about Applicant.

Corporate Information

Business Name: IPOP, LLC
Address: 9811 W CHARLESTON BLVD, #2-444, LAS VEGAS, NV 89117
Telephone: 702 460 1107
Fax: NONE
Website: NONE

President: BEAU EPSTEIN
Secretary: BEAU EPSTEIN

Corporate Officer Submitting Application
Name: BEAU EPSTEIN
Title: PRESIDENT
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Designated Contact Person
Name: William Burnett
Title: Permitting Agent
Telephone: 907-373-4000
Email: billburnett@yukuskokon.com

Alaska Registered Agent
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9309 GLACIER HWY., STE. A-201
JUNEAU, AK 99803
Telephone: 907 789 3166

TITLE PAGE

Title of Report
2020 Project Narrative and Plan of Operations for the Bonanza Channel Placer Project, Nome, Alaska

Project Location
Nome, Alaska, U.S.A.

Prepared By
William J. Burnett, P.Geo., CPG -1123, Yukuskokon Professional Services, LLC.

Contributions From:
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Jon M. DeVore, Esquire, Birch Horton Bittner & Cherot
Enigma Industries

Special Appreciation to Stakeholder Representatives From:
Bering Straits Native Corporation
City of Nome
Kawerak Inc.
Nome Chamber of Commerce
Nome Chapter of the Alaska Miners Association
Norton Sound Economic Development Corporation
Sitnasuak Native Corporation
Solomon Village Corporation

INTRODUCTION AND TERMS OF REFERENCE

Yukuskokon Professional Services, LLC. (YKPS) has prepared this Narrative and Plan of Operations for the Bonanza Channel Placer Project near Solomon, Alaska at the request of IPOP, LLC., a private U.S. company. IPOP LLC controls 100% of the Bonanza Channel Placer Project.

The purpose of this report is to provide background data for the proposed project, describe the affected environment, the land status, alternatives, and the project plan of operations.

The effective date of this Narrative and Plan of Operations is April 24, 2020.

Reliance on other experts

YKPS is no expert in legal matters, such as the assessment of the validity of the mining claims, and has relied upon client legal counsel to prepare Section 3 and advise other areas as required. Additionally, YKPS is no expert in essential fish habitat, fisheries, or endangered species and has relied upon the work of others and references as necessary. Additionally, YKPS has relied upon IPOP for any material environmental and permitting information that pertains to the Bonanza Channel Placer Project.

Frequently Used Acronyms, Abbreviations, Definitions and Units of Measure

In this report, measurements are generally reported in imperial units. Where information was originally reported in imperial units YKPS has sometimes made the conversions to metric, as shown below, specifically when reporting grades in grams, per tonne or grams per cubic meter. All assay data is in metric units. Frequently used acronyms, abbreviations, definitions and units of measure are listed as follows:

Project specific acronyms include:

ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AMHW	Above Mean High Water
AMLLW	Above Mean Lower Low Water
BCPP	Bonanza Channel Placer Project
BMHW	Below Mean High Water
BMLLW	Below Mean Lower Low Water
BMP	Best management practices
DMDS	Dredge material disposal sites
EFH	Essential fish habitat
ES	Endangered species
IPA	Initial project area
IPOP	Applicant
MHW	Mean High Water
MLLW	Mean Lower Low Water
NMFS	National Marine Fisheries Service
SPCC	Spill prevention, control, countermeasure
SPT	Standard penetration tests
USACE	U.S. Army Corps of Engineers
USF&WS	U.S. Fish and Wildlife Service

Linear Measure		
1 centimeter	= 0.3937 inch	
1 meter	= 3.2808 feet	= 1.0936 yard
1 kilometer	= 0.6214 mile	
Area Measure		
1 hectare	= 2.471 acres	= 0.0039 square mile
Capacity Measure (liquid)		
1 liter	= 0.2642 US gallons	
Weight		
1 tonne	= 1.1023 short tons	= 2,205 pounds
1 kilogram	= 2.205 pounds	
Volume		
1 cubic meter	= 0.76 cubic yards	

Currency: Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

Possible used acronyms and abbreviations

AA-	atomic absorption spectrometry
Ag-	silver
Au-	gold
cm-	centimeters
Core-	direct push core-drilling method
^{o}C-	degrees centigrade
°F-	degrees Fahrenheit
ft	foot or feet
g/t-	grams per tonne (1 g/t = 1ppm)
Ha-	hectares
Hz-	hertz
ICP-	inductively coupled plasma analytical method
In-	inch or inches
kg-	kilograms
km-	kilometers
l-	liter
lbs-	pounds
µm-	micron
m-	meters
mi-	mile or miles
mm-	millimeters
oz-	ounce
ppm-	parts per million (1ppm = 1g/t)
ppb-	parts per billion
QA/QC-	quality assurance and quality control
t-	metric tonne or tonnes

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1.0 PROJECT DESCRIPTION AND BACKGROUND

After much research and due diligence of the USGS writings Alaska mining records and other resources, IPOP LLC and its parent company, Rivers of Gold identified Bonanza Channel near Nome, Alaska as prospective placer ground because: 1) The dredges that operated in the Solomon River from 1900 to 1940's never placer mined in the general project area due to the unavailability of modern reliable pumps, 2) there were historical productive placer operations in the adjacent uplands, and 3) historical beach lines (proven to be rich with placer gold in Nome) had been identified as forming the northern margin of the Bonanza Channel and the Tidal Lagoon.

In 2018, IPOP LLC purchased claims from the State of Alaska and staked 32 claims over the estuary paralleling Norton Sound.

After lengthy delays IPOP obtained limited permits to conduct limited core sampling and test dredging on three of its thirty-two mining claims in the Bonanza Channel. Despite complex permit conditions, IPOP was able to confirm commercial significant quantities of placer gold with their preliminary exploration drilling, and now seeks permission to launch full-scale operations on the previously-permitted portion of the three claims. More generally, IPOP seeks permission to mine all thirty-two claims abiding by the operational guidelines of the IPOP permit. IPOP applies for these permits with knowledge of the challenges and burdens as a result of COVID-19. Mining has been recognized by the Governor of Alaska as an essential industry and mining remains one of the few industries to rebound quickly to help the local, state and national economies.

IPOP requests that the regulating agencies approve a permit that covers all thirty-two claims without regard to the order in which it mines its claims, subject to IPOP's compliance with its Permit guidelines and requirements including appropriate stipulations relating to river mouth avoidance for fish migration and spawning considerations.

1.1 Location

The Bonanza Channel Placer Project (BCPP) is located 24 air miles due east of Nome in the Bonanza Channel (Figure 1). IPOP claims and operations are protected from the Bering Sea by an approximate ½ mile-wide southern boundary barrier island traversed by the Nome-Council Highway (Figures 2, 3 and 4). On the north side of the Bonanza Channel are the uplands of the coastal plain. The geographic location of the BCPP is described in Table 1.1.

The area is devoid of trees. The mining areas are classified as Estuarine and Marine Wetland tidal habitat dominated by perennial plants (primarily grasses) on the Bonanza Channel uplands and barrier islands.

The area is surrounded by low hills of less than 200 feet elevation, and ridges to the north that have been sculpted by periods of glaciation. These hills are drained by the Bonanza, Eldorado, and Solomon Rivers, and various creeks that have provided source material for the river deltas and beaches that now form the Bonanza Channel coastal plain. The Bonanza and Solomon Rivers currently feed directly into the Bonanza Channel and the Tidal Lagoon where IPOP has mining claims (Figures 1-2, 1-3, 1-4).

Figure 1-1. Bonanza Channel Placer Project location

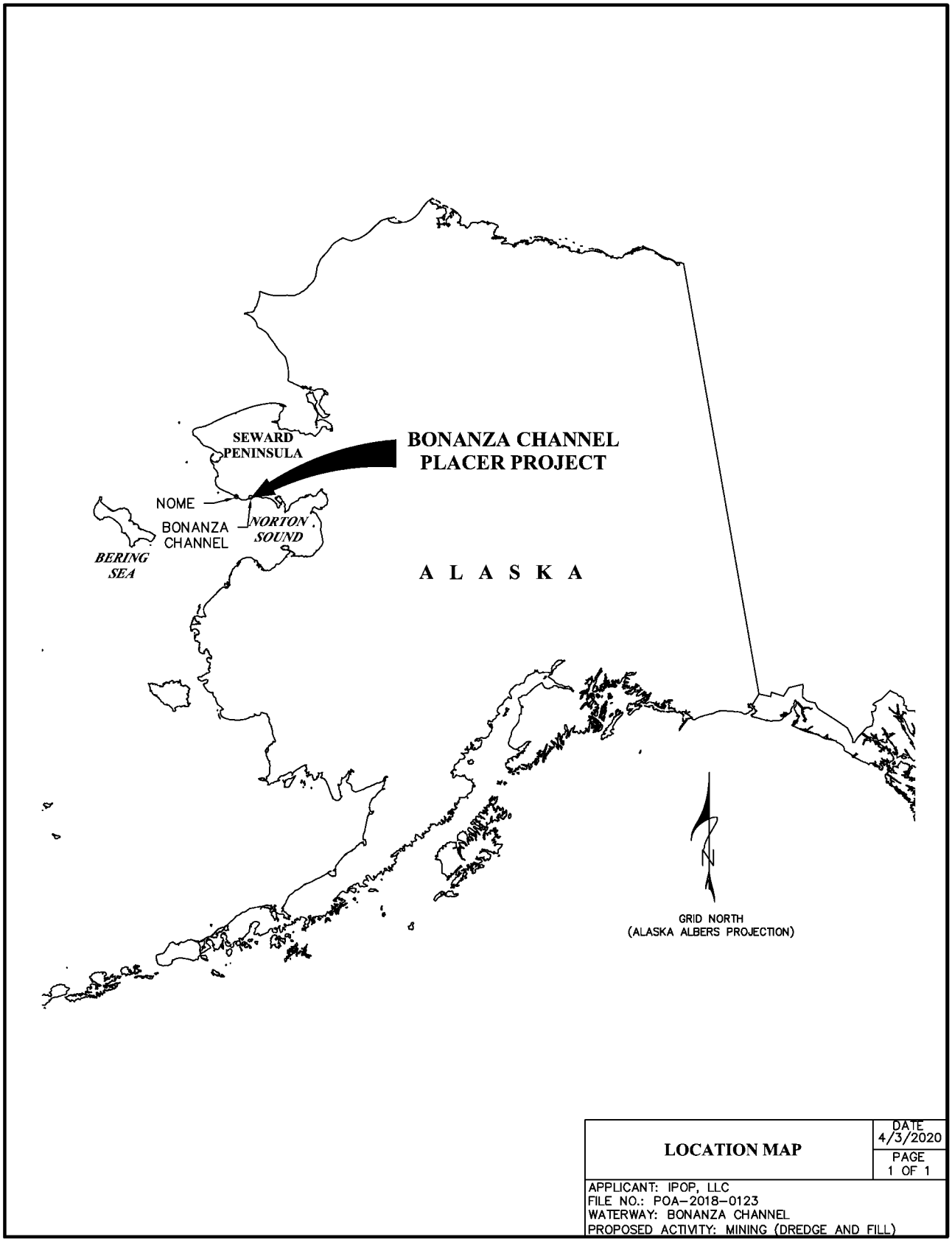


Figure 1-2. Initial project area, BCPP (graphic scale accurate, verbal scale refers to full size printed map)

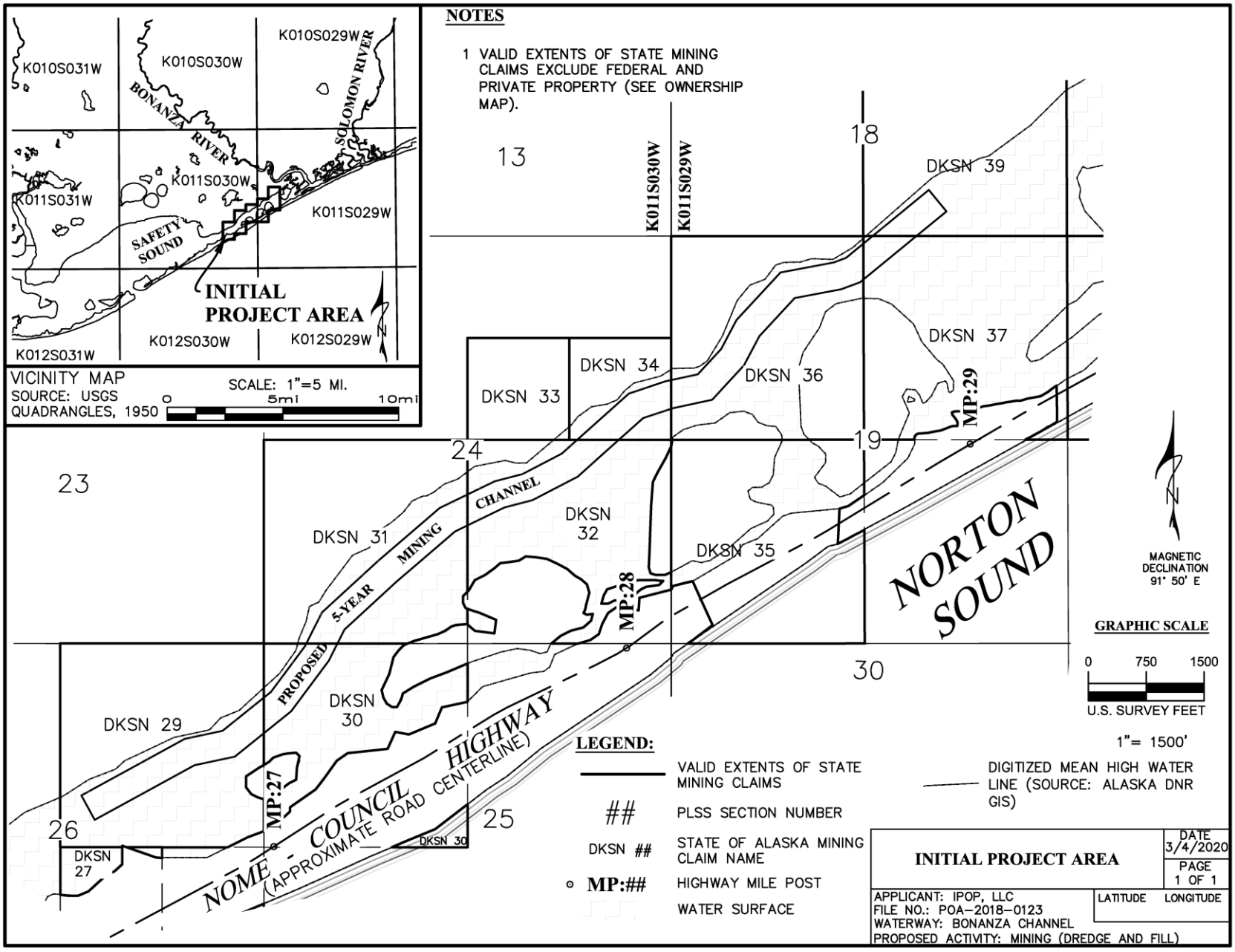


Figure 1-3. Central project area, BCPP (graphic scale accurate, verbal scale refers to full size printed map)

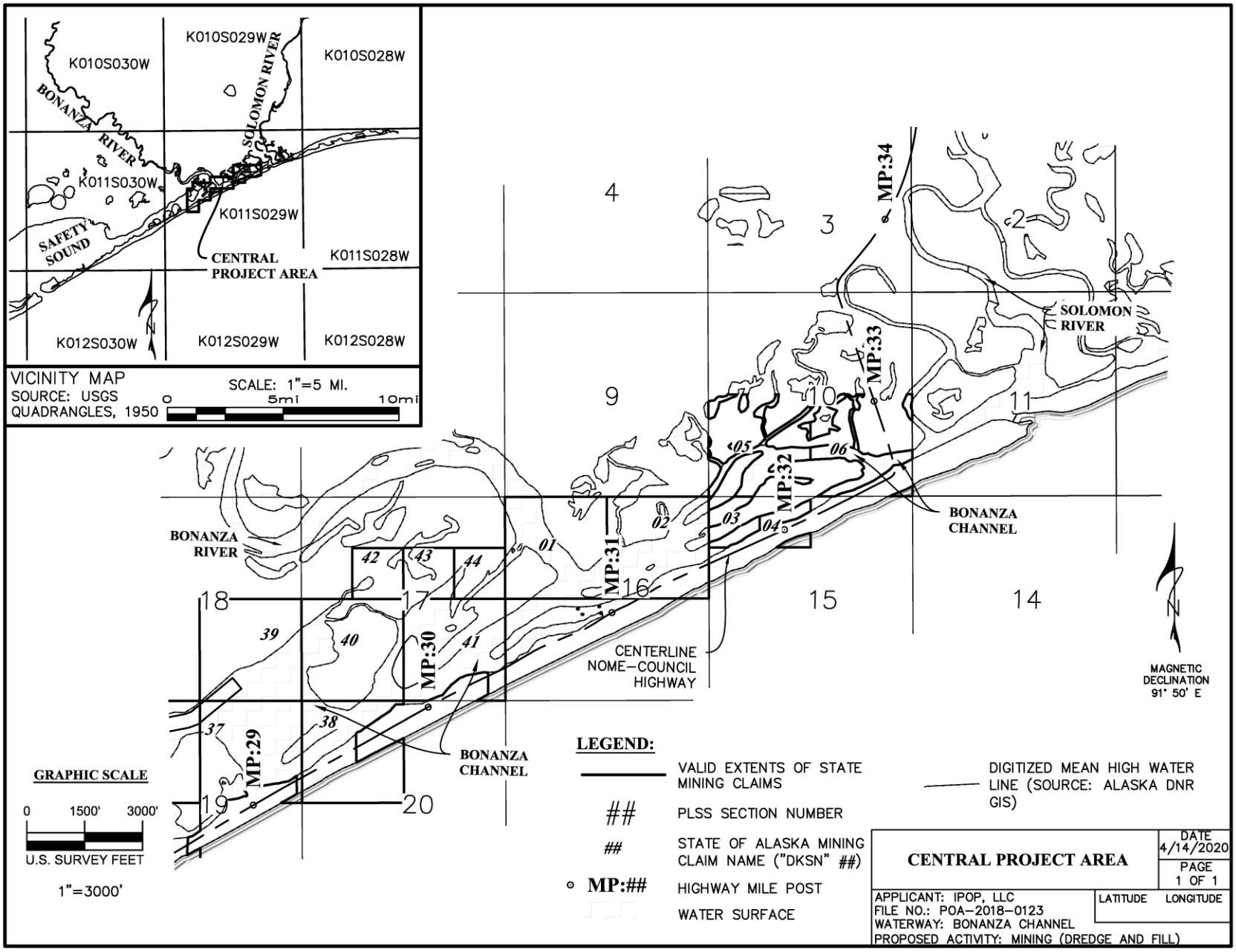


Figure 1-4. Eastern project area, BCPP (graphic scale accurate, verbal scale refers to full size printed map)

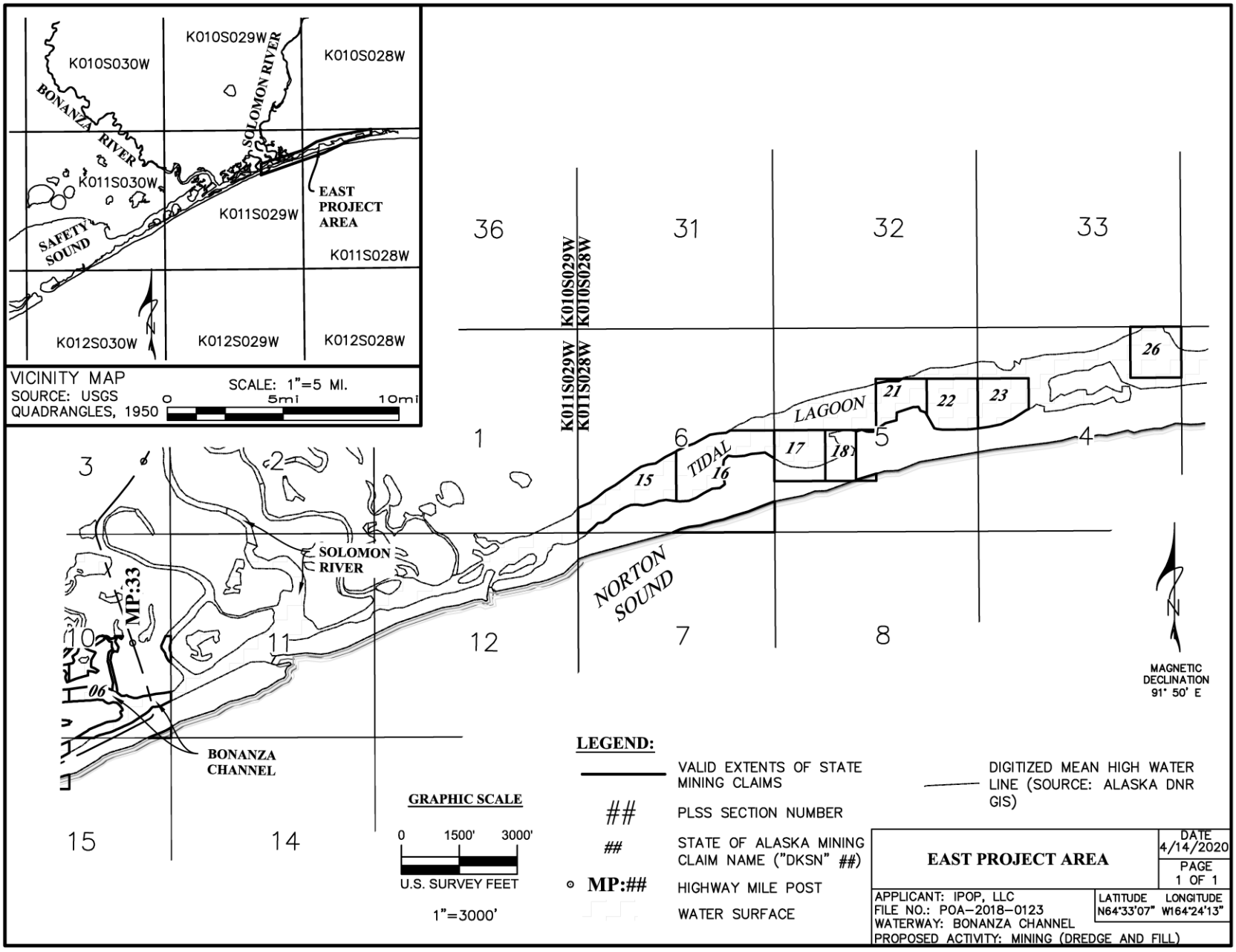


Table 1-1. Geographic location of the Bonanza Channel Placer Project

Item	Description
Bonanza Project Centroid	N64°32'28.22"; W164°27'01.03"
USGS Quadrangles	Solomon C-6, C-6 SE
Elevation	
Minimum	8 ft bmhw (various locations)
Maximum	112 ft amhw (DKSN 31)
Distance From:	
Nome	24 miles east
Solomon	1 mile south
Safety Sound	4,500 ft
Norton Sound	700-1,500 ft

amhw= above mean high water

bmhw = below mean high water

USGS = U.S. Geological Survey

DKSN = State of Alaska Mining Claim Number

The Bonanza Channel is a shallow estuary fed by two rivers, the Bonanza River and the Solomon River. Though the Bonanza Channel deepens where the Bonanza River drains into the estuary the lowest elevation observed on Applicant's claims are 8 feet below mean high water. The majority of the water portion of the mining claims is 2-4 feet below mean high water.

The flow rates in the estuary vary with respect to location and proximity to the source rivers that feed it. The majority of the Bonanza River drains to the NE of where it enters the Bonanza Channel; a small percentage of the Bonanza River volume drains slowly SW towards Safety Sound. The Solomon River drains into Norton Sound close to where it enters the Bonanza Channel and has little effect on the flow within the estuary. Both the flow of the Solomon and the majority of the flow from the Bonanza River enter Norton Sound (off the claims) at N64°32'57.96", W164°25'00.34". The waters of Safety Sound enter Norton Sound off of the claims at N64°28'20.70", W164°44'44.98".

The coastal region immediately north and bounding the proposed mining areas are rolling tundra, grasses, shrubs, persistent emergents, emergent mosses and other perennial plants consistent with large freshwater emergent wetlands.

The general project area is 28 miles east of Nome and is accessed from the Nome-Council Highway at Milepost 28 (usually open June through October), snowmobile (during winter and spring), helicopter, bush plane, or by boat from Norton Sound.

The surrounding area is very sparsely populated (10 people in 2010 census) consisting of the small, mostly seasonal community of Solomon which is 10 miles away at Milepost 38 and Council which is 44 miles away at Milepost 72.

1.2 Mining History

Like Nome, this area of the Seward Peninsula has considerable mineral endowment, consisting primarily of gold with some silver and other metals. The Seward Peninsula has been mined periodically for gold since gold was discovered in Council in 1897 and Anvil Creek in 1898, marking the beginning of the

Nome Gold Rush (Werdon et. al., 2005, Collier et. al, 1908, Brooks et. al, 1901). Gold mining on the peninsula has been from both from placer deposits in rivers and streams such as the Solomon River and Anvil Creek, and from beach placer deposits like those around the City of Nome and Bluff, and from lode deposits (like Big Hurrah and Rock Creek Mine).

The two primary mining districts on the Seward Peninsula are the Nome District where over 3.6 million ounces of gold production is recorded (mostly from placer deposits) and the Council-Solomon "District" (formerly Solomon and Bluff with Council being its own District) where over 1 million ounces of gold production has been reported (mostly from placer deposits) (Werdon et al., 2005). The largest production from a lode deposit was reported to be ~27,000 ounces mined from the Big Hurrah Mine ((Reed & Meinert, 1986) located within the Council-Solomon District, 5.6 miles from the nearest point on the IPOP Bonanza Channel Project. Due to extensive alluvial and colluvial cover and generally poor bedrock exposures in the surrounding hills, significant potential remains for discovery of similar lode deposits and sources for the rich Solomon and Ophir placers (Pink, 2011).

The Solomon River placers are described in ardf.wr.usgs.gov (specifically SO015 and others). Placer gold was mined here from 1903 (Collier, et. al, 1908) through 1963. The lower Solomon River area was mined by bucket-line dredges to within 2-1/2 miles upstream of the general project area and produced an estimated 125,000 ounces, where it is said that they stopped because they could no longer reach the bedrock with the machinery as they approached the sea and because they had reached the limitations of water delivery systems and could no longer supply the hydraulic forces necessary to separate gold from the river sands and gravels. As a result, no large-scale production mining ever occurred in the general project area.

The most notable placer deposit within the Council-Solomon district is Bluff, located approximately 35 miles further to the east along the beach from the general project area. This particular beach placer is said to be the richest placer gold deposit on the Seward Peninsula, (and possibly the world) per yard of material (Collier et. al., 1908). Bluff is adjacent to lode gold deposits where production was negligible, but the value of the gold in the beach placer was reported to be far richer than the richest beaches famously mined along the beaches of Nome (Brooks et. al, 1901).

1.3 Project Description

The BCPP is planned as a simple, low impact mining operation that will dredge for placer gold within the sediments of the Bonanza Channel. The proposed operation will: 1) provide a substantial multi-million dollar economic benefit to the community of Nome and Alaska, 2) have no significant environmental impact, 3) pose no substantive risk to fish, marine mammals, or wildlife, 4) co-exist peacefully with subsistence activities in the area 5) and most importantly leave no visible footprint.

The project consists of a 4 trailer mobile camp (to house workers) that will be parked on lands owned by the State of Alaska adjacent to the Nome-Council Highway.

There will be two small tender boats 25 feet or less, a cutterhead dredge (designed to operate in shallow estuarine waters) and a processing barge (designed to capture very fine gold particles). The project will be a seasonal summer/fall mining operation within the waters of the Bonanza Channel and the Tidal Lagoon with annual winter-time core drilling (exploration) from the ice once the channel and lagoon have frozen solid.

The project will be serviced by road from Nome, Alaska.

1.4 Project Summary Information

- Annual mining activity window June 1 – November 1
- Annual winter drilling activity window January 1 – May 31
- Project operating life of over 10 years.
- A total of over 9,000,000 cubic yards of material to be mined over the life of the project.
- Mining/processing rate of up to 900,000 cubic yards of material per year.
- Mining depth of 31 feet.
- Reclamation concurrent with mining, with temporary dredge material disposal sites reclaimed by the end of the project.
- No introduction of chemicals or toxic metals.
- Mining/dredging site accessed by a 2,150 - 4,500ft-long access channel that will be maintained and/or re-established annually.
- A one-acre camp site located down a 330ft-long access road, north of the Nome-Council Highway.
- 20-man, self-contained, temporary mobile camp powered by two 55 kilowatt (kW) generators.
- On-site temporary fuel storage consisting of a 3,124-gallon double wall fuel tanks for diesel and a single 792-gallon double walled gasoline tank.
- Double walled 1,240-gallon fuel transport/refueling tank mounted on one of the push boats.
- Project dredge operating schedule of two 12-hour shifts per day for an average of 20 weeks per year during a seasonal mining activity window June 1- November 1.
- Occasional seasonal winter delineation drilling schedule for 30 continuous days during the drilling activity window January 1 – May 31 per year for the purpose of directing annual mining with the aim of minimizing the environmental impact.
- Employment of 20 to 40 personnel for operations and seasonal start up, respectively.

1.5 Purpose and Need

The permit applicant's stated purpose for the BCPP (as required by the USACE to assess alternatives for the Clean Water Act 404(b)(1) evaluation) is: *To economically produce gold from IPOP's mining claims on the Bonanza Channel and Tidal Lagoon using proven technologies that are specifically designed for shallow water estuary dredging and ultra-fine gold recovery.*

The need for the BCPP is three-fold: *1) To provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, 2) to provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments, and 3) to develop and operate a gold mining project in Alaska in order to meet current and future demand for the metal.*

1.5.1 Socio-Economic Need

There are three major industries currently serving Nome, Alaska: Mining, commercial fishing, and tourism. Throughout the history of Nome, mining has continued to have the most impact on the Nome economy. Nome was founded on the economic importance of gold in the region, producing millions of ounces of gold during its 122 years of exploration and mining history. Although gold continues to be mined today, the shut-down of the Rock Creek Mine and other local smaller-scale operations have reduced

the demand for transportation, housing, goods and services. As a result, Nome and the surrounding communities have been hit hard economically. As of March, 2019, Nome had a population of 9,869 people, an unemployment rate of 11.9% (far above the average U.S. unemployment rate of 3.7%), and an average cost of living that was 14.9% higher than the U.S. average. IPOP's annual payroll and services during operations will be in excess of $3,000,000 per year.

Given the incredible resource-rich value of the Bonanza Channel sands coupled with the immense volume of potential ore in the general project area, the BCPP is expected to provide at minimum 10 years of positive socio-economic benefits to the city of Nome and the surrounding communities. These benefits will have a multiplier effect with regard to education, health and employment levels in the surrounding communities.

In 2018 alone, applicant has spent $2.87 million in Alaska in support of this project. IPOP projects that when operations are permitted this project will contribute up to $45 million in local taxes and $520 million in payroll and other goods and services over a 10-year period. Additionally, Applicant's shareholders are expected to bring an additional $1,000,000 to Nome businesses and tourism.

1.5.2 Alaska Economy Need

According to the Alaska Journal of Commerce, Alaska's economy is "sluggish" after three years of recession. With oil giant BP leaving the state, and continued uncertainty over the State budgets in the years ahead, the total effects on Alaska's economy are unclear.

What is clear is that Alaska is in need of more revenue to fill its budgetary shortfalls. Projects like the the BCPP will do just that, providing a projected royalty as high as $7 million to the state annually (using the three-year average gold price).

1.5.3 Need to Meet Current and Future Demand for Gold

Gold is important for providing economic backing for most economies and is considered a safety factor for global economic stability. Gold is also critical to jewelry, medicine (treatments for cancer and arthritis), electronics (smart phones, computers, etc.), aerospace engineering, nanotechnology, environmental control and protection. Without gold the satellites we rely upon for communication, defense, environment, etc. would fail. Without gold everything from ATMs to modern vehicles and airplanes would be inoperable. Virtually everything in our modern world is dependent upon gold.

The BCPP is forecasted to produce millions of ounces of gold and contribute to the current and future demand for this metal.

2.0 AFFECTED ENVIRONMENT

Because the operation is within an estuarine environment regarded by regulators as sensitive, the operation has been designed for avoidance and minimization of the environmental impacts to water bodies, wetlands, wildlife, special aquatic sites, areas of historical or cultural significance, and addressing the subsistence and other stakeholder concerns for operations within the Bonanza Channel and the Tidal Lagoon.

As designed, the project will meet or exceed local, state, and federal regulatory requirements. The following are some aspects of the project that support IPOP's position that there will be minimal environmental impact caused by the BCPP:

- The Project plan for the first five years is to mine the top 30 feet of the Bonanza Channel and Tidal Lagoon estuaries. This significantly reduces the footprint of the overall project as compared to mining at a shallower depth. Applicant reserves the right to seek approval to mine to greater depths if warranted by gold content, dredge capability and recovery.
- The mining operation within the estuary will be restricted to an area of 15 acres or less at any one time (or less than 0.1% of the 15,000 acres of habitat classified as the Bonanza Channel Estuarine System).
- The plan is to mine with concurrent reclamation, re-establishing the estuary as close to the original pre-mining extent and depth as possible, with the exception of the access channel through the center of the mining channel what will be left at 10 ft. BMHW to provide ecological enhancement to the waterway.
- The project will not use any chemicals.
- The operation will not create treatable waste water.
- The operation will operate entirely within its own containment area, thereby minimizing or eliminating turbidity effects of the remainder of the water body.
- The operation will incorporate the use of real-time monitoring devices to measure, record and notify the operator of excessive turbidity levels.
- The use of a turbidity curtain for containment will also isolate the project from fish.
- The project will be operated within strict accordance to the rules and best management practices as set forth in the project's standard operating procedures (SOP) that include but are not limited to:
    - Safe fuel handling
    - Additional pre-season site surveys and photographic inspections for eelgrass
    - Continuous wildlife and fish monitoring within the mining area
    - Continuous turbidity, conductivity, current, tidal and weather monitoring within the mining area
    - Strict maintenance and operation of the turbidity curtain containment area perimeter.
    - Strict adherence to speed limits both with trucks and other vehicles on the local roadways and with boats within the waters of the U.S.

- To address the concerns of The City of Nome that of the operation might adversely impact bird watching by tourists IPOP's machinery has been designed to operate at or below 80 decibels (dB).

- The in-water portions of the project will use temporary infrastructure that will be established at the beginning of each mining season and removed at the end of each mining season; provided, however, the support barge will be winterized (removing all fuel and other potential contaminants), and secured for overwinter storage within the operating area.
- All gray water and sewage generated by the operation will be secured on land and removed from the operating area weekly.
- To address concerns of adjacent property owners about potential trespass, the project will be operated within and accessed from lands owned by the State of Alaska only.
- IPOP will acquiesce in use by the public of its boat launch ramp for subsistence hunting and fishing.

In addition to protecting the environment, IPOP intends to manage its operations in a way that will be beneficial to the environment and ecology of the area by:

- Monitoring operations and collecting environmental and biological data that can be used for planning and management of the general area by State and federal agencies.
- Creation of new shallow areas that may occasionally be exposed as sand or mudflats, that may be colonized by beneficial microorganisms and could potentially serve as habitat for water birds, shorebirds and seabirds.
- Potentially increase the channel depth through dredging to improve the area for fish passage and establishing and environment where wild eelgrass beds may take root (IPOP has conducted extensive drone-based investigations of the operating area and has established that the nearest eelgrass bed is in Safety Sound, more than three miles away from the nearest claim). This 4K resolution drone footage has been previously provided to regulators along with a narrative statement concerning the absence of eelgrass, and will continue to be available for review. In particular, there is no eelgrass presence in DKSN 29-39 or in the proposed access route to those claims.

2.1 Other Resources

The Bonanza Channel is an area considered rich in mineral and other resources including fish and wildlife that residents of the nearby communities may use for both subsistence and tourism. The project is designed to protect these wildlife resources to the fullest extent possible.

2.2 Watershed and Wetlands

The Bonanza Channel and the Tidal Lagoon are the terminus of a vast watershed consisting of the Bonanza and Solomon River drainage systems. The Bonanza Channel comprises approximately 15,000 acres of habitat generally classified as E1UBL,[1] the components of which are:

- E: The Estuarine System consists of deep-water tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the

[1] A shallower classification code E2EM1P is applied to some areas of the Bonanza Channel, which is supposed to relate to areas "characterized by erect, rooted herbaceous hydrophytes" of a persistent nature (the "EM1" portion of the National Wetlands Inventory Description), but the harsh conditionsin the Channel , particularly ice scouring, prevent the formation of persistent vegetation.

open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water.

- 1: Subsystem Subtidal, substrate in these habitats is continuously covered with tidal water (i.e., located below extreme low water).
- UB: Class Unconsolidated Bottom includes all wetlands and deep-water habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.
- L: Water Regime Subtidal involves tidal salt water which continuously covers the substrate.

Contemporaneous restoration activities will ensure that IPOP's mining operations will cause no long-term adverse effects to the operating area's wetlands.

2.3 Fish and Wildlife

Fish. Fish species of the Bonanza and Solomon Rivers that feed the Bonanza Channel include: anadromous species of Dolly Varden, chum, Chinook, pink, coho salmon, and resident fresh water species of Arctic grayling, burbot, whitefish and northern Pike.

Saffron cod are known to present in two locations during the winter months when the fresh water starts to freeze and the salinity increases creating feeding areas for this fish. One location they are found is in Safety Sound approximately 1 mile from the nearest claim, and the other is near the Solomon Bridge near claim DSKN06.

There will be no dredging in, or impacts on, anadromous streams by the proposed mining operation. There are no anadromous fish spawning beds in the Bonanza Channel. The Bonanza River is a marginally productive anadromous system with small runs of salmon. Alaska's Department of Fish & Game acknowledges a dearth of scientific studies or data concerning the effects of estuarine or marine turbidity on salmonid species and whether or not turbidity would interfere with the migration of anadromous fish (Green, 2019). While there is no evidence that turbidity events in the estuary would form a barrier to the migration of anadromous fish in and out of the River or otherwise adversely affect them, and the scope of operations will leave large undisturbed corridors adequate for passage of salmon and resident fish to bypass the operation, undisturbed.

Exhibit 3 hereto is a draft Essential Fish Habitat Assessment for a portion of the project claims that include two claims within the initial project area (IPA) finding that the proposed mining activities in this plan of operations would not adversely affect essential fish habitat (EFH).

IPOP notes that even if turbidity did periodically impair migration, suction dredging enhances the food supply and water oxygenation. Suction dredging in other analogous habitats has been shown to attract fish and birds to feed on benthic organisms present in the discharge.

Dredge operations are only feasible when the water is open and ice-free and, therefore, will not occur concurrent to the presence of saffron cod which are present only when the area is ice-bound.

Birds. Littoral habitats of the Bonanza Channel area are used by tens of thousands of birds each year. The Audubon organization named this area one of the "Important Bird Areas" of North America due to the huge numbers of diverse species of birds that migrate north at different times to feed, breed and nest

from spring to fall. Early spring marks the time that large numbers of loons, waterfowl, shorebirds and gulls return to this area to feed in the mudflats, breed and begin nesting. Notable bird species that use this area include:

- Brant and common eiders that can include king, and rarely observed spectacled and Steller's Eiders. Eiders more commonly use the marine waters in the spring.
- Tundra Swan.
- Canada Goose, snow goose.
- Sandhill Crane.
- Various ducks (Northern pintail, greater scaup, American wigeon, long-tailed duck, red-breasted mergansers, green-winged teal, gadwell, Eurasian wigeon, ring-necked, and tufted ducks.
- All 5 species of loons (red-throated, Arctic, Pacific, common and yellow-billed).
- Shore birds include western sandpiper, rock sandpiper, red-necked phalarope, red phalarope, least sandpiper, semipalmated sandpipers, red-necked stint, dunlin, long-billed dowitcher, Black turnstone, lesser sand-plover, and ruff sandpipers.
- Arctic and Aleutian tern colonies (documented colonies in Safety Lagoon (Aububon.org, 2013)).
- At least 6 species of gulls.
- Lapland longspur and Savannah sparrow.
- Birds of prey (Peregrine falcons, long-tail jaegers and parasitic jaegers) feed on the songbirds, shorebirds and the eggs all summer.

While most of the migratory birds pass through this area on their spring migration, some stay for the summer. Swans are common in Bonanza Channel in the spring and fall, breeding swans move to upland ponds to nest and raise their young.

Because IPOP's dredging operation is quiet, it is not expected to disrupt or displace normal bird activities such as breeding, nesting or rearing in the general area. None of the mining or support operations will be on the grassy shores or the upland areas and ponds. IPOP's operations will not affect nesting birds. IPOP will not be dredging mudflats, and therefore will not adversely impact sand pipers or other shorebirds, seabirds or other waterfowl.

IPOP anticipates that in the dredge disposal sites, rapid colonization of micro-organisms typically found in mudflat ecosystems (and also an important food source for water birds, seabirds and shorebirds), will occur If so, this could potentially provide new feeding habitat for Sandpiper and other birds feeding in this area, and likewise provide new hunting grounds for birds of prey

Other Wildlife. The general project area contains no notable population of moose or musk ox, but small rodents, arctic and red fox and arctic ground squirrels are sometimes seen in the general project area. Winter wildlife includes various species of seals in the open ocean and occasionally they may follow tomcod into the deeper portions of the Bonanza River or in Safety Sound.

Summer mining will not negatively affect any of these species, and because mining will not take place during the winter months, the operation will not affect seals or polar bears

Exhibit 1 is an environmental report previously prepared by Michael Travis of Travis/Peterson Environmental Consulting in connection with the permitting of the activities within DKSN 29-39, not

including attachments. The data upon which he relied is generally applicable to the entire range of IPOP's claims and confirms that other species of interest are rare or non-existent in the area, making potential impacts on these species of regulatory significance. Listed polar bears (Ursus maritimus) are not present in the summer operational months, and sightings of Steller's eider (Polysticta stelleri), and spectacled eider (Somateria fischeri) are rare.

2.4 Eelgrass

IPOP has conducted an extensive photographic investigation concerning the presence of eelgrass beds, focusing on DKSN 29-39. Drone footage, coupled with boat-based ground truth investigations, has confirmed that the nearest eelgrass bed is in Safety Sound, more than three miles away from the nearest claim. Details of IPOP's eelgrass study can be found in Exhibit 2.

2.5 Resource Interrelationships

The resources of the general area include fish, waterfowl, other wildlife and eelgrass. Estuaries provide the ecosystem for all of these resources as well as providing nursery areas and protection from storm events.

Native Alaska representatives state that they have historically relied upon the Bonanza Channel area for subsistence hunting and gathering. The Nome-Council Road also provides access for local residents who occasionally use this area for recreational hunting, fishing and subsistence food gathering.

The Bonanza Channel area also supports a bird watching industry. Many bird watchers visit the area in May and June to view some of the over 200 migratory species of birds that pass through this area. This area is considered by the State of Alaska Department of Fish and Game as one of the top ten bird viewing spots in Alaska on the basis of accessibility and abundance of a variety of birds.

IPOP's activities will have a negligible impact to the wildlife resources of this area because:

- Mining and subsistence can coexist in the Bonanza Channel.
- IPOP's operational footprint is small.
- The sound level for the machinery will be quieter than a typical over road truck driving down the Nome-Council Highway.
- The dredge is a slow-moving piece of equipment that will be standing still most of the time.
- All boats will observe slow speed limits and not cause wakes that might disturb fish or birds.
- Best management practices will be employed to protect the estuary.

2.6 Traditional Ecological Knowledge

Traditional knowledge includes contemporaneous observations by local residents and their recollections of climate conditions, animal populations, and changes brought about by development of the region, including placer mining, roads and commercial fishing. IPOP is committed to engaging and collaborating with the local residents and other stakeholders to create a positive impact for all from dredging in the Bonanza Channel. In particular, IPOP acknowledges that Kawerak, Inc., a regional non-profit, tribal consortium of the Bering Strait Region representing 19 tribes, is the primary advocate for protecting the Bonanza Channel for subsistence by members of the local tribes.

2.7 Climate Change

Rising sea levels in the Bonanza Channel area as a result of climate change may be expected to affect flooding of the uplands and mudflats. The increased frequency and intensity of storms from climate change could change the freshwater input in the headwaters of the watershed. Increased flooding in the estuary and could exacerbate sedimentation or, in some cases, remove sediments and nutrients and cause turbidity. These effects of global warming could alter the geomorphology of the estuary (such as removal or addition of mudflats, erosion of uplands and barrier islands) altering the habitat, biological processes and the estuarine ecosystem, inducing complex outcomes for the biota.

In estuaries, storm pulsing provides not only benefits to the biocomplexity of the ecosystem, but they also can be detrimental. Storms can reduce wetlands locally through mortality, alter wetland productivity for long periods beyond the extent of a storm event, alter salinity in the water and soils, and cause ecosystem state changes (Day, et al., 2008). Special aquatic sites that fisheries rely upon may be lost over time with intertidal wetlands loss as a result of these storms due to climate change.

In the case of the Bonanza Channel, current storm events have allegedly become less predictable and more intense with time and occur on a more random frequency than in the past. Storms have periodically washed out the Nome-Council Highway in several places and flooded the highway near the Solomon Bridge, submerging uplands to 6.8 feet above mean high water (AMHW) when driven by southwest winds. Conversely, when storms blow in from the northeast, the winds can blow nearly all of the water out of the Bonanza Channel, creating vast sandbars and mudflats.

The negative effects of global warming are well documented for song birds in the U.S. and for waterfowl. Habitat for shorebirds, seabirds, and water birds is slowly diminishing world-wide as a direct result of global warming and sea level rise.

Local residents contend that recently there has been less snow and ice than there has been historically. Salmon productivity has decreased locally as well which might be attributable to global warming. Diminishing sea ice induces seals (that depend on the ice for resting, mating and birthing their offspring) to relocate.

Polar Bears that once were seen in this area have migrated north because of declining sea ice, (necessary for hunting seals) that has reduced if not eliminated their presence in Norton Sound.

The mining activities as proposed will not cause sea levels or rivers to rise, and will not cause storm events or reduction of sea ice. Although emissions from IPOP's operations will create a small carbon footprint, IPOP will not engage in blasting, significant haulage equipment or rock crushing, grinding and processing circuits that creates fugitive dust pollution.

2.8 Incomplete and Unavailable Information

IPOP has specific protocols and systems in place that will disseminate information as mining and reclamation happens and anticipates that it may have to alter its plans annually to address any unsupported assumptions contained in this application. Relevant data will continue to be collected during the course of mining. This data will be incorporated into subsequent plans and application amendments for the benefit of State and Federal environmental agencies. Incomplete or unavailable information at the time of this application are:

- Tides. Applicant has relied on State and Federal short or long-term tidal influence data.
- Water Level History. Data on depth of water in the general project area as it relates to weather is non-existent.
- Flow/Current. The water current the area of the mining is highly variable with respect to depth and location across the channel. Though Applicant has measured flow in specific locations, they are site-specific measurements and may not be 100% representative of the entire width and depth of the Bonanza Channel.
- Water Volumes. Water volumes (acre feet) through the Bonanza Channel per day or month are not known.
- Conductivity. Data with respect to salinity layering in the channel, or salinity changes due to storm events or tides does not exist within Bonanza Channel.
- Background Turbidity. The turbidity of the estuary is affected by winds and storms, seasonal runoff and tides and as such background turbidity levels are highly variable. Although some turbidity measurements have been taken by Applicant, no long-term real-time turbidity measurements for the Bonanza Channel exist.
- Mining/Dredging Turbidity. A thorough turbidity plume test has not been completed. The use of the turbidity curtain as a *Best Management Plan* (BMP) is one reason why this test is not needed.
- Weather Patterns. Storm frequency or intensity, wind, precipitation, ambient temperature for the area is unknown and undocumented.
- Bottom Depth Profile. Available depth management tools are incapable of accurately measuring depths of less than 6ft. IPOP surveyed the Bonanza Channel with sonar, finding the channel was too shallow (<6ft) for this method to work. IPOP also took physical depth measurements by boat and from core drilling and supplemented this data with 4K video footage (that accurately identifies the very shallow areas where sonar will not work). Thus the topography used in this application is reasonably, but not precisely approximate, but not accurate.
- Bulking Factor. Many factors affect material bulking, and settling velocities, and consolidation of material, and settling/reduction of pore space with removal of water. Lab-based tests cannot realistically calculate the ultimate bulking factor of the material of the dredged material from Bonanza Channel. Bulking factors vary depending upon material size fractions and percentages thereof (*i.e.*, clay, silt, sand), salinity of the water, depth of burial, pore space, density, machinery being used to dredge out the material, and how the material is deposited (on land, submerged, submerged with a current removing the clay in a turbidity plume), etc.. The bulking factor assumptions in the application are based upon the best references and engineering experience available.
- Eelgrass. IPOP conducted a drone-supported photographic eelgrass survey and coupled that with ground-truth surveys with an underwater camera towed behind a boat to prove that no eelgrass is growing within the claims DKSN 29-39. Though Applicant contends that there is no eelgrass in the years 1-5 mining area, the data may be incomplete locally. As part of the project's standard operating protocols, the areas planned for seasonal mining will be surveyed and sampled on a 50 ft grid before mining, and any eelgrass beds discovered will be avoided by Applicant.
- Fish Studies. Studies of fish have never been conducted in the general project area; therefore, the presence or absence of salmon, smolt or other fish species is unknown. Dredging operations

during the first five years will not take place on any known fish migration pathways; therefore, the presence of migratory fish in the project is expected to be minimal.

- Subsistence/Recreational Data. There is no official record of use of the area by subsistence or recreational users of the general project area.
- Tourists. There is no official record of the number of tourists that visit the general project area.
- Endangered or Threatened Species. There is no official record confirming the presence of endangered or threatened species in the general project area. Sightings of listed bird, seal and polar bear species are extremely rare. IPOP is committed to conducting around-the-clock wildlife monitoring for these or other species use the general project area.

3.0 LAND OWNERSHIP, MANAGEMENT AND USE

This section discusses the status of the lands that includes and surrounds the entire project area. A general land ownership map is included as Figure 3-1. A more detailed land ownership map is included as Exhibit 2.

3.1 Land Ownership

For the purposes of this Narrative, the term "general project area" includes the 32 State of Alaska mining claims owned by Applicant and identified herein, exclusive of all valid existing rights; section 6 of Township 11 South, Range 28 West, the surface of which is owned by Solomon Native Village Corporation and the subsurface of which is owned by Bering Straits Native Corporation; US Surveys 10249 and 10251, the Erwin Tucker Native allotment; all adjacent public lands, rights-of-way and waters owned by the State of Alaska within Township 11 South, Ranges 28, 29 and 30 West; and all adjacent public lands under the jurisdiction of the U.S. Fish and Wildlife Service.

The land ownership in the general project area is divided among three categories of entities: The State of Alaska, Bering Straits and Solomon Village Native Corporations and the owners of Alaska Natives allotments as is shown on the map in Plate 1.

The subject 32 State of Alaska Mining claims are all located within the Kateel River Meridian in the State of Alaska. These claims are all within Township 11 South.

The following claims are within Range 28 West:

Claim Name	ADL Number	Date Located	Rec. Doc. No.	Section	¼ or ¼ ¼ section
DKSN 15	ADL726979	12/28/2017	2018-000030-0	6	SW
DKSN 16	ADL726980	12/28/2017	2018-000031-0	6	SE
DKSN 17	ADL724968	8/3/2017	2017-000079-0	5	SW
DKSN 18	ADL724969	8/3/2017	2017-000069-0	5	NESW
DKSN 21	ADL724970	8/6/2017	2017-000070-0	5	SWNE
DKSN 22	ADL 724971	8/6/2017	2017-000794-0	5	SENE
DKSN 23	ADL 724972	8/3/2017	2017-000795-0	4	SWNW
DKSN 26	ADL 724973	8/6/2017	2017-000796-0	4	NENE

The following claims are within Range 29 West:

Claim Name	ADL Number	Date Located	Rec. Doc. No.	Section	¼ or ¼ ¼ section
DKSN 01	ADL 724966	8/3/2017	2017-000789-0	16	NW

DKSN 02	ADL 724967	8/3/2017	2017-000790-0	16	NE
DKSN 03	ADL 726975	12/28/2017	2018-000026-0	15	NW
DKSN 04	ADL 726976	12/28/2017	2018-000027-0	15	NENW
DKSN 05	ADL 726977	12/28/2017	2018-000028-0	10	SW
DKSN 06	ADL 726978	12/28/2017	2018-000029-0	10	SE
DKSN 35	ADL 726989	12/29/2017	2018-000040-0	19	SW
DKSN 36	ADL 726990	12/29/2017	2018-000041-0	19	NW
DKSN 37	ADL 726991	12/29/2017	2018-000042-0	19	NE
DKSN 38	ADL 726992	12/29/2017	2018-000043-0	20	NW
DKSN 39	ADL 726993	12/29/2017	2018-000044-0	21	SE
DKSN 40	ADL 726994	12/29/2017	2018-000045-0	17	SW
DKSN 41	ADL 726995	12/29/2017	2018-000046-0	17	SE
DKSN 42	ADL 726996	12/29/2017	2018-000047-0	17	NW
DKSN 43	ADL 726997	12/29/2017	2018-000048-0	17	SWNE
DKSN 44	ADL 726998	12/29/2017	2018-000049-0	17	SENE

The following claims are within Range 30 West:

Claim Name	**ADL Number**	**Date Located**	**Rec. Doc. No.**	**Section**	**¼ or ¼ ¼ section**
DKSN 27	ADL 726981	12/29/2017	2018-000032-0	26	NWSE
DKSN 28	ADL 726982	12/30/2017	2018-000033-0	26	NESE
DKSN 29	ADL 726983	12/29/2017	2018-000034-0	26	NE
DKSN 30	ADL 726984	12/29/2017	2018-000035-0	25	NW
DKSN 31	ADL 726985	12/29/2017	2018-000036-0	24	SW
DKSN 32	ADL 726986	12/29/2017	2018-000037-0	24	SE
DKSN 33	ADL 726987	12/29/2017	2018-000038-0	24	SWNE

DKSN 34	ADL 726988	12/29/2017	2018-000039-0	24	SENE

Each claim was located using state-of the art global positioning technology and with scrupulous attention to private property boundaries and lands controlled by the U.S. Fish & Wildlife Service. None of the claims overlay or subsume any private property or Alaska Native Allotments. The claims are all located on Bonanza Channel on the Seward Peninsula and are isolated from Norton Sound by a barrier island. The claims are all on land that is and at all relevant times was open to mineral entry under the Alaska Land Act, A.S. 38.05.190 *et seq.*

3.2 Legal Access

The Nome-Council Highway transects the Bonanza Channel barrier island. The following claims are adjacent to and contiguous with the Nome-Council Highway right- of-way:

1. DKSN 02, ADL 724967;
2. DKSN 35, ADL 726989;
3. DKSN 38, ADL 726992; and
4. DKSN 41, ADL 726995.

The contiguous claims can be accessed directly from the Nome-Council Highway as well as by State rights-of-way at the Safety Sound bridge or the Solomon River bridge. The claims can be accessed by wheeled or tracked vehicles and snowmobiles. During periods of open water, the claims can be accessed by small vessels and barges.

3.3 Land Management

3.3.1 Bering Straits and Solomon Native Corporations

Title to the surface of Kateel River Meridian Township 11 South, Range 28 West, section 6, was patented to Solomon Native Corporation pursuant the Alaska Native Claims Settlement Act as Patent Number 50-2004-0449 on September 24, 2004. A copy of this patent was recorded in the records of the District Recorder for the Cape Nome Recording District on July 3, 2006, as Document No. 2006-001001-0.

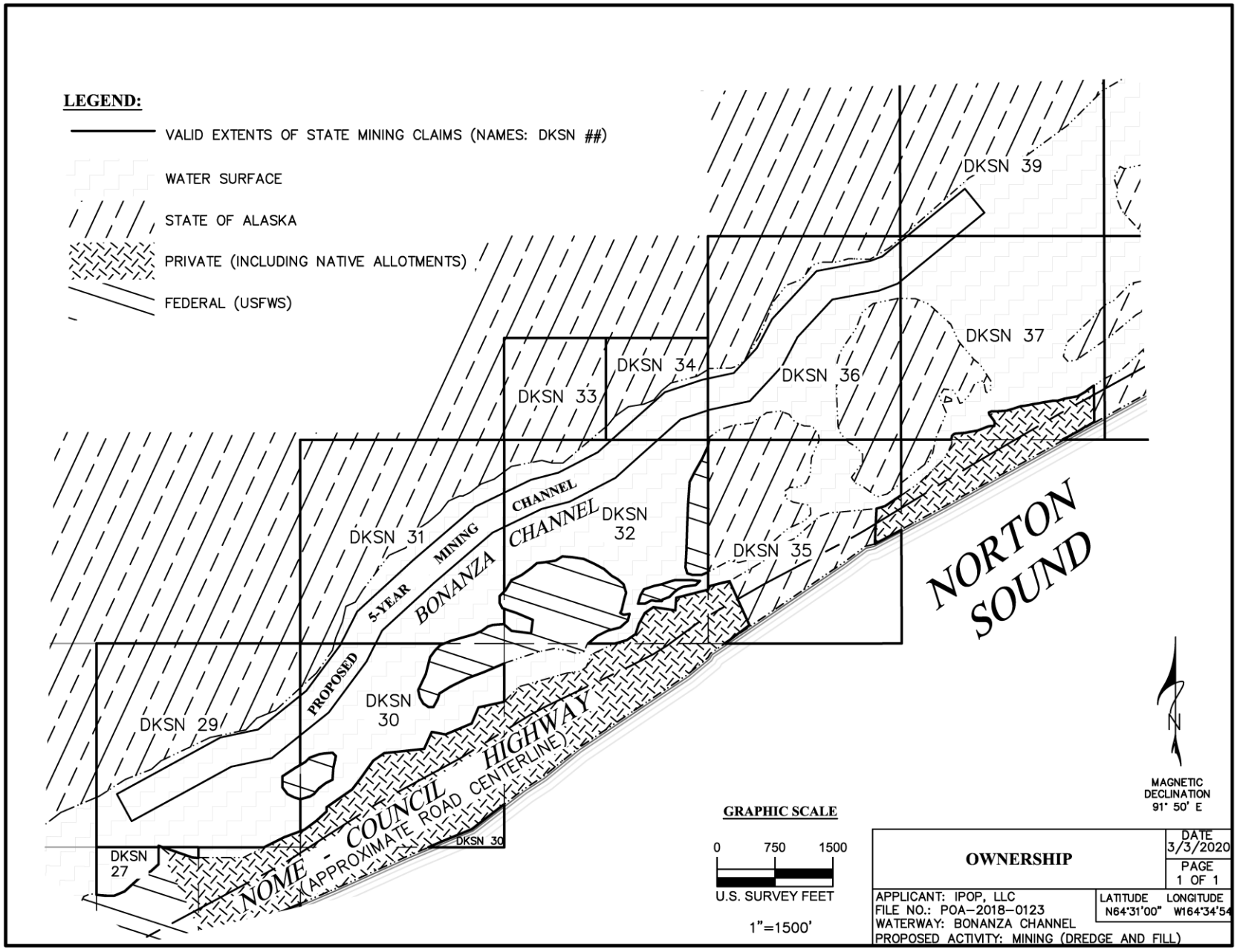
Title to the subsurface estate of Kateel River Meridian Township 11 South, Range 28 West, section 6, was patented to Bering Straits Native Corporation pursuant the Alaska Native Claims Settlement Act as Patent Number 50-2004-0450 on September 24, 2004. A copy of this patent was recorded in the records of the District Recorder for the Cape Nome Recording District on February 14, 2002, as Document No. 2005-000292-0.

DKSN 15 and DKSN 16 (ADL 726979 and 726980) are located within this section, below the high-water line, on tidelands owned by the State of Alaska pursuant to the Alaska Statehood Act. No trespass was committed when locating these claims, and no monuments were located on lands owned by Solomon Native Village Corporation or Bering Straits Native Corporation.

3.3.2 State of Alaska

Title to Kateel River Meridian Township 11 South, Range 28 West, sections 4 and 5 and was patented to the State of Alaska pursuant to the Alaska Statehood Act as Patent Number 50-2007-0278 on March 5,

Figure 3-1. General land ownership surrounding the IPA (graphic scale accurate, verbal scale refers to printed map)



2007. A copy of this patent was recorded in the records of the District Recorder for the Cape Nome Recording District on July 3, 2006, as Document No. 2007-000914.

Title to Kateel River Meridian Township 11 South, Range 29 West, was patented to the State of Alaska pursuant to the Alaska Statehood Act as Patent Number 50-2008-0477 on September 9, 2008, a copy of which patent is recorded in the records of the District Recorder for the Cape Nome Recording District on September 15, 2008 as Document No. 2008-001503-0.

Title to Kateel River Meridian Township 11 South, Range 30 West, was patented to the State of Alaska pursuant the Alaska Statehood Act as Patent number 50-98-0397 on June 30, 1998, a copy of which patent is recorded in the records of the District Recorder for the Cape Nome Recording District on July 29, 1998, in Book 350 at pages 220-221, as Document No. 1998-000881-0.

3.3.3 Bureau of Land Management

No lands owned or controlled by the United States Department of the Interior, Bureau of Land Management, are within or adjacent to the general project area.

3.3.4 Fish and Wildlife Service

Lands managed by the Fish and Wildlife Service are adjacent to the general project area. The subject placer mining project does not involve any upland mining and will not encroach on Fish and Wildlife Service Managed lands.

3.3.5 Native Allotments

There are 11 Native Allotments adjacent to the project area:

USS 10249, Lot 2	Heirs of Ester James	1993-000784-0
USS 10249, Lot 3	Myrtle Ann Komakhuk	1991-001666-0
USS 10251, Lot 1	Heirs of Shirley Nickalaskey	2013-000452-0
USS 10251, Lot 2	Heirs of Margaret L. Trigg	1992-000818-0
USS 10251, Lot 3	Heirs of Jerome Trigg, Sr.	2013-000451-0
USS 10251, Lot 4	Heirs of Darlene Barbara Trigg	1993-000423-0
USS 10251, Lot 5	Heirs of Carl Takak	1995-000358-0
USS 10251, Lot 6	Heirs of Minnie Fagerstrom	1991-001248-0
Garfield Subdivision, Lot 1A	Myrtle Ann Komakhuk	2015-000417-0
Garfield Subdivision, Lot 1B	Pete Larson, Jr.	1995-000500-0

Tucker Subdivision, Lots 1 -10	Erwin Tucker	2018-000380-0

None of Applicant's claims encroach on any Alaska Native Allotment.

3.3.6 Local Management

The project area is in the unincorporated borough of Nome Alaska and is managed by the Alaska State legislature. There are no site-specific statutes or regulations that impact the general project area.

3.4 Land Use

3.4.1 Subsistence

There are reports that the project area is used by members of the Nome Community for subsistence fishing, egg gathering, berry picking and migratory waterfowl hunting.

3.4.2 Recreation

The primary recreational activity in the project area is the Iditarod Dogsled Race which takes place each year in March. There are some reports that the general project area is occasionally used for casual recreation.

3.4.3 Tourism

There are anecdotal reports that visitors travel to Nome to observe seasonal migratory waterfowl migrations. The Nome visitor industry reports that such visits generate substantial revenue from such visits. It is anticipated that mining will not impact tourism during bird migrations or during any other timeframe.

4.0 ALTERNATIVES ANALYSIS

Applicant has explored and evaluated all reasonable and practicable alternatives for the proposed project that could potentially fulfill the project purpose and need while minimizing the environmental impacts of the operation. This section describes the alternatives considered and IPOP's proposed alternative.

4.1 Alternatives Consideration

The process for developing the alternatives for consideration by Applicant involved:

- Research as to the availability of placer ground that would meet Applicant's objectives; the project's purpose and need.
- Public outreach including public meetings and consulting with various stakeholders in the community.
- Consultation with the local Tribes and Regional Native Corporations (which is an on-going process that will continue).
- Hiring consultants and advisors to suggest and develop alternatives for consideration for all components of the project.

The team considered alternatives relating to the following aspects of the project:

1) Project location and layout including access and transportation.
2) Mining method and production rate
3) Processing equipment, location and gold recovery
4) Mining layout and dredge material disposal sites
5) Dredge area access
6) Camp impacts, location and power
7) Environmental considerations including air quality, turbidity, fish and wildlife impacts and reclamation
8) Social mitigation related to subsistence, recreational use and tourism

4.2 Alternatives Screening

Alternatives were screened by Applicant on the basis of the following criteria:

- Must meet the project's stated purpose and need.
- Must be reasonable and practicable; meaning that the alternatives must be economical, technologically achievable and logistically reasonable.
- Must be alternatives that would reduce adverse environmental impacts, or would add an environmental benefit.

Exhibit 4 summarizes the alternatives considered for the proposed project, the results of the screening, and the conclusion of each option.

4.3 Detailed Analysis of Applicants Proposed Alternative

Based upon the alternative analysis conducted by Applicant, the BCMP, as proposed, best fits within the screening criteria used by both the USACE and Applicant as described in section 4.2.

Details of the proposed project are discussed in the following sections.

4.4 Project Location

Applicant chose the Bonanza Channel and Tidal Lagoon locations for its proposed project based upon the following:

1) The Seward Peninsula is one of the most productive placer gold districts in the State of Alaska.
2) IPOP focused its search for mining properties that would permit use of efficient state-of-the-art floating cutterhead dredge technology in shallow, calm water.
3) Of the two proximate historic placer mining areas, the Solomon area has seen less placer mining than the Nome Mining area, making the general project area more prospective for the discovery of au un-mined placer deposits.
4) The Bonanza Channel is located down-stream of a highly productive stream placer (lower Solomon River) and a high-grade lode gold source (Big Hurrah).
5) The Bonanza Channel has not seen any reported placer production.
6) The Bonanza Channel may be on the edge of a paleo beach strand line, implying a theoretical trap for placer gold.
7) The ground was selected by the State of Alaska for its mineral potential; as such it was the most economical-open for mineral entry alternative in the Nome District.

No other project location met the project's needs. All alternative locations were either too expensive to purchase or had been mined out. No other locations met Applicant's requirement for shallow calm waters.

Applicant's proposed project is water dependent, thus the chosen location is key to the stated purpose for the BCPP: "*To economically produce gold from IPOP's mining claims on the Bonanza Channel and Tidal Lagoon using proven technologies that are specifically designed for shallow water estuary dredging and ultra-fine gold recovery."*

4.5 Access and Transportation

Access to mining projects has a direct impact on the economics of an operation as does the transportation for freighting of equipment, materials and supplies to service the mining operation, especially in remote Alaska. Nome has a well-established all-weather airport with regularly scheduled air cargo and commercial flights from Anchorage and a deep-water port with seasonal barge service for fuel and equipment. The Bonanza Channel area a prime location for a placer gold operation because it is located immediately adjacent to the Nome-Council Highway obviating the need to pioneer a new road to the general project area.

4.6 Mining Method

Applicant has developed a custom dredge specifically designed to operate in shallow inland waterways, consistent with the experience of Applicant's principals. The mining method and the availability of shallow, prospective lagoon was central to the concept, planning and economics of the envisioned project. The economics of operating within a shallow lagoon required a very efficient dredge with a high production rate. Although there are many kinds of dredges, a cutterhead dredge was the most efficient and practicable style of dredge for the operation for the following reasons:

1) Large gravels and boulders that would not hinder the performance of a cutterhead dredge are rare in this geological setting.
2) The sand/silt sedimentary estuarine column is often thick in this geological setting, and a cutterhead dredge is the most efficient method for dredging such materials.
3) A cutterhead dredge is smaller, and thus able to float on a well-designed pontoon system in very shallow waters, and better than a large trailing suction dredge to navigate a narrow inland waterway.

4.7 Material Processing

Applicant has elected to use the cutterhead dredge recovery system because it provides the most environmentally sound method for placer gold mining. Applicant determined the most reasonable option was to employ an on-site trailing processing barge that uses only gravity for the recovery for gold. The environmental benefits to this alternative are:

1) This method allows processing of the sands and the immediate re-deposition of the sands to the bottom of the estuary from which they were removed.
2) This method uses no chemicals in its gold extraction and is not harmful to the environment.

4.8 Mining Layout

The mining layout for Applicant's proposed project is based on locating the mining area in a single continuous "mining channel" located where Applicant had previously conducted exploratory drilling that indicated the presence of economic gold concentrations. The mining channel is designed to be a single continuous path. This allows the layout to combine all dredge material disposal sites (DMDS) into a single area between the mining area and the north shore of Bonanza Channel. This layout allows dredging to advance systematically through the gold-enriched sands to a prescribed depth, resulting in a predictable plan, with predictable results, thereby minimizing the environmental impact of the mining operation. Applicant's mining layout also creates new shallows in the DMDS for possible shorebird, seabird and water bird habitat.

4.9 Dredge Area Access

Access to the dredging area of Applicant's proposed project (Years 1-5) is through State of Alaska Claim DKSN 35, avoiding all private property. An access channel approximately 3,800ft-long will be dredged and maintained to accommodate the dredge and service vessels. This location is preferred because it was the shortest path to the mining area from State owned land; and because it is the option with the least environmental impact. The DMDS are contained between the uplands

and the access channel, providing an environmental benefit of added shallows and possibly mudflats during low water. The dredge access channel will not impede, but rather improve navigability through this area of Bonanza Channel.

4.10 Camp Considerations and Power

Applicant will place a small man camp on State Claim DKSN 35, immediately off of the Nome-Council Highway. The camp will be self-contained as described in Section 5.2. This camp option is the preferred alternative because of cost and liability reasons. The camp will house workers thereby eliminating the need for crew vehicles to travel the gravel highway twice daily. Applicant considers this less impactful to birds and other wildlife, and reduces the overall carbon footprint of the operation.

4.11 Environmental Impacts and Benefits

Applicant believes that its operation will have no significant adverse environmental impact on the Bonanza Channel or the Tidal Lagoon. The negligible water current and tidal exchanges will allow the BMPs proposed for the project (specifically a bottom-mounted turbidity curtain) to protect the inland waters from the negative effects of turbidity. This, coupled with the lack of salmon habitat in this shallow lagoon makes this an ideal place to mine for placer gold.

Possible benefits to the project include:

1) The deposition of dredged sediment into the near-shore shallows of the estuary in DMDS will potentially provide potential habitat for shorebirds, seabirds and water birds.
2) The project will leave the main part of the channel deeper, providing a deeper-water environment for the support productive eelgrass beds.
3) Applicant will routinely collect a wide array of environmental data during the mining and will provide the regulatory agencies with the information to improve future management of the inland waters of Alaska.

4.11.1 Visual Impacts

The project is designed to limit both the long-term and short-term visual impacts.

1) The camp is 100% modular and is constructed of quality materials that will not blow away in a storm, and will be properly maintained during the life of the project.
2) The dredge disposal sites are designed to at or BMLLW and to not look like typical dredge spoil piles.
3) The access channel and the mining area will be below water, and pose no visual impact.
4) The mining operation will consist of a minimum amount of small equipment surrounded by a floating barrier and will occupy a small footprint.

4.11.2 Air Quality

The operation uses highly efficient Tier III engines, with state-of-the-art emission controls. The operation will have a smaller carbon footprint than a typical land-based placer mine because it will not be using heavy equipment to excavate, haul and load material in a screen plant. The operation will not produce any fugitive dust.

4.11.3 Noise

Noise from the operation will be continuous sounds from the dredging and processing operation, with intermittent sounds from the push boat outboard engines (that will be operated at slightly more than an idle and never at full throttle). Most of the underwater sounds from cutterhead dredging is associated with the engines, generators and pumps with additional sounds from the rotation of the cutterhead in the substrate and movement of material through the pipeline (Reine & Dickerson, 2014).

Applicant's machinery is designed to emit in-air sounds below 80 decibels (engines and onboard pump sounds). Underwater sound levels are reduced in the proposed operation by eliminating large pumps to pipe tailings long distances; instead the operation deposits tailings directly into the water off of the processing barge, and short distance pumping of tailings in some cases. Because the dredge will be churning soft sand and silt, underwater sounds emitted will be much less than similar dredges operating in harder substrate or materials with abundant gravel. This coupled with the reduced sound propagation due to the complex geomorphology of the Bonanza Channel (shallow depths, shoals, islands, barrier island and seagrass), the > 25 ft depth of the mining channel and the acoustic attenuation from the use of a turbidity curtain surrounding the entire dredging operations suggest that the noise impacts to fish and wildlife will be negligible.

4.11.4 Effects on Fish

The bottom-mounted turbidity curtain will completely contain the operation and its turbidity, thus limiting any potential negative effect on aquatic life and will provide a barrier that will keep fish from entering the mining area.

4.11.5 Eelgrass and Essential Fish Habitat

There is no eelgrass in the mining area. The vegetated shallows impacted by Applicant's proposed mining operation and access for years 1-5 on DKSN 29, 30, 31, 32, 33, 34, 35, 36, 37 and 39 are not considered to be essential fish habitat; therefore, the operation in this location will not be a detriment to any essential fish habitat.

4.11.6 Effects on Wildlife

The general project area is important habitat for many migratory bird species in spring, summer and fall. However, because there will be no heavy equipment, travel, or loading noises and no dust the operation will not affect the birds using this area. Likewise, because the operation is in the water it will not affect any nesting birds, or any land-based wildlife; nor will impact any seals or other such wildlife that may enter the general project area between freeze-up and break-up (outside of the annual mining activity window) to follow winter food sources.

4.11.7 Impacts on Subsistence

The project is very small, comprising 0.1% of the total inland waters and Applicant believes that subsistence and mining at this small scale can peacefully co-exist in the general project area.

4.12 Impacts to Tourism

The Nome tourism industry relies in part on visitors who come to the general project area for bird watching. There are designated bird watching sites near the Safety Sound Bridge and for 16.6 miles along the Nome-Council Highway with Norton Sound on one side and the Wildlife Refuge and wetlands on the other side. These bird observation areas will not be impacted by Applicant's operation. Additionally, the project is a very small operation (active dredge area less than 1,240 feet long), representing only a fraction (less than 1.5%) of the total length of road accessible bird viewing areas adjacent to the highway.

4.13 Avoidance, Minimization and Compensation Statement

The project design presented in this section includes numerous measures to avoid and minimize environmental and other impacts to the resources of the general project area through strict alternatives analysis (Exhibit 4). Applicant will work with USACE throughout the permitting and public review process to identify any other potential measures or alternatives that meet the project need, that are both reasonable and practicable, that create a benefit to the environment.

Because of the nature of this project, it is impossible to avoid impacting WOUS and aquatic habitat. If necessary, Applicant will work with the USACE to implement a compensatory mitigation plan that is appropriate for the final project as established in the *2008 Compensatory Mitigation for Losses of Aquatic Resources: Final Rule,* that provides mechanisms for compensatory mitigation for unavoidable impacts to WOUS.

5.0 PLAN OF OPERATIONS

This Plan of Operations for the BCPP covers a period of 5 years, starting June 2020 through June 2025. The BCPP is entirely on State of Alaska mining claims in waters over which the U.S. Army Corps of Engineers asserts jurisdiction.

5.1 General Operational Plans

Figure 5-1 shows the overview of the BCPP. The BCPP operation will dredge/mine the sands located at the base of the inland waterway using a high-capacity cutterhead dredge and recover gold with a self-contained gravity recovery processing platform that is connected to the dredge by a 300 ft. long floating pipe. The critical components of the BCPP operation include a 22-man camp and staging area on state land uplands, multi-year exploration/delineation drilling and a multi-year dredging operation (for the production of gold) in an inland estuarine waterway accessed by a dredged channel. The operation is seasonal, with the annual mining activity window June 1- November 1 (operation under ice-free conditions), and the annual drilling activity window January 1- May 31st (exploration and delineation drilling occurring over ice and snow). The following sections detail the components of this operation.

5.2 Base Camp Operations, Waste Disposal, Fuel and Staging

IPOP proposes to locate its camp and staging areas adjacent to the Nome-Council Highway (a "summer" seasonal state-maintained dirt and gravel road) on upland State mining claim DKSN38 (Figure 5-1) approximately bounded by the four points 513, 514, 515, and 516 on Plate 1: Western and Central Blocks with Ownership. Plate 1 also provides the precise latitude and longitude of these points. Temporary structures, facilities and staging areas will cover 1.2 acres of uplands after setup operations.

5.2.1 Camp and Waste Disposal

The approximate base camp location within the parcel of state land is shown in Figure 5-2.

The office and living quarters are all on wheels and will be transported to the site at the beginning of the annual mining activity window and elevated on 6” x 6” timber crib-sets above typical flood stage elevation. Cargo containers are set on 6” x 6” x10' timber crib-sets and will remain in place for the duration of the project. The camp structures will be removed at the end of the annual mining activity window to winter storage in Nome.

Temporary structures in approximately the configuration as shown in Figures 5-2 and 5-3 will be placed at the base camp.

Camping structures are RV trailer type quarters. RV trailers are supplied by their own diesel generators on board. Additionally, two diesel generator sets, MTU 4R0113 DS60, 55 kWe /60 Hz /Prime, will be located in the campsite. The units are shown in Figure 5-3 on the right as two red boxes and located and labeled on Figure 5-2. Emissions data provided by the manufacturer shows grams per hour of NOx + NMHC, CO and PM as 3.5, 0.97 and 0.32, respectively.

Figure 5-1. Bonanza Channel Placer Project overview map (graphic scale is accurate, verbal scale refers to full size printed map)

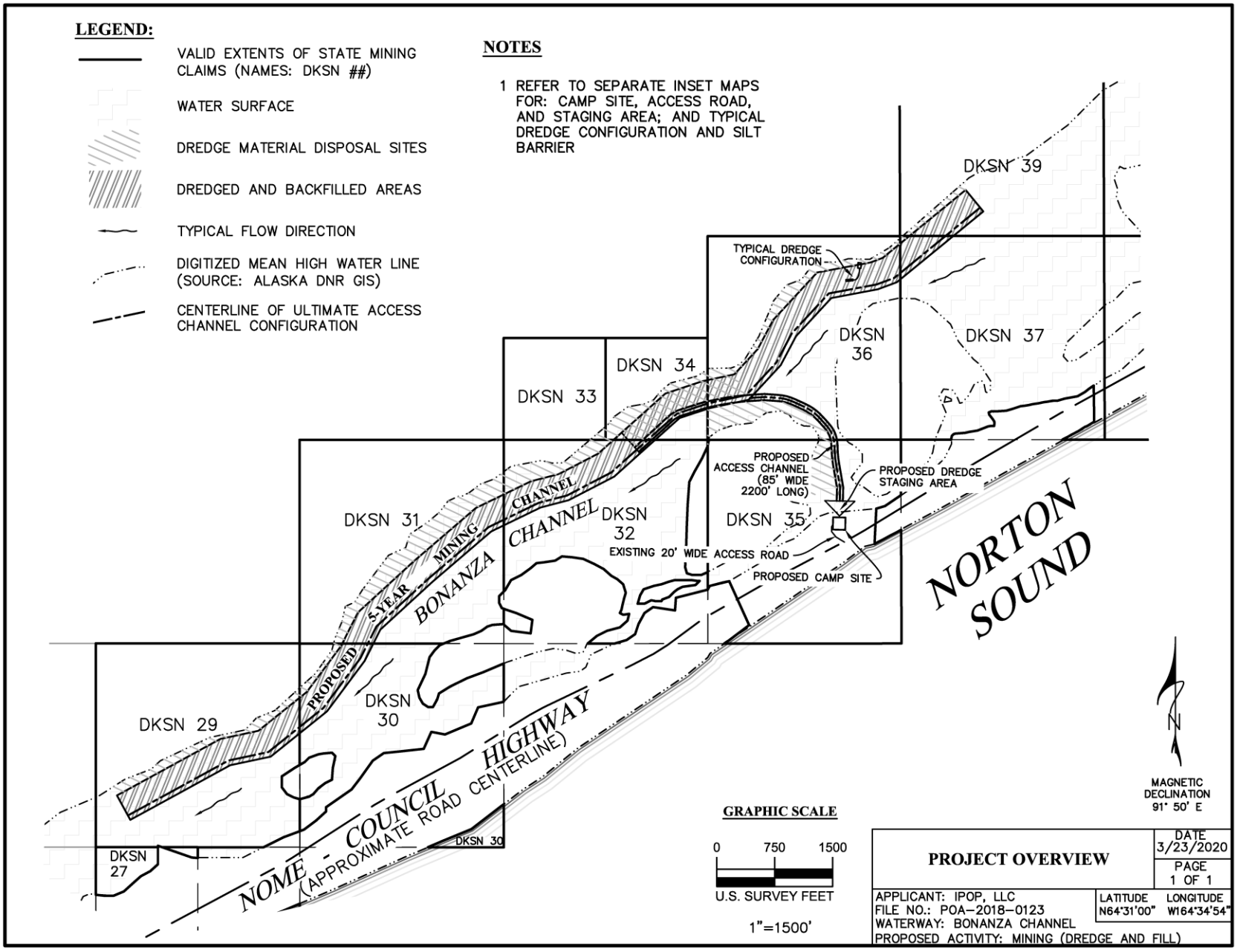


Figure 5-2. Camp Location (graphic scale is accurate, verbal scale refers to full size printed map)

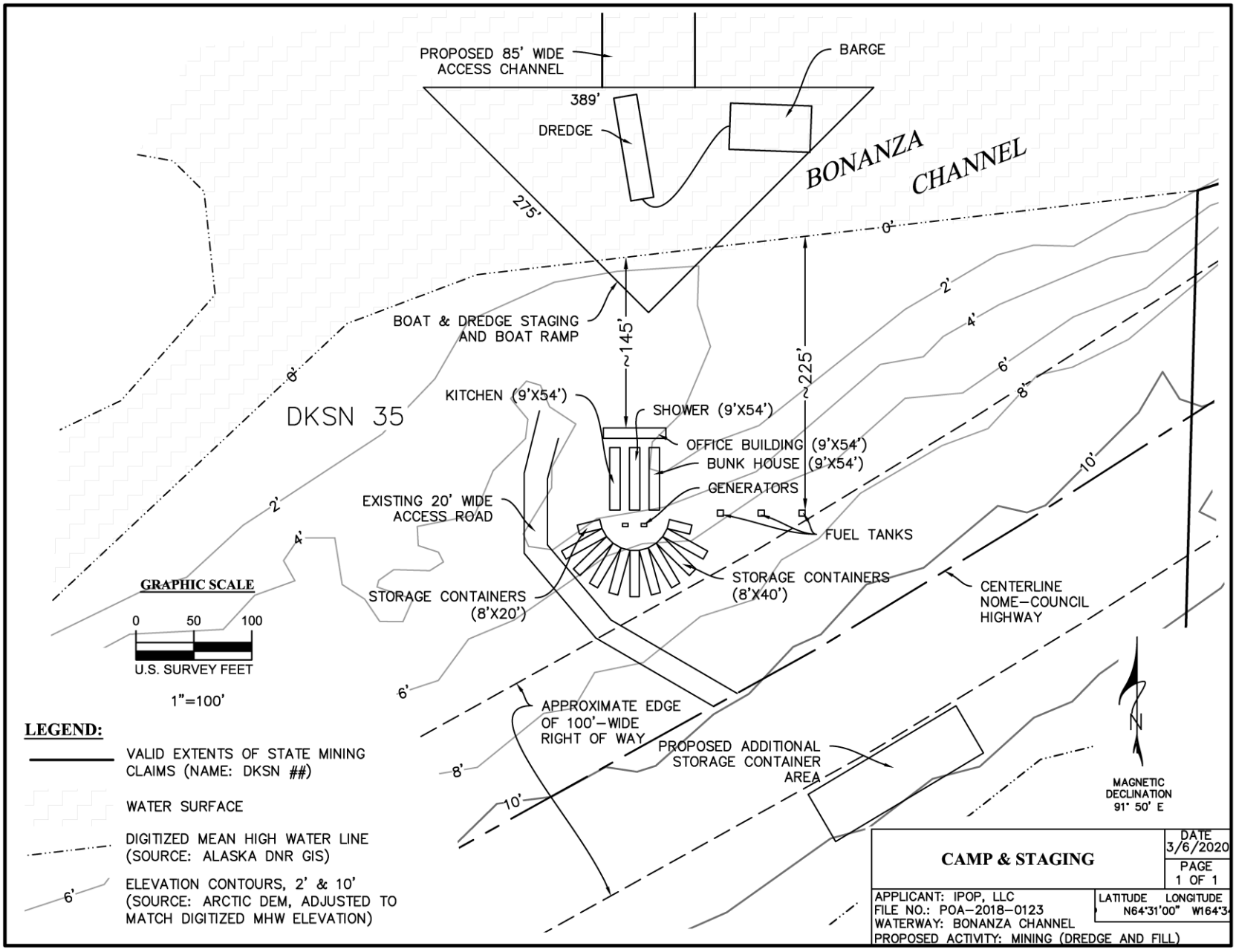
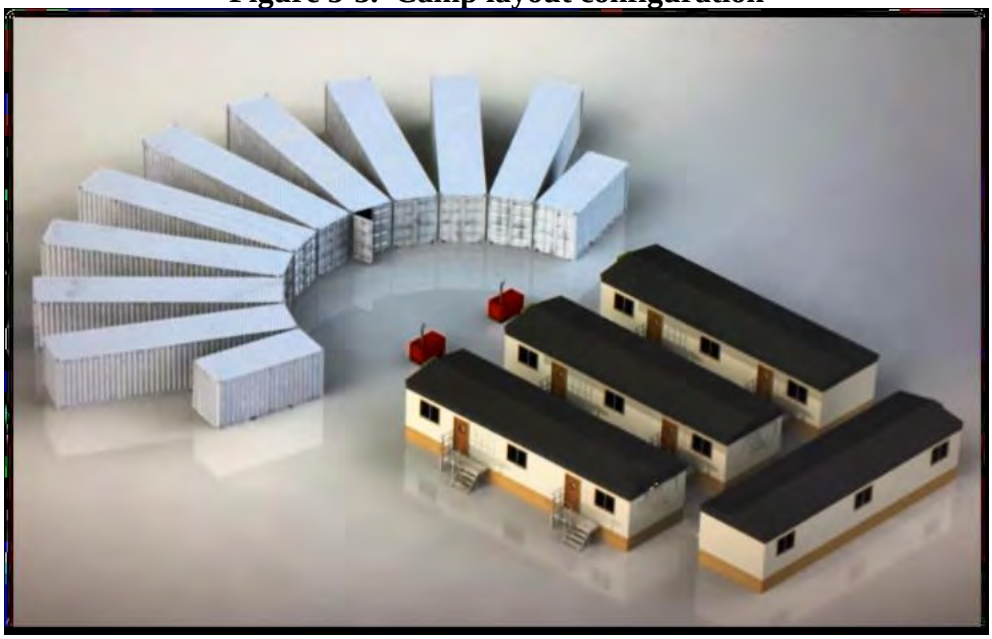


Figure 5-3. Camp layout configuration



An Atlas Model AT25263+APC desalination unit with a 2-inch intake pipe will be used to provide potable water, on demand, to the work camp at a rate of 3 gallons per minute.

No wastewater will be discharged. All toilet facilities have holding tanks. The tanks will be emptied by a Madden Sewer truck from Nome, AK.

5.2.2 Fuel Storage and Handling

Fuel deliveries to the camp shall be made by truck by either Bonanza or Crowley fuel distributors. Both gasoline and diesel shall be supplied, with the diesel fuel number one diesel which is low sulfur diesel approved by the EPA.

At the camp, two large fuel tanks will be stored on a 53 ft. trailer, which can be quickly removed if necessary with the Peterbilt tractor, allowing the fuel to be stored at all times 125 feet or more from the water's edge. Specifically, the trailer will hold a Western Global TransTank Pro P12 with a 3,124-gallon capacity to store the diesel fuel. A TransCube Global 30TCG 793-gallon double walled fuel tank will hold the gasoline. Both tanks have double walls and internal baffles to prevent fuel surge and provide safe handling and transportation. They are approved to transport fuel on road/rail/sea under UN, ADR, RID, IMDG, USDoT, UIC, and TIR regulations. Tank specifications for all fuel tanks are shown in Exhibit 5. Each tank is equipped with 150-foot special 300 PSI multipurpose arctic grade (-65 to +180 degrees) RMA Scoville hoses. Pump and tank fittings are housed in a lockable, vented cabinet. IPOP also will have fuel spill and oil spill emergency response kits on hand and a Spill Prevention, Control and Countermeasure Plan (SPCC) in place for the operation.

A TransCube Global 40TCG (1,240-gallon capacity) equipped with the same 150-foot special 300 PSI multipurpose arctic grade (-65 to +180 degrees) RMA Scoville hoses is installed on the larger of the two push boats for the operation (See section 5.3.3 for push boat details). When additional

fuel is required for operations, the hoses will simply be extended to the boat to fill up this tank. The push boat will dock with the processing barge and dredge platform as required, refueling those tanks; less than a fifteen-foot hose extension should be required to accomplish this.

The primary fuel consumption will be the generator on the processing barge (the unit has a built-in 350-gallon diesel tank) and the diesel engine powering the dredge (800-gallon diesel tank). At full, uninterrupted operational scale, each of these tanks can support approximately two days of operations, meaning that fuel deliveries will be required every other day or so. There is a smaller diesel hydraulic unit at the rear of the processing barge to raise and lower the spuds, with its own smaller tank, subject to intermittent use and infrequent filling.

The push boat itself has sufficient inbuilt gasoline tanks that, given the distances involved, it should require refueling with gasoline from the tank on the trailer only once a month or so. A smaller aluminum boat with a thirty-two-horsepower gasoline engine will be used to transport crew back and forth and minimize use of the larger vessels.

5.2.3 Equipment Staging

Both the suction dredge and the processing equipment, and the platforms they both sit on will be staged and assembled at the camp site using a Lima 900 110-ton crane. Both the dredge and the processing equipment sit on top of platforms built from multiple, 40 ft. by 10 ft. sectional barges create a substantial platform for the project's equipment, as illustrated in Figure 5-4.

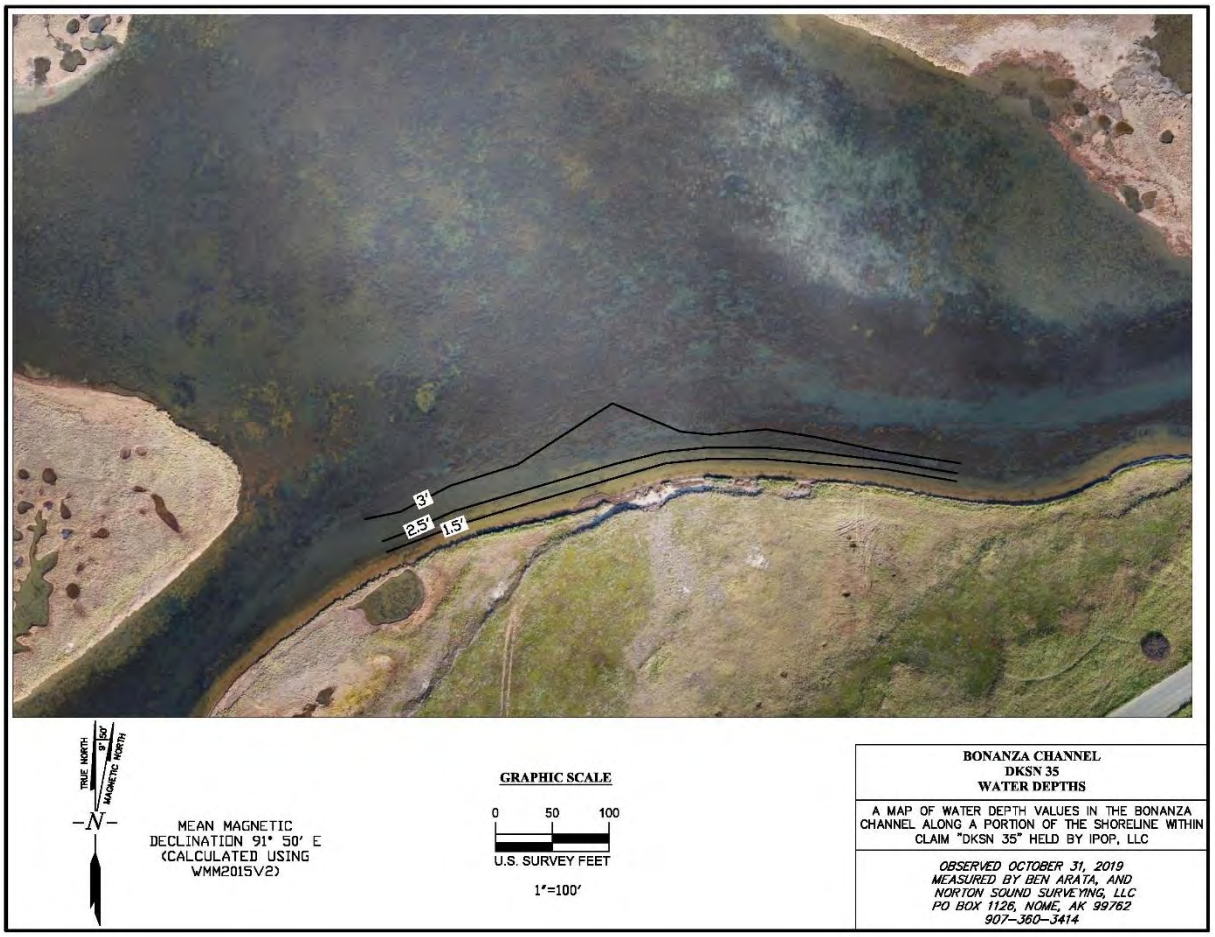
Figure 5-4. Sectional barge platform general layout

The sectional float plant manufacturing plant in Indiana will supply consulting and directing personnel to the target site for the assembly and buildup of the sectional floating barge.

IPOP's calculations suggest that the barges, fully loaded, will draw less than 2' 9" of water. IPOP has conducted depth measurements in the vicinity of the camp showing an area of water that will suffice to launch the barges from the shore by rolling them off the edge of the land into the water using marine air bags. Because a significant portion of the platforms will be over the water before the vessel tips off the airbags into the water (particularly when launching them light end), they should float immediately.

Figure 5-5 is from 4K drone footage conducted by IPOP showing the launching area for the dredge and processing platform.

Figure 5-5. Dredge and processing platform launch site (4K drone footage)



5.3 Details of Equipment

The inventory of equipment to be used includes a single-engine 10" dredge using a controllable 36" Vosta cutterhead on an innovative, high-technology barge described in detail below. (The cutterhead is a device that generates a vortex of current in the water to dislodge the layers of compacted clay, loose gravels and sands; no cemented aggregates will be present that would require "cutting".) The suction dredging barge will be connected by up to 300 ft. – 600 ft. of 10 in. pipe to a 40 ft. x 70 ft. processing barge, also described in detail below.

The suction dredging and processing barges are not self-propelled, other than to the extent that they can "walk" by controlling vertical ground anchors called "spuds," described below. The barges will also be moved by using two barge tenders or "push boats" depicted below.

5.3.1 Suction Dredge Barge Details

The suction dredging barge is based on technology commonly used by the U.S. Army Corps of Engineers to dredge rivers and harbors. It consists of two parts, shipped separately by tractor trailer and joined at the site into a single unit. Figure 5-6 is a picture of the front section on a trailer

Figure 5-6. Front section of dredge barge on a trailer

The rear of the front section holds host two large vertical "spuds" within the gray holders visible at the rear of the front section. The spuds which may be raised, lowered and angled (to provide a "walking" effect that can move the entire dredging barge).

A 35 foot "ladder" which is raised and lowered with cables emerges from the front side of the front section (the left-hand side of the above picture). The cutter head is at the end of this ladder, shown in this photograph of the ladder and head under construction (Figure 5-7).

The front section as shown in Figure 5-6 will be supplemented with pontoons on each side, giving it a total width of approximately 20 ft.. Figure 5-8 illustrates the assembled version of the front section (including the pontoons). This section is 50 ft. long by 20 ft. wide.

On the right side of Figure 5-8 one can see the two spuds; on the left, the ladder and cutting head (which also contains the 10 in. suction dredge pipe leading to the cutter head).

An "idler float" will be attached to the rear of the dredge when assembled. The idler float section is narrower, being 40 ft. long and 11 ft. wide. Figure 5-9 is a photograph showing the front

Figure 5-7. Cutterhead and ladder under construction

of the rear section (where it connects to the front section). The gray box on top of the barge is the power used to move the spuds.

When the front section and the idler float are connected on site, the resulting vessel will appear as illustrated in Figure 5-10.

The single spud at the rear of the idler float as shown in figure 5-10 serves as a pivot point for the entire 90 ft. barge. By anchoring the pivot point in the rear, the cutter head can work a precise pattern up to 200 ft. wide. A large arc can be cut back and forth to the appropriate depth, and then the front spuds are used to advance the dredge an incremental distance, and the dredge pivots from the new point to cut advancing arcs.

A Caterpillar ACERT C15 diesel engine is mounted on the suction dredging barge. It will power the cutterhead portion of the mining system and raise and lower the spud anchor system. The Caterpillar ACERT C15 engine emissions meet China Nonroad III Standards, U.S. EPA Tier 3 Equivalent Standards and EU Stage IIIA Equivalent Standards.

Figure 5-8. Schematic of assembled cutterhead dredge

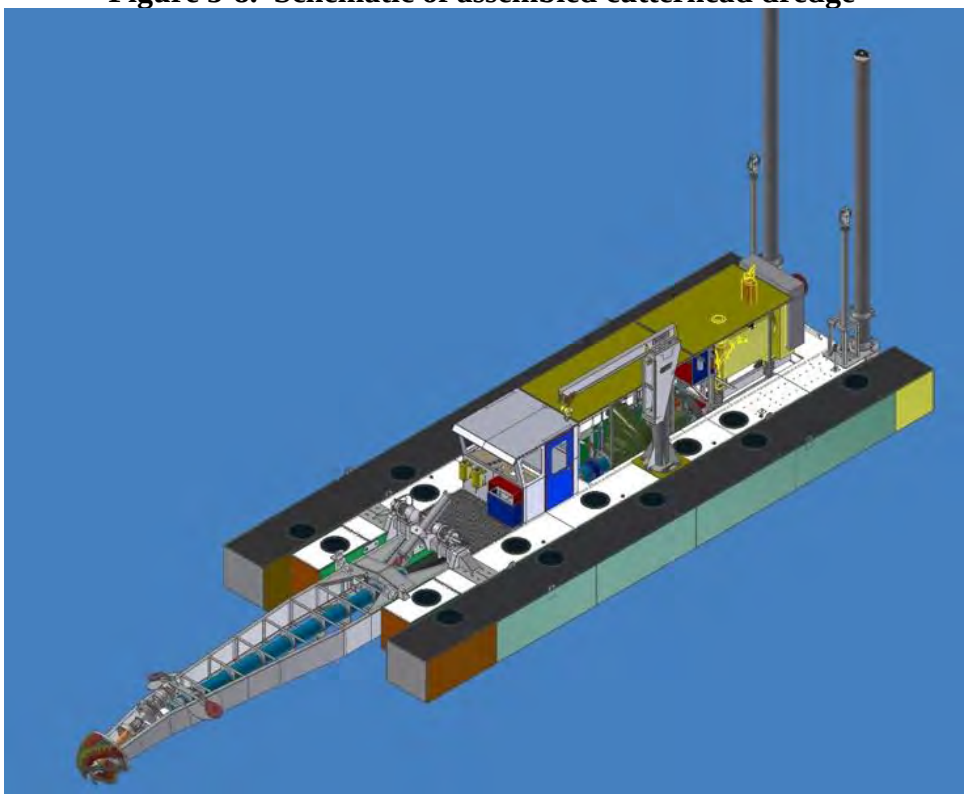


Figure 5-9. Idler float showing pin bushings where it attaches to the dredge

Figure 5-10. Complete assembled cutterhead dredge and idler float

The suction dredging barge, fully assembled, can excavate approximately 267 cubic yards per hour, based on an engineering analysis supplied by Pearce Pump Supply. Exhibit 6 is a copy of the System Curve and Pump Evaluation prepared by Pearce. The slurry volume being pumped to the processing barge from the dredge is anticipated to be between 20 to 30% solids based on reports from Bering Sea gold suction dredges. For purposes of the estimated production quantity, the Exhibit 5 analysis assumes 25% solids by weight.

A John Deere 173 hp engine will be installed on the suction dredging barge to operate a small auto crane mounted on the port side. This engine meets EPA Tier 3 standards. It will provide the power to raise and lower the spud anchor system.

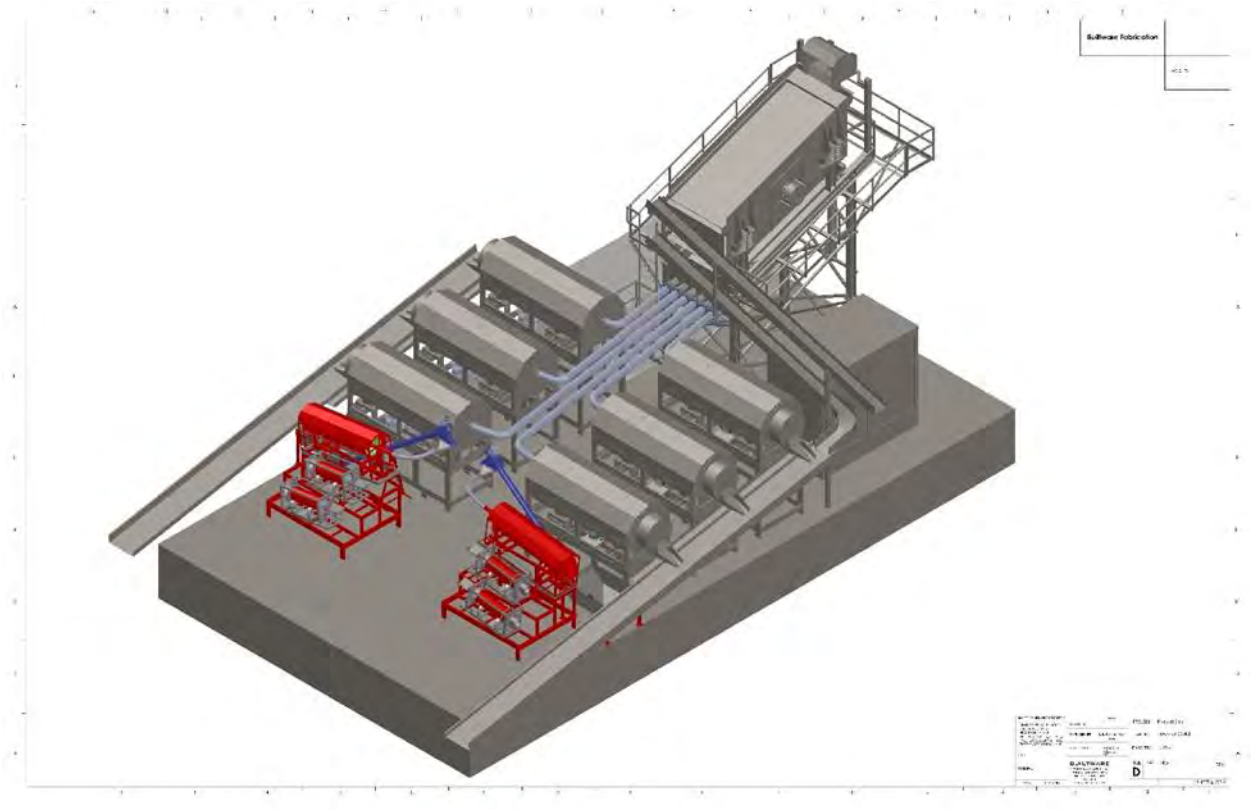
State-of-the-art Hypac© software for dredging control, in conjunction with GPS readings and computer control, the software will allow both excavating and re-depositing materials in a controlled and planned manner, maintaining a record of activities.

5.3.2 Processing Barge Details

The processing barge is a fully equipped, self-contained floating wash and gold recovery plant. The deck space is 40 ft. wide x 64 ft. long. The barge pontoons are made in eight separate sections that will be pinned and bolted together at the camp site as described below. A structural steel sub-deck is pinned and bolted onto the Pontoons. The sub-deck is a mounting platform for all the heavy equipment components. Figure 5-11 is a drawing of the processing portion of the barge (it does not show the two hydraulically controlled spuds on the barge which will be located near the secondary and finish concentration area).

The processing barge incorporates a 20 ft. x 8 ft. operator control room, complete electrical wiring and plumbing, an enclosed 225 kw diesel generator with fire suppression system, a small diesel hydraulic unit for raising and lowering the spuds, a crew disembarkation dock, safety hand railing's and work platforms, work and navigation lights, life vests and rings, radio communication, fog horn, fire extinguishers, first-aid kit and the listed processing equipment described below.

Figure 5-11. Processing components of the processing platform



A generalized processing flow diagram is shown in Exhibit 7. The following describes the process in more detail.

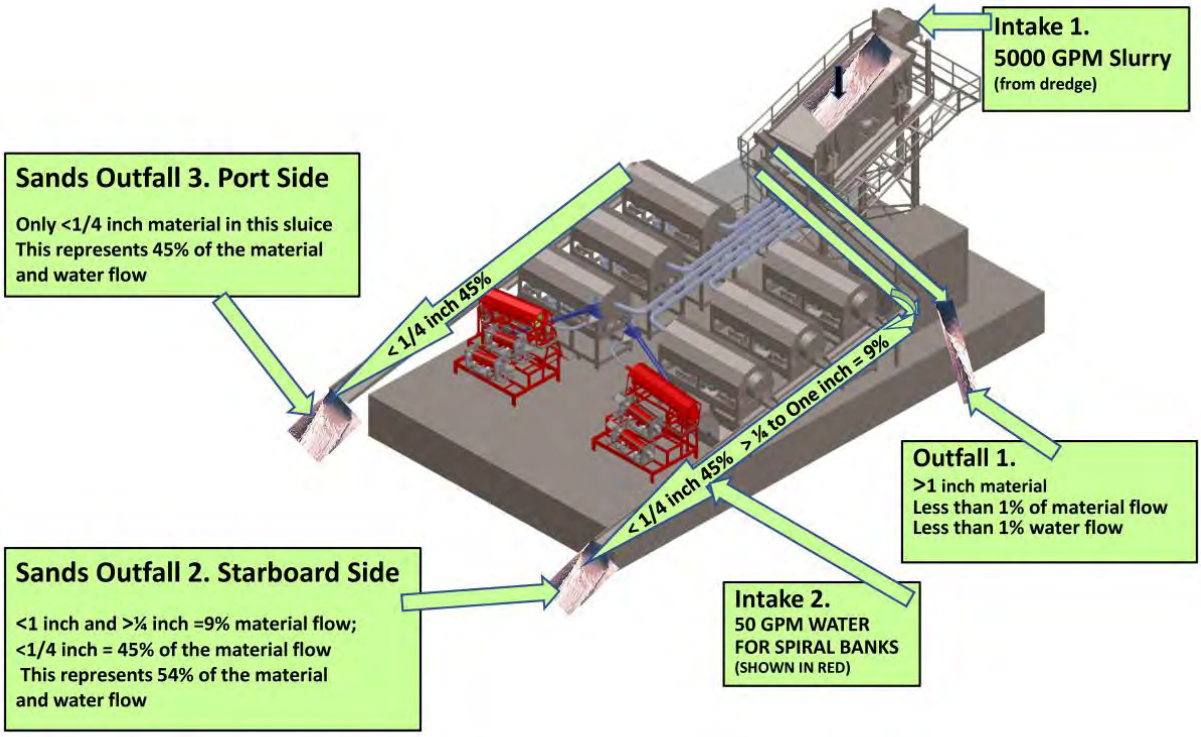
The processing barge is connected to the suction dredging barge, via a 10" internal diameter floating poly pipeline. The dredging operation will only suck up materials smaller than 4".

The 10" poly pipeline from the dredge connects to the processing barge's 10 in. slurry feed hose delivering natural sands and gravels from the bottom. The slurry hose feeds directly to a break box. The break box delivers the material downward to the screen deck shaker. The break box is located above the feed end of a vibrating screen deck classifier (*Intake 1*, Figure 5-12).

The slurry stream falls onto the vibrating screen deck classifier. There are two 7 ft. x 16 ft. screen deck sections, one above the other. The top screen deck is made of polyurethane, with a non-clogging 1 in. square hole pattern. The lower screen deck is made of polyurethane, with a non-clogging ¼ in. square hole pattern. Three products are made by the screen classifier, 1" to 4" Stone, 1 in. - 1/4 in. Gravel and -1/4 in. Sand.

The 1 in. – 4 in. material is expected to be less than 1% of the total solids volume. This product falls from the top deck of the screen onto a 24 in. discharge chute and directly off the starboard side of the barge directly back into the water (*Outfall 1,* Figure 5-12).

Figure 5-12. Processing barge intakes and outfalls



The 1" to ¼" material from the lower screen is diverted into a 24" chute connecting to the starboard side nugget sluice, which is labeled *Sands Outfall 2* in Figure 5-12. The 1" to ¼" gravel product will constitute approximately 9% of the total solids volume out of *Sands Outfall 2*.

The - ¼" sand product will constitute approximately 90% of the total solids. This product will pass (as a slurry) from the lower screen and fall into a catch trough. The catch trough will carry the slurry to the centrifuges.

There are six individual 42" low-G centrifuges being used as the primary gold concentrators. Each centrifuge has the production capability of 75 ton/hr. Five of the centrifuges will be in operation at any one time, while the sixth will be in "cleanup mode" allowing 24/7 operation without any production loss time for cleanup.

A low-G centrifuge is a batch type primary concentrator that holds the concentrate inside its concentrate chambers, until cleanup is made. To clean out the centrifuge, the RPM is stepped down allowing the concentrate to fall from the chambers and wash out flowing into the concentrate trough that flows by gravity into a concentrate auger bin.

The rejected discharge from the centrifuges is split into two equal halves, with three centrifuges feeding each half and discharging into port and starboard side nugget sluices. Each sluice is 4 ft x 40 ft.. This material is discharged equally from *Sands Outfall 2* and *Sands Outfall 3* (Figure 5-12).

There are two 6 in. x 18 ft. concentrate augers with holding bins. The concentrate augers feed the primary concentrate from the centrifuges to the secondary and finish concentration circuit.

The secondary and finish concentration circuit consists of two reverse multi-helix spiral banks. The spiral bank is made of a 24 in. x 8 ft. primary spiral cleaner, a 16 in. x 4 ft. secondary spiral cleaner and a 16 in. x 4 ft. spiral finisher. The 16 in. spiral finisher will produce a smelt grade product, ready for pouring into a gold bar. A negligible percentage of the discharge from *Sand Outfalls 2 and 3* will consist of rejected heavy mineral material from the concentrate. From the assay data from the core drilling (Exhibit 8C), the heavy mineral sands will consist of minerals containing arsenic, copper, lead, and trace amounts of mercury. Any heavy metals that are recovered along with gold will disposed of in accordance with applicable law.

A diesel generator set, MTU 8V1600 DS400, 365 kWe /60 Hz /Prime, 208 - 600V, will be located on board the processing platform. The emissions data provided by the manufacturer are as follows: NOx + NMHC, CO, PM are 5.01, 0.52, and 0.04, respectively. All units are in g/hp-hr and shown at 100% load (not comparable to EPA weighted cycle values). Emission levels of the engine may vary with ambient temperature, barometric pressure, humidity, fuel type and quality, installation parameters, and measuring instrumentation.

The processing barge also has an on-board lab equipped with a fume hood and a small smelting furnace for making gold doré.

5.3.3 Barge Tender/Push Boat Details

Figure 5-13 is a photograph of the two barge tenders that will be used for the operation. The two boats are powered by Suzuki DF350A outboard engines. The larger boat (approximately 25 ft x 11 ft) has two engines, and will carry fuel as described below, the smaller boat (approximately 20 ft. x 11 ft.) has one engine.

Figure 5-13. Barge tenders/push boats for the operation

5.4 Description of Dredged or Filled Soils

Applicant conducted core drilling in 2019 to characterize the soil from the mining area and to gather material for bench-scale metallurgical testing. This drilling consisted of 13 holes down to

a depth up to 31 ft. BMHW (below mean high water). Details for this drilling are included in Exhibit 8. Additional drilling is planned for 2020-2024.

5.4.1 Geochemistry

Applicant submitted 3 hand-dug samples from the area and drilling samples from 13 holes drilled in 2019 to American Assay Labs in Sparks, NV. Each hole was composited from top to bottom. A representative split was taken by the lab for each drill hole and analyzed for whole rock geochemistry using ICP (inductively coupled plasma) for 48 elements, XRF (X-Ray Fluorescence) Fusion and XRD (X-Ray Diffraction for various rock forming minerals. Analytical results for all these samples are shown in Exhibit 8 and are considered representative of the geochemistry of the IPA down to a depth of 31 ft/ BMHW (below mean high water).

No hazardous, toxic or radiological waste issues were indicated in the drilling samples. Chemical analysis of the drilling samples did not indicate any sort of human-caused chemical contamination.

The following elements of concern to water quality are discussed below. The potential for element leaching into the water is minimal because the elements are tied up in stable buried minerals in the sand that would need prolonged exposure and leaching to oxidize and release contamination. Because the minerals are not ground or crushed (as is done to liberate the elements for assaying) during the mining and gold recovery process, and because the concurrent reclamation results in rapid burial of the sediment (limiting exposure time) and only a very small percentage of the minerals will remain exposed on the bottom of the waterway at completion of the reclamation; therefore, it is extremely unlikely that these elements will leach into the waterbody.

Arsenic. Arsenic is commonly associated with gold ores from the Orogenic gold deposits found on the Seward Peninsula and its presence in the general project area is due only to local mineralogy. Big Hurrah lode deposit, 5.6 miles to the NE of the general project area, contains occurrences of arsenopyrite (AsS_2) suggesting a source for the arsenic in the project beach sands (Novagold Resources, 2007). On the basis of the concentration of arsenic in the sediment from these samples, concentrations are far less than metallic element arsenic regularly reported in samples from the Nome Harbor and the Snake River that have been reported as high as 200 mg/kg (181.44 ppm) (Northwest Aquatic Sciences, 1991; Woodward-Clyde, 1998; USACE, 2019). Arsenic concentrations in the 2019 drilling averaged 8.01 ppm, far less than the concentrations found in Nome and far less than the marine sediment screening level of 57 mg/kg (51.71 ppm) total arsenic currently used by the USACE Alaska District under the dredged material management guidelines (DMM) 2018.

Mercury. The samples that contained mercury on the claims were taken from the underwater sediment NW corner of mining claim DKSN31. A trace amount of mercury was detected in these samples (0.022 ppm). Samples from the Big Hurrah lode deposit 5.6 miles from the project site, shows an average mercury content of 0.065 ppm from 1,400 soil samples (Novagold Resources, 2007), indicating that the mercury present in the samples taken from the IPA are likely representative of naturally occurring, local mineralogy that has deposited in this area along with the gold in which it correlates.

Copper. Copper is a mineral found in some breccias at the Big Hurrah lode deposit in the hills to the NE of the IPA (grades in soil as high as 695 ppm) (Novagold Resources, 2007). Copper is present in concentrations from the drill holes averaging 16.83 ppm.

Lead. Lead in soil geochemistry from the nearby Big Hurrah lode deposit is fairly consistent, averaging 22.07 ppm in 1,400 soil samples (Novagold Resources, 2007). Chemical analysis from the drilling in the IPA shows an average lead content of 37.15 ppm. The higher-than-background lead concentration may be due to lead shot from waterfowl hunting.

5.4.2 Soil Size Fraction

The observations of 2019 drilling recorded the presence mostly sand with minor quartz cobbles and a recognizable clay layer that could be correlated with depth, hole-to-hole, across the area drilled. American Assay labs returned results for sieve analysis for the representative size fraction of material from the thirteen 2019 drill holes and reported the percentages for sand, silt and clay sized fractions. Though the drilling did hit a few boulders of quartz, these were not included in the size fraction analysis; material >1/4 inch is rare and represents less than 10% of the material that will be mined using the cutterhead dredge method.

The size fractions of all the holes are fairly consistent. The ratio of sand to silt and sand to clay is considered within the range of variability expected for tidal sedimentary sequences in high energy locations like the Bonanza Channel. Table 5-1 details the results of the sieve analysis.

Table 5-1. Results of 2019 drilling sieve analysis

Hole_ID	Sand %	Silt %	Clay %
BH-01	82.03	12.75	5.22
BH-02	94.58	3.05	2.37
BH-03	89.25	6.09	4.66
BH-04	77.7	16.55	5.75
BH-05	72.14	21.32	6.54
BH-06	83.75	11.42	4.82
BH-06 Dup	85.77	9.54	4.69
BH-07	83.26	11.13	5.61
BH-08	81.37	13.66	4.97
BH-09	80.42	14.46	5.11
BH-10	77.63	18.01	4.36
BH-11	82.24	14.12	3.64
BH-12	72.33	22.06	5.6
BH-12 Dup	74.59	17.7	7.71
BH-13	84.32	12.14	3.55
Averages	*81.62*	*13.12*	*4.94*

*Dup = duplicate analysis

5.4.3 Stability Assumptions

Soil stability evaluation is critical for determining the angles of repose for the trenches and working faces with respect to depth and for understanding the dynamics of backfill/reclamation or the slopes of the DMDS. The following are the most significant components affecting soil stability and shear stress in a dredging operation:

- Soil size fractions
- Water content
- Pore space (density)
- Depth of dredge channel
- Water depth

In-Situ Stability

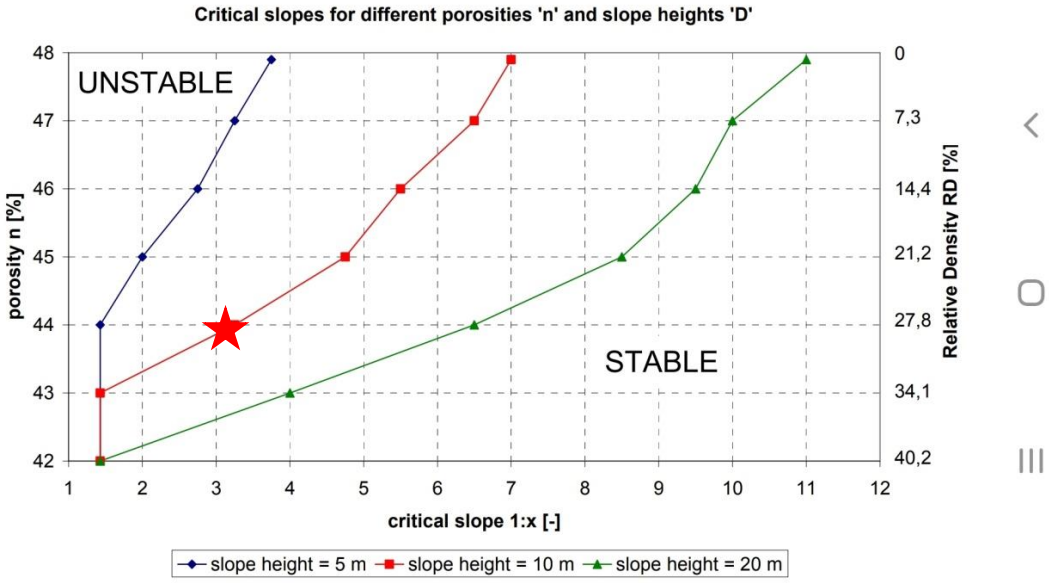
Size fractions are known from the test drill hole analysis and show that the material averages 81.6% sand, 13.12% Silt, and 4.94% clay. Normal facies changes in a beach stratigraphic sequence results in highly variable sand, silt and clay layers that can affect the in-situ stability of the soil. In general, sand is the most stable.

In most depositional settings porosity, or conversely density, changes with respect to depth. In nearly all cases the sediment becomes denser with depth. Water content is directly proportional to porosity; the sediments will contain less water with depth in the sedimentary column. The angle of internal friction is influenced by all these as shown by the chart in Figure 5-14. Shear failure is the most common instability mechanism for slopes (Raaijmakers, 2005). The project conducted no in-situ standard penetration tests (SPT), so the geotechnical properties of the soil could not be determined, thus Applicant has assumed well-drained soils with a relative density averaging 27.8%, based largely on the stratigraphy from the drilling. Based on this Applicant has assumed the worst-case scenario for this relative density and a maximum mining depth of thirty-one feet (represented on the 10m depth line in Figure 5-14 in all of its designs. The slopes of the cuts are assumed to be listric in section, ranging from 16° near the slope toe, and steepening toward the surface to nearly 20° with an overall slope of 18.4° or 3:1 (H:V).

Dredged Fill Stability

Water content will vary between in-situ sediment and dredged sediment, whereby hydraulic dredging disrupts the settled and compacted soils, mixes them with water and jettisons the slurry through the system. When these soils are discharged rocks and the coarser size fractions of sand settle to the bottom rapidly stacking up relatively steeply near the outfall. Silt is carried a bit further by the current created by the discharge and runs down the toe of the sand pile. Clay remains in suspension for a longer period of time, and flocculates depending upon various factors like water conductivity, current, and nature of the clay. As such, clay will precipitate over much larger areas and will not generally affect the stability of dredged fill at the immediate point of discharge. Because of these factors, the DMDS slopes are designed at a 3:5:1 horizontal to vertical slope under water. Fill slopes will be monitored during operations and designs will be adjusted if necessary.

Figure 5-14. Critical slopes for typical dredge channels depending on depth and porosity (*modified after* Raaijmakers, 2005). BCPP design slope indicated by red star.



5.4.4 Bulking Factor

During the dredging process a change in density is caused by the increase of void space that causes the dredged soil to expand. This is referred to as "bulking". The "bulking factor" is a multiplier describing the amount the soil expands once it is dredged and discharged (as opposed to "swell factor" which is normally represented in percentage). The bulking factor for soils is primarily dependent upon the following factors:

1) In-Situ soil density
2) Soil size fractions and percentages thereof
3) Depth of discharge/fill
4) Types of machinery used in the dredging operation
5) Water current
6) Rates of settling
7) Water conductivity

The rates of settling, or sedimentation behavior of hydraulically dredged soils can be explained by the settling characteristics typical of the depositional environment. Three types of settling can occur: Discrete settling, flocculant settling and zone settling. Discrete settling is where particles settle individually with a constant rate such as stones and coarse-grained heavy sands. Discrete settling results in less material bulking, but this is entirely dependent upon the grain size and morphology. Discrete settling is less common than the other two types of settling and would be less common in the case of the BCPP because the coarse material represents less than 10% of the anticipated mined material. In flocculant settling particles agglomerate to form flocs and settling rate increases with time resulting in added bulking of the soils (i.e., clays). In zone settling the particles agglomerate further and settle as a three-dimensional lattice and start to consolidate as

they settle because the single network of floc is in a state of compression from the beginning of the settling (Lin, 1983). The dredged material is expected to settle by a combination of all three of these types. The settling behavior of the material will affect its ultimate density (void space/porosity) as fill as does the self-weight consolidation, and subsequently the bulking factor of the soil due to hydraulic dredging.

Rather than conduct in-situ SPT tests to determine the geotechnical properties of the soil (to provide a basis for more rigorous and detailed bulking factor determination) Applicant has used various references and consultation with dredge soil engineering firms to determine the worst-case scenario for bulking of the dredged materials for the purposes of designing the layout of DMDS adjacent to the mining area that can accommodate the maximum bulking that could occur (worst case scenario).

The calculations for bulking are detailed in Table 5-2 using typical bulking factors as described in (Lacasse et.al, 1977 and Bray et. al., 1996). For this project Applicant is assuming an average bulking factor of 1.075 considering self-weight consolidation will occur on 7.5% of the material deposited and buried in the deepest part of the mining channel. The DMDS are discussed in Sections 5.8.1 and 5.9.2.

Table 5-2. Calculated bulking factor for the BCPP

Typical B.F.	Reference	Sand	Silt	Clay	*Average Bulking Factor by Drill Hole*	
	Bray et. al., 1996	1.15	1.25	1.1		
	Lecasse et. al., 1977	1.1	1.3	1.5		
	Drill Hole ID	**Sand**	**Silt**	**Clay**	B.F. Bray	B.F. Lecasse
2018 Core Holes	BH-01	82.03	12.75	5.22	1.16	1.15
	BH-02	94.58	3.05	2.37	1.15	1.12
	BH-03	89.25	6.09	4.66	1.15	1.13
	BH-04	77.7	16.55	5.75	1.16	1.16
	BH-05	72.14	21.32	6.54	1.17	1.17
	BH-06	83.75	11.42	4.82	1.16	1.14
	BH-06 Dup	85.77	9.54	4.69	1.16	1.14
	BH-07	83.26	11.13	5.61	1.16	1.14
	BH-08	81.37	13.66	4.97	1.16	1.15
	BH-09	80.42	14.46	5.11	1.16	1.15
	BH-10	77.63	18.01	4.36	1.17	1.15
	BH-11	82.24	14.12	3.64	1.16	1.14
	BH-12	72.33	22.06	5.6	1.17	1.17
	BH-12 Dup	74.59	17.7	7.71	1.16	1.17
	BH-13	84.32	12.14	3.55	1.16	1.14
Bulking Factor		**Average B.F. (all holes less dups)**			**1.16**	**1.15**
		5% Self Weight Consolidation			**1.10**	**1.09**
		7.5% Self Weight Consolidation			**1.07**	**1.06**

5.5 Description of Water

As discussed in Section 2, the overall project area consists of estuarine waters, fed two rivers. The waters of the Bonanza River split, travelling both NE and SW along the Bonanza Channel. The water passing the IPA travels from this river 5.1 miles SW discharging into Safety Sound. Safety Sound connects to Norton Sound (the Ocean) 4.3 miles SW of the general project area.

The water in Bonanza Channel is a combination of seawater and fresh water and currents are affected by the tidal influence.

5.5.1 Tidal Dynamics

Applicant has not collected detailed tidal data for the general project area, nor is there any pre-existing tidal data available for reference except for the MHW line from Alaska DNR GIS that is referenced in the maps throughout this narrative. The water depths in Bonanza Channel are affected by wind and storm surges more than they are by tide with the rare storm surges as high as 6.8 ft. AMHW during the winter months. Recent storm events and associated water levels for the Nome area are shown in Table 5-3. Storms within the annual mining activity window are very rare, with the largest recent storm event on September 27, 2019 recorded at 3.8 ft. AMHW.

According to the Nome tidal data, MLLW at Nome is only 1.33 ft. BMHW. The tidal range in the Bonanza Channel would be considerably less. Multiple visual observations by various employees and contractors of Applicant, review of drone footage, and other anecdotal evidence indicate very little tidal influence occurs in the IPA due to 1) a normal SW flowing water current from Bonanza River, 2) the narrow nature of the ocean inlet in Safety Sound, and 3) the distance from Safety Sound to the IPA. Based upon field observations and drone footage showing the water levels, beaches, and time of day, the MLLW is approximately 1 ft. BMHW in the IPA.

Table 5-3. Recent storm events and water levels in feet (NOAA, 2019)

Date	NAVD88	MLLW	MHW
9/27/2019	7.7	5.1	3.8
2/12/2019	8.9	6.3	5.0
2/20/2018	7.6	5.0	3.7
12/21/2017	9.7	7.1	5.8
1/1/2017	10.7	8.1	6.8
10/29/2016	10.3	7.7	6.4
11/9/2015	8.9	6.3	5.0
11/10/2014	7.9	5.3	4.0

Applicant will gather continuous tidal influence data during mining periods. Because storm surges and wind events are unpredictable Applicant has designed its project around a maximum 3.8 ft surge AMHW due to N-NE winds. As a secondary precaution, the standard operating procedure will be to suspend operations during such storm events to mitigate risk of potential turbidity release from the mining containment as water levels either rise or fall (depending upon the wind direction).

5.5.2 Water Current

Applicant has not collected data on the total acre feet of water that moves through the IPA, however Applicant has collected some water current data (Tables 5-4 and 5-5) that shows a general SW flow of water towards Safety Sound ranges from 2.5-7 mph (3.710.3 feet per second). These measurements in Table 5-5 were taken in the area of the perceived maximum flow, however currents do vary with respect to depth within the water column, depths of the channel, bends in the channel, and so forth. The measurement in table 5-4 was within the initial mining area (3.7 feet per second). The overall range of water current collected by Applicant has been incorporated into the design of the turbidity curtain containment.

5.5.3 Water Characteristics

Chemistry:
Because the operation will not discharge pollutants into the receiving waters (per the meaning of the Clean Water Act) and because there is no addition of materials, Applicant has not collected background water chemistry data characterizing the water in the Bonanza Channel, or more specifically the IPA. Other than temporary turbidity contained by the turbidity curtain, the mining proposed by Applicant will not alter the water chemistry.

Conductivity:
Exhibit 9 details conductivity and temperature measurements taken in nearby Safety Sound. Because the conditions are different upstream of Safety Sound Applicant has collected some conductivity tests in the IPA (Table 5-4). Though these tests are accurate, Applicant expects water conductivity to vary depending upon tides or storm events. For the purpose of this application, using these measurements, Applicant has considered the water to be fresh water, and considered the stricter fresh water quality standards in its application materials.

Turbidity:
Applicant has collected some turbidity readings across the general project area as shown in Tables 5-3 and 5-4 and Figure 5-15. Physical observations by Applicant's employees and consultants working in the IPA, and the high variability of the turbidity readings in Table 5-4 and Figure 5-15 support Applicant's conclusion that turbidity in the IPA is not static. Turbidity in a very shallow lagoon like this will be very dynamic, constantly changing with small breezes, heavy winds, tides, stormwater runoff, or spring snow and ice melt.

Because of the unpredictability of turbidity levels in the IPA and the plan to contain turbidity behind a turbidity curtain, no further turbidity measurements were taken.

5.6 Bathymetric Profile

Applicant attempted sonar and GPS bottom depth profiling, determining that most of the lagoon is too shallow (less than six feet deep) for this method to work. As a result, the approximated bottom profile BMHW is based upon limited site field measurements and drilling data.

Table 5-4. Background water sampling 9/23/19 in the IPA

Date: 09/23/19

Start Time:	**1:25 PM**	**Wind Speed Knotts**	**10**
End Time:	**3:48 PM**	**Wind Direction**	**SW**
Current Speed mph	**2.5**	**Water Depth Feet**	**2**

Test Points	900	901	902	903	904	905	906	907
Time	1:25 PM	1:29 PM	1:33 PM	1:35 PM	1:37 PM	1:39 PM	1:41 PM	1:43 PM
TEMPERATURE C	5.4	5.4	5.4	5.5	5.4	5.4	5.3	5.4
DO	11.72	11.78	11.82	11.76	11.88	11.89	11.95	11.88
Specific Conductance	2773	2219	2170	2801	1996	2018	1867	1928
SAL-ppt	1.44	1.14	1.11	1.45	1.02	1.03	0.95	0.98
pH	7.79	7.97	8	7.98	8.02	8.02	8	8.02
TURBIDITY (NTU)	4.46	3.31	3.36	3.51	2.92	2.76	2.65	2.62
GPS -(Lat-Lon)	N64°31'04.03"	N64°31'03.73"	N64°31'04.53"	N64°31'04.99"	N64°31'03.20"	N64°31'03.15"	N64°31'02.26"	N64°31'03.20"
GPS - Longitude	W164°34'33.69"	W164°34'35.65"	W164°34'35.66"	W164°34'34.33"	W164°34'32.75"	W164°34'34.44"	W164°34'32.00"	W164°34'35.50"

Test Points	908	909	910	911	912	913	914
Time	1:45 PM	1:56 PM	1:57 PM	1:58 PM	2:03 PM	2:08 PM	2:14 PM
TEMPERATURE C	5.4	5.5	5.5	5.4	5.4	5.4	5.4
DO	11.87	11.84	11.88	11.88	11.98	11.87	12.11
Specific Conductance	1996	2146	2401	2383	2078	2027	1739
SAL-ppt	1.02	1.1	1.23	1.22	1.06	1.03	0.88
pH	8.03	8.02	8.01	8.03	8.07	8.03	8.06
TURBIDITY (NTU)	2.67	3.15	3.15	3.3	4.32	2.78	2.3
GPS -(Lat-Lon)	N64°31'03.40"	N64°31'04.92"	N64°31'05.90"	N64°31'06.87"	N64°31'05.28"	N64°31'03.05"	N64°31'01.41"
GPS - Longitude	W164°34'37.96"	W164°34'37.75"	W164°34'35.11	W164°34'35.94"	W164°34'39.71"	W164°34'30.02	W164°34'36.31"

(All testing is done @ 2 feet increments until bottom is reached)

Applicant verified the depth data against drone footage to create the approximated bottom profile map (Figure 5-16).

During mining, the operation will continue to survey the bottom profile of all the claims using an RTK survey instrument, ultimately providing a more accurate bottom profile representation at the time of the survey (noting that the bottom profile in this environment is not static).

5.7 Gold Resource

Little is known about the distribution and overall quantity of the gold present in the general project area beyond the results of the core samples that have been taken, although there are reports of very good gold grades adjacent to the claim block near the Solomon River. Collier *et. al.*, (1908) identified the bluffs bounding the Bonanza Channel as likely to be marking an old sea beach and postulated that such beaches, if found, would likely prove to be as rich as the present beach at Nome. Contrary to the evidence for gold in this location the commonly held local belief is that no gold exists within the Bonanza Channel because there has not been any historic or

Table 5-5. Bonanza Channel background turbidity and water flow rates

Bonanza Channel & River Turbidity Measurement Exploration Study									
Date	Time (hh:mm:ss)	Lattitudfe / Longitude		File Name	Sample	Turbidity (NTU)	Flow (mph)	Flow (f/s)	Flow (m/s)
5/31/2019	12:41:20	N 64.32'34.9"	W 164.26'38.1"	BC1A	1	5.6	5.6	8.2	2.5
5/31/2019	12:42:20	N 64.32'34.9"	W 164.26'38.1"	BC1B	2	7.7	5.6	8.2	2.5
5/31/2019	12:51:35	N 64.32'00.0"	W 164.29'54.0"	BC2	3	10.9	3.5	5.1	1.5
5/31/2019	12:56:36	N 64.31'35.4"	W 164.31'26.6"	BC3	4	12.1	4.0	5.9	1.8
5/31/2019	13:00:30	N 64.31'32.3"	W 164.33'12.2"	BC4	5	4.3	0.0	0.0	0.0
5/31/2019	13:12:08	N 64.30'26.7"	W 164.36'47.6"	BC5	6	9.3	7.0	10.3	3.1
5/31/2019	13:19:01	N 64.31'14.3"	W 164.34'23.8"	DL1	7	12.4	5.5	8.1	2.4
5/31/2019	13:26:15	N 64.30'49.5"	W 164.35.35.8	DL2A	8	7.9	6.0	8.8	2.6
5/31/2019	13:30:06	N 64.30'49.5"	W 164.35.35.8	DL2B	9	8.1	6.0	8.8	2.6
5/31/2019	13:51:06	N 64.30'41.9"	W 164.36'01.5"	DL3A	15	9.5	3.5	5.1	1.5
5/31/2019	14:08:10	N 64.32'40.6	W164.26'13.1	BCBR01A	17	7.7	6.0	8.8	2.6
5/31/2019	14:09:10	N 64.32'40.6	W164.26'13.1	BCBR01B	18	6.0	6.0	8.8	2.6
5/31/2019	14:54:55	N 64.32'23.2"	W 164.29'45.9"	BR1	19	7.7	6.0	8.8	2.6
5/31/2019	14:56:13	N 64.32'42.1"	W 164.30'53.7	BR2A	20	6.3		0.0	
5/31/2019	15:00:28	N 64.32'42.1"	W 164.30'53.7	BR2B	21	6.1			
5/31/2019	15:03:30	N 64.32'18.5"	W 164.32'10.1"	BR3	22	6.8			
5/31/2019	15:06:56	N 64.32'58.0"	W 164.32'55.6"	BR4	23	11.6			
5/31/2019	15:11:29	N 64.32'52.2"	W 164.34'09.0"	BR5	24	7.7			
					Average NTUs	8.4			

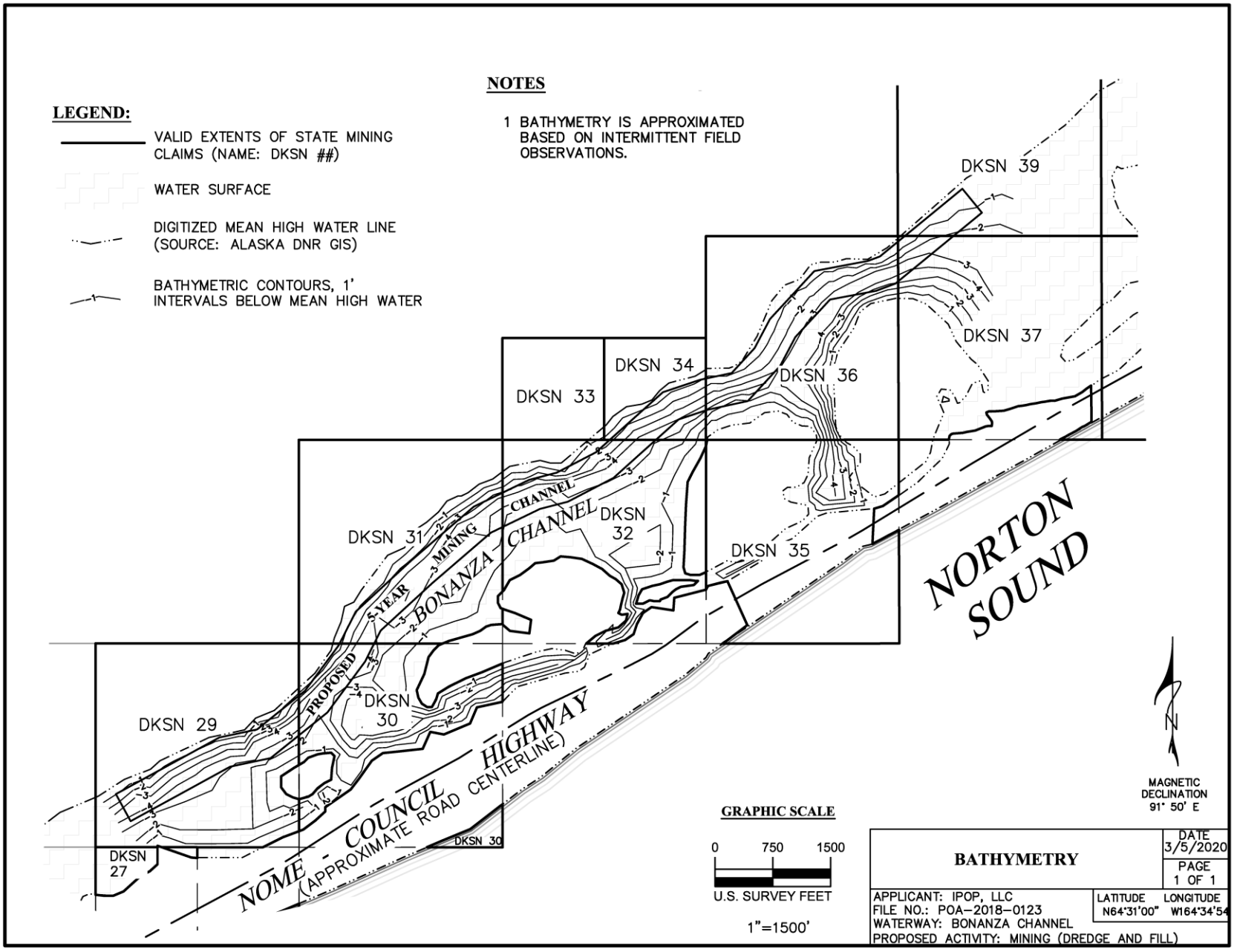
BC=Bonanza Channel
BR=Bonanza River
BCBR=Bonanza Channel Bridge
DL=Dredge Location (near as possible to planned plume study locations)

documented gold production from this area. This however can be explained by how this area was mined in the past (upstream, see Section 1.2) and the historic unavailability of technology to effectively recover fine gold (-100 to -400 mesh) as seen in the Bonanza Channel.

In general, placer deposits contain coarse gold near the source, and finer gold further away from the source. Gold in its natural state always contains chemical impurities such as silver, and dross (copper, lead, iron, etc.). These impurities make gold more resistant to abrasion during stream or ocean current transport. The gold found in Nome is very pure, averaging close to 900 fine, meaning 10% of the gold would be composed of silver and dross. Because the Nome gold is so pure, the Nome beach placer deposits often contain very fine gold (-100 mesh). In beach deposits such as Nome and the deposits in the Bonanza Channel the gold has been transported for long distances and ground very fine by waves hitting the beach obliquely. Thus ,the very fine nature of some of the gold in the Bonanza Channel is a direct result of severe storm and long transport distances.

Figure 5-15. Bonanza Channel Turbidity Measurements, May 31, 2019

Figure 5-16. Bathymetry map; elevation in feet BMHW (graphic scale is accurate, verbal scale refers to full size printed map)



5.7.1 2019 Exploration Drilling

In 2019 Applicant completed 13 test holes to 31 feet over an area 500-1000ft wide by 5,000ft long. This drilling occurred during the spring under ice bound conditions. Applicant used a GeoProbe© 540MT direct push drill to core a 2.25 outer diameter hole down to refusal (average 30 ft.). The drill core was drilled in 4 ft. increments (runs), each run was contained in a plastic pipe-like sleeve and boxed to be shipped to American Assay Labs for analysis. Because the samples were in plastic sleeves, they were unadulterated and essentially 100% of the recovered sample was retained.

The purpose of the drilling was to characterize the sediments as well as to explore for the presence of economical concentrations of gold. The Figure 5-17 illustrates the locations of those drill holes, Exhibits 8C, 8F and 8G detail the results of those drilling, and Exhibit 8D and 8E documents a strict chain of custody for those samples from the time they were collected until the time for which they were processed.

The 2019 drill holes were assayed at American Assay Labs in Sparks, Nevada for a 48-elemental suite, whole rock geochemistry, and size fraction analysis. Applicant did not fire assay for total gold as strict whole rock assay for gold in a placer deposit is not a standard procedure for testing for gold. Rather Applicant chose to combine 100% of the lab reject material and process it though a scaled version of the centrifuges that it has installed on its processing barge. Exhibit 8F and 8G shows the results of that test. Though the test does not describe the vertical or lateral distribution of gold in the sands, it does indicate the presence of a significant amount of gold present, estimated at 7 grams of gold from the 323 pounds of drill sample processed (representing an average calculated gold grade of 49 g/m^3 from the drill holes).

5.7.2 Delineation Drilling Plan

Figure 5-18 shows the delineation drill plan for the IPA, mining years 1-3. Applicant designed this drill plan to define the gold distribution across these mining areas both laterally and vertically. The drill plan consists of 235 holes laid out in a grid with the expectation of drilling one to two seasons ahead of the mining for planning/minimization purposes. As of this writing, no delineation drill holes have been drilled towards this goal, because the additional drilling has not been permitted.

5.7.3 Inferred Gold Resource and Economic Analysis

Though no reported gold resources estimated at this time for the BCPP the sands of the Bonanza Channel fit the definition of "ore" under 40 CFR § 440.141: *(13) "Ore" means gold placer deposit consisting of metallic gold-bearing gravels, which may be: residual, from weathering of rocks in-situ; river gravels in active streams; river gravels in abandoned and often buried channels; alluvial fans; sea-beaches; and sea-beaches now elevated and inland. Ore is the raw "bank run" material measured in place, before being moved by mechanical or hydraulic means to a beneficiation process*.

The 2019 drilling from the project area was successful in that it did indicate a strong presence of gold in the IPA as documented in Exhibit 8F and 8G.

Figure 5-17. 2019 drill hole locations (graphic scale is accurate, verbal scale refers to full size printed map)

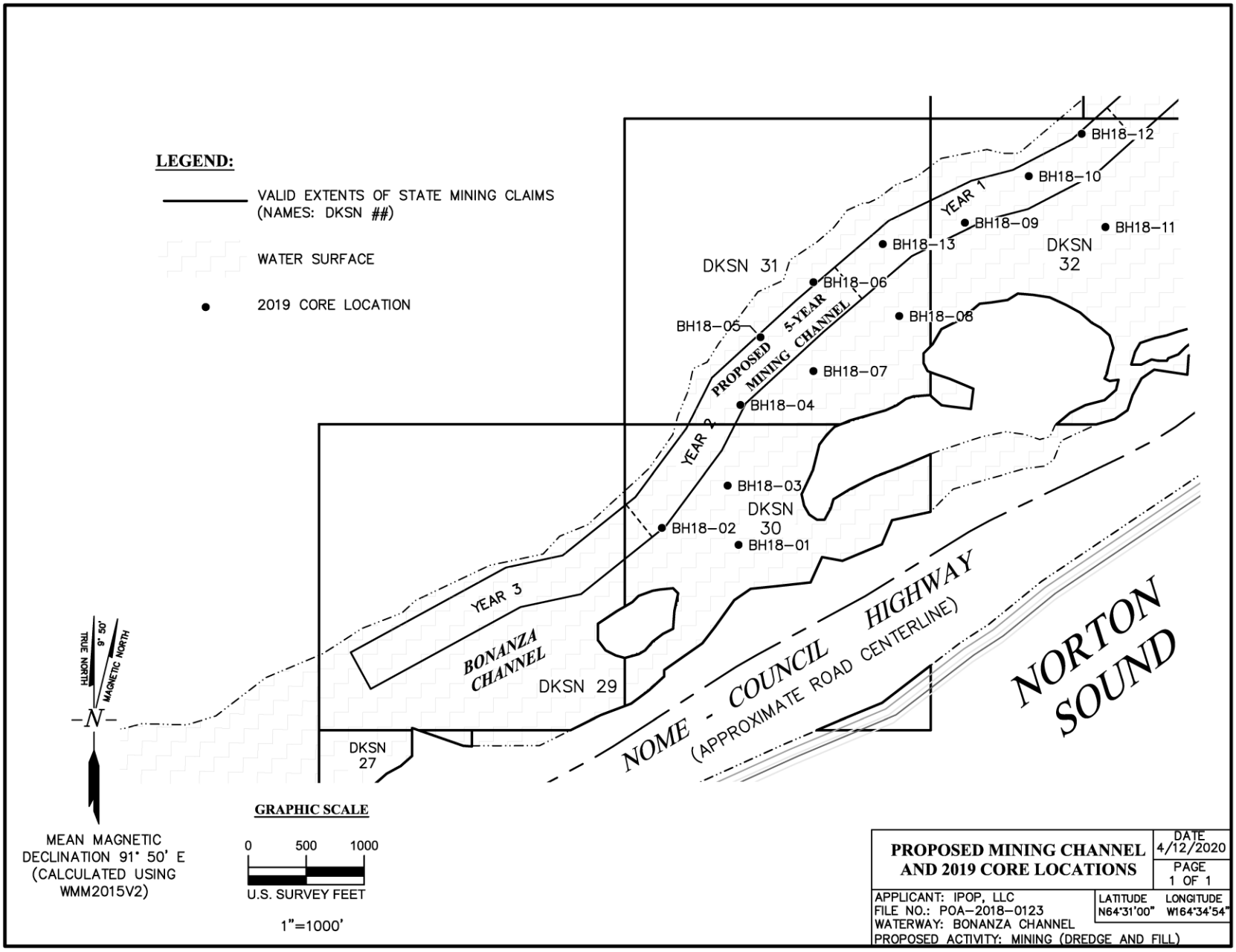
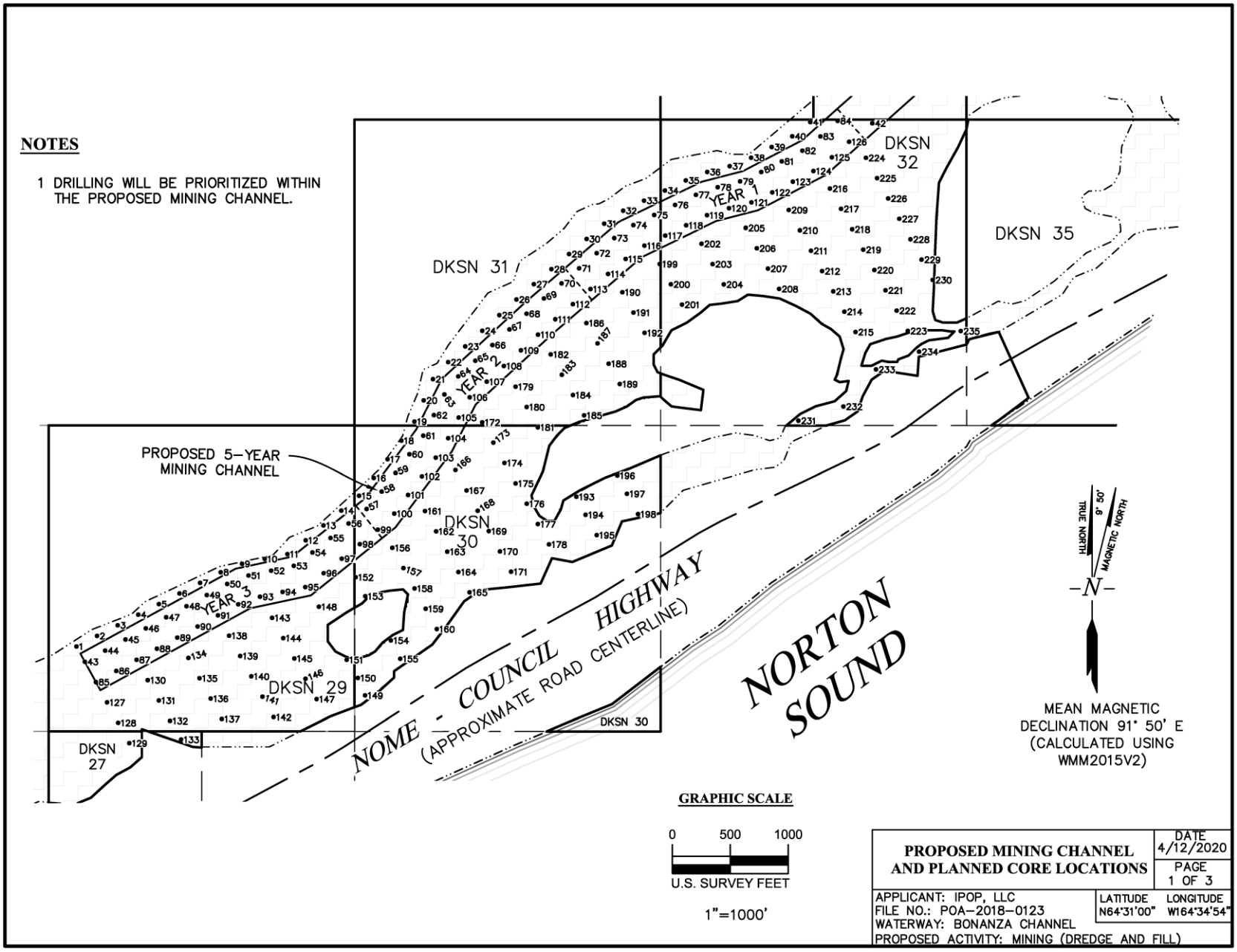


Figure 5-18. Planned delineation drill hole locations (graphic scale is accurate, verbal scale refers to full size printed map)



William J. Burnett, Certified Professional Geologist, has reviewed the drilling, sampling and processing methodology and the sample chain of custody and finds the data reasonable for estimating the economics/placer mine potential in the initial mining area. As such William Burnett calculated a break-even cut-off grade for the BCPP based on Applicant's estimated operating costs inflated by a contingency factor of 1.5. The variables considered in the economic evaluation are shown in Table 5-6.

Table 5-6. Key economic assumptions for BCPP cut-off grade

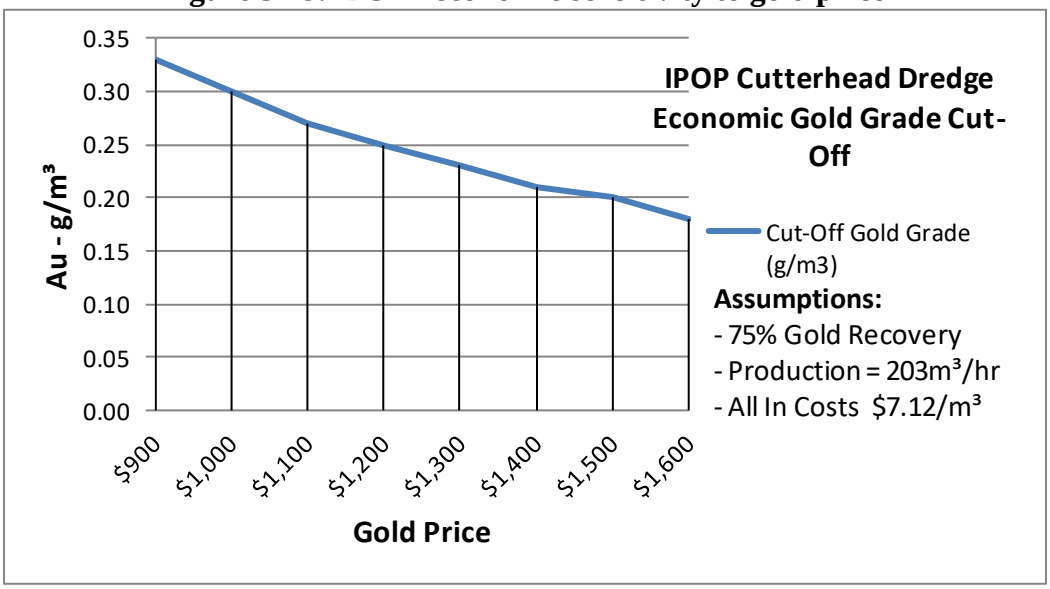
Cost Center	**$/m³**
G&A	$ 2.00
Fuel	$ 0.40
Camp	$ 0.50
Mining	$ 1.80
Processing	$ 1.32
Environmental Compliance	$ 0.10
Maintenance	$ 1.00
Total All-In Dredging Cost/m³	**$ 7.12**
Gold Price	$ 1,300
Recovery	75.0%
$/Gram	$ 31.35
Calculated Cut-Off (grams/m³)	**0.23**

On the basis of this economic analysis a lowest economic gold grade cut-off was determined using the designed throughput of 267yd³/hr (203m³/hr), 90% equipment availability, 75% gold recovery (the tests of the equipment indicate higher overall recoveries than this), and a 3 year running average gold price of $1300/ounce, the economic cutoff for this operation as designed is 0.23 g/m³. This is made possible by the highly efficient, low operating cost machinery developed by Applicant for this project.

Because of the high throughput, the project is not very sensitive to gold recovery or gold price. Figure 5-19 shows the cut-off grade sensitivity to gold price. At the date of this writing the gold price is over $1,700/ounce (off the chart in Figure 5-19; today's economic cut-off would be below 0.15 g/m³).

Based on the visual estimates of gold recovered from the 2019 drilling from the tests using the exact centrifuges that are installed on the processing barge, William Burnett is of the professional opinion that the area drilled in 2019 is economic to mine by the methods presented in this application if all operating costs assumptions are correct.

Figure 5-19. BCPP economic sensitivity to gold price



5.7.4 Future Exploration and Delineation Drilling

As demonstrated in this section, Applicant's project does not require significant gold concentrations to be economic. However, Applicant intends on-ongoing annual exploration and delineation drilling of its claims for planning and minimization purposes; focusing mining on the highest gold grade zones in the claim block. Applicant expects the drilling plans, techniques and processing/analysis of the core samples to evolve over time as more is learned about the distribution and size fractions of the gold.

5.8 Dredge Area Access Channel (5 Year Plan)

Figure 5.1 is an overview of the project showing the mining location, dredge material disposal sites, and the access channel inside and outside the IPA. The access channel (or trench) for the operation is also depicted in Figure 5-20 with corresponding cross sections shown in Figures 5-21.

The access channel is designed to be 50 ft. wide at the bottom with a maximum water depth of 10' BMHW. The dimensions and depth of the access channel may be adjusted shallower or narrower as experience dictates. The access channel slopes are expected to be an overall slope of 3:1 or steeper; therefore, at its maximum near the shore the access channel will be 104 ft. wide in plan-view, narrowing 6 ft. for every additional foot of water depth. The channel will average 85 ft. wide over most of its length (3,800 ft.) to the mining area.

The access channel will be extended and maintained throughout the length of the mining channel for continued access to current year and future year mining areas (see Sections 5.9.3 and 5.9.4). As both a safety precaution and a form of environmental mitigation, a categorical limit of three m.p.h. shall be imposed on all barges and tenders. Low speeds also will avoid problems from grounding on irregular shoals throughout the claims.

Figure 5-20. Access channel with cross section locations (graphic scale is accurate, verbal scale refers to full size printed map)

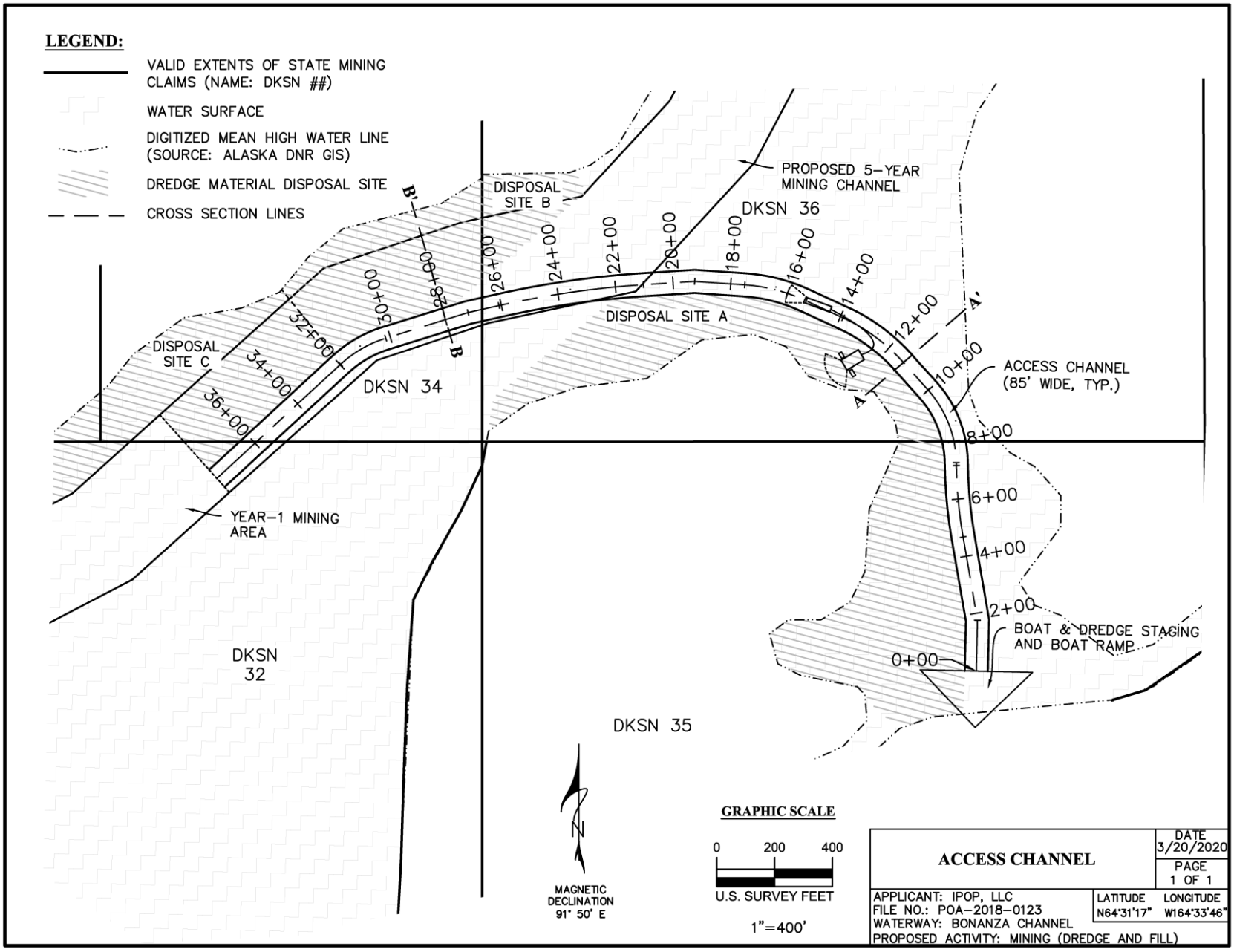
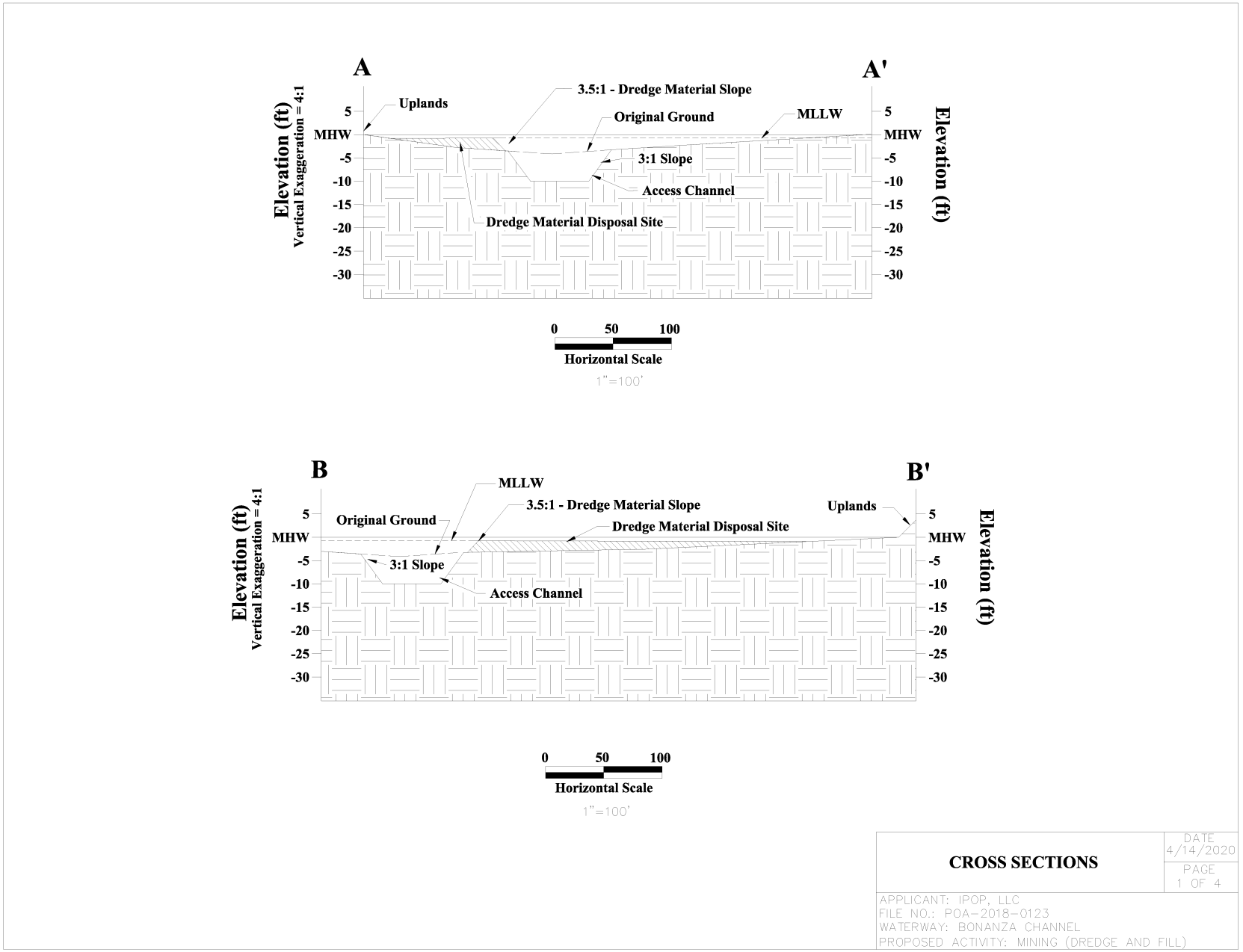


Figure 5-21. Typical cross sections of access channel dredge and fill: A-A' and B-B'



5.8.1 Dredged Material Disposal Sites (Access Channel)

Dredge material disposal sites (DMDS) are planned adjacent to the access channel and nearby islands or uplands. Considering the calculated bulking factor for the soils all of the material removed from the access channel is expected to fit in DMDS "A", "B" a portion in DMDS "C" BMHW (volumes listed in Table 5-7). Applicant will also temporarily deposit a portion of the material AMHW if material bulking exceeds expectations. Any such material will be reclaimed to MLLW at the end of each mining activity window

The access channel will be developed by dredging to planned depth and discharging the dredged soil by pipe or by processing barge into the DMDS. Turbidity from the development of the access will be controlled by using the turbidity curtains (see Section 5.10.1). The turbidity curtains will be anchored and sealed on the bottom of the lagoon, to contain all turbidity. Figure 5-22 shows the typical stages of access development and depicts the typical configuration of the turbidity curtains during the construction of the access channel.

5.8.2 Maintenance of Access Channel

As the access channel is critical for ongoing operations. Because there is literally no current in most of the area of the access channel, and because the operational plan is to dredge the channel to 10 ft. depth BMHW to start, maintenance requirements will be minimal.

5.9 Dredging Operations (5 Year Plan)

The nominal activity window is expected to be between June 1 and October 15 annually. Dredging is expected to occur 24 hours per day with a production rate of 267yd³/hr for the work window of 140 days. Assuming 100% equipment availability the operation will dredge at most 897,120 yd³ over an area of not more than 21.7 acres per year (considering design slopes of mining channel). Because of the nature of the equipment, and possible weather impacts to the operation, this production estimate is considered the best-case scenario; Applicant expects 90-95% equipment availability to be more likely during operations, so in actuality the annual acreage mined may be less than 21.7 acres.

The mining channel is designed around the capabilities of the dredge at 200 ft. wide at the bottom, 31 ft. deep from the surface of the water. Dredged trench slope angles are dependent upon the types of material being dredged and the depth of the trench and consideration of the most common instability mechanism for slopes, shear failure (Raaijmakers, 2005). Wave load was not considered in the design of the slope angles because of the shallowness of the estuary and the fact that wave effect rapidly peters out with depth. The trench slope is assumed to be an overall listric shape, standing at 2.7:1 (H:V) or 20 degrees near the top, and 3.7:1 at the bottom of the trench, for an overall average design slope average of 3:1 similar to breaching test results during suction dredging (Maertens, Van Alboom, Haelterman, & Couck, 2014). Consideration of the 3:1 (H:V) trench slope makes the overall mining trench width at the top 360 ft. wide at its maximum (see Figures 5-23 and 5-28 [*Cross Section C-C'*]).

The mining layout for years 1-5 is shown in Figure 5-24. This layout is based on a mining trench 360 ft. wide, located in a single continuous "mining channel" by capturing areas where the

Figure 5-22. Access channel development stages (graphic scale is accurate, verbal scale re. printed map)

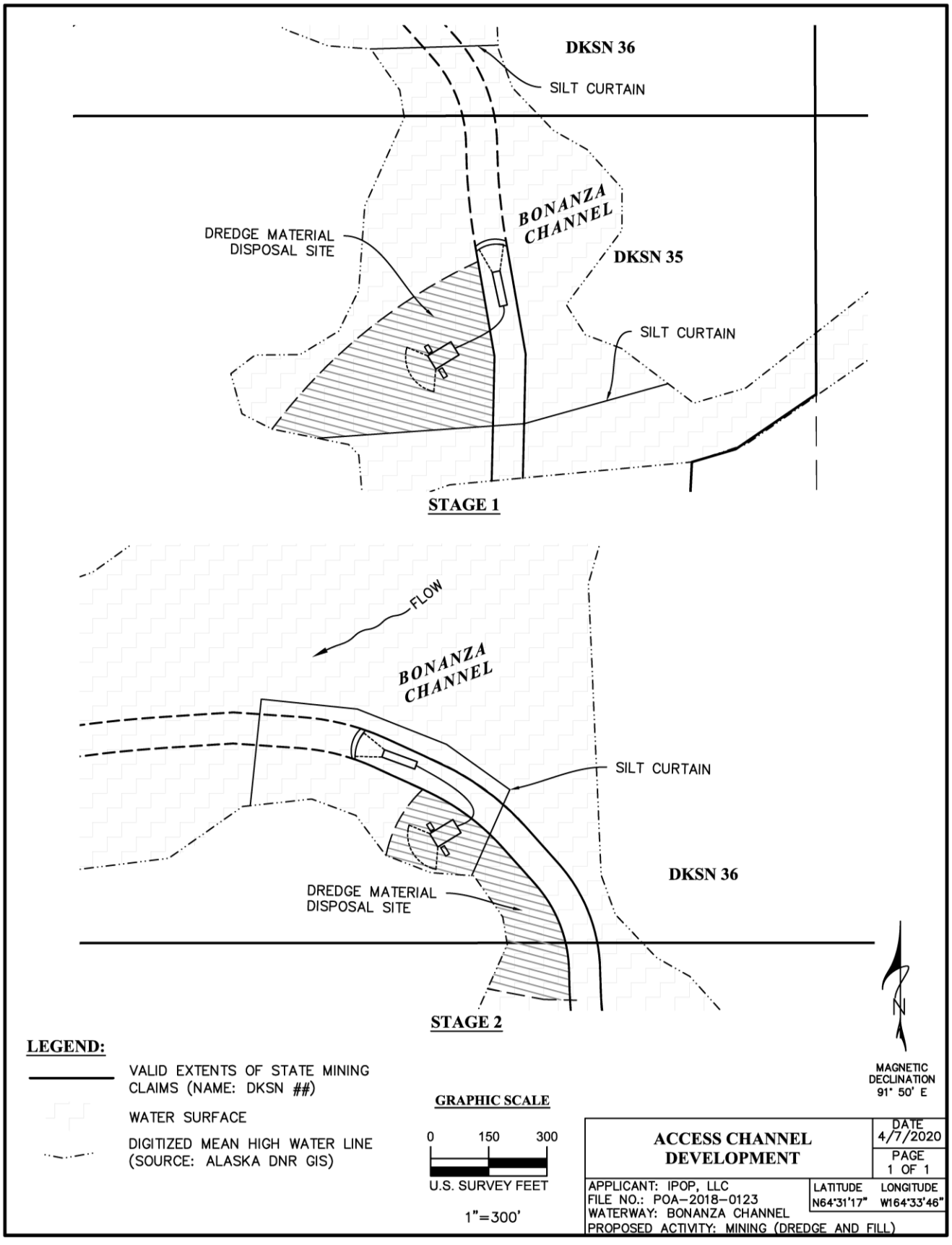


Figure 5-23. Typical dredging layout map showing typical BMP layouts, cut and disposal (graphic scale is accurate)

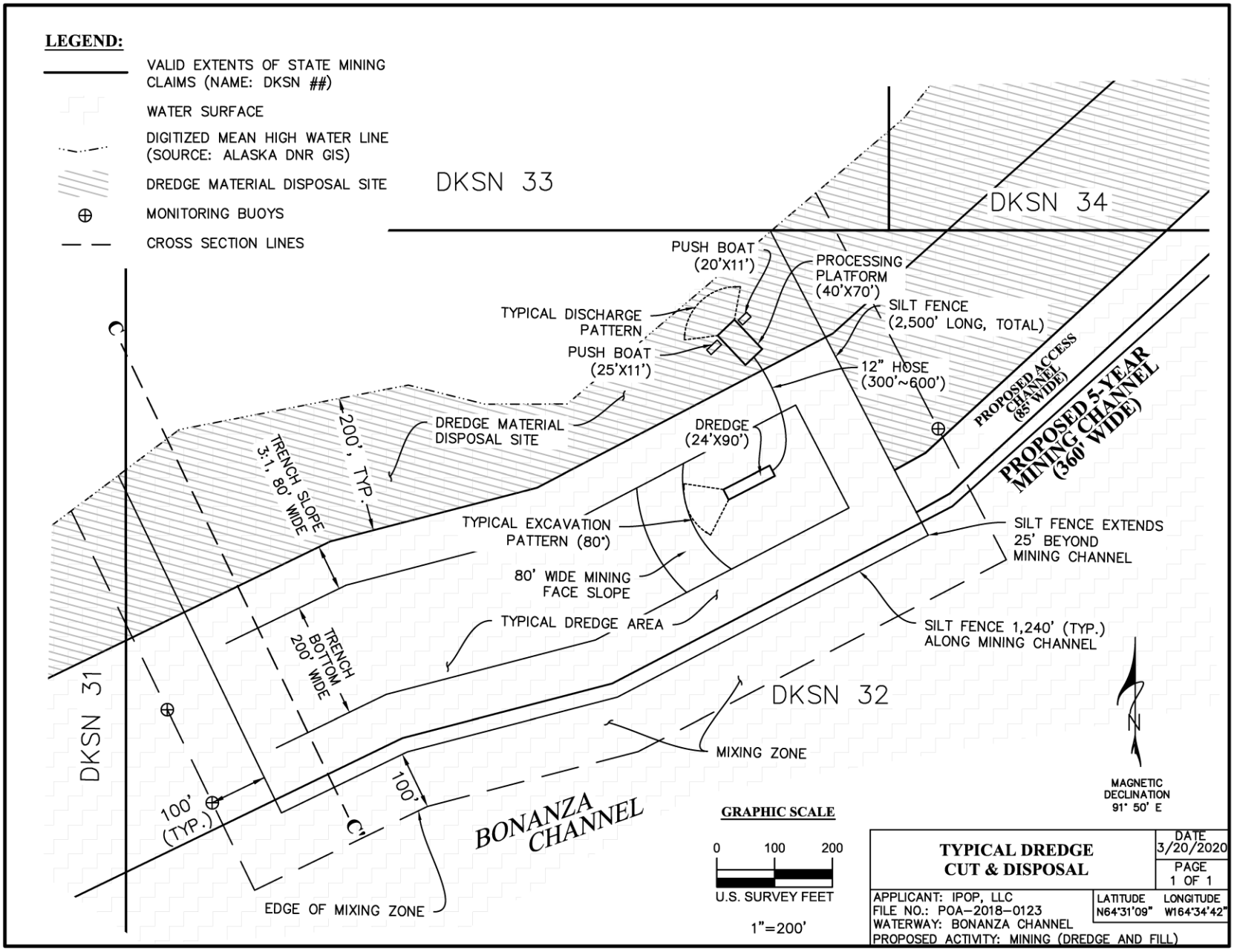
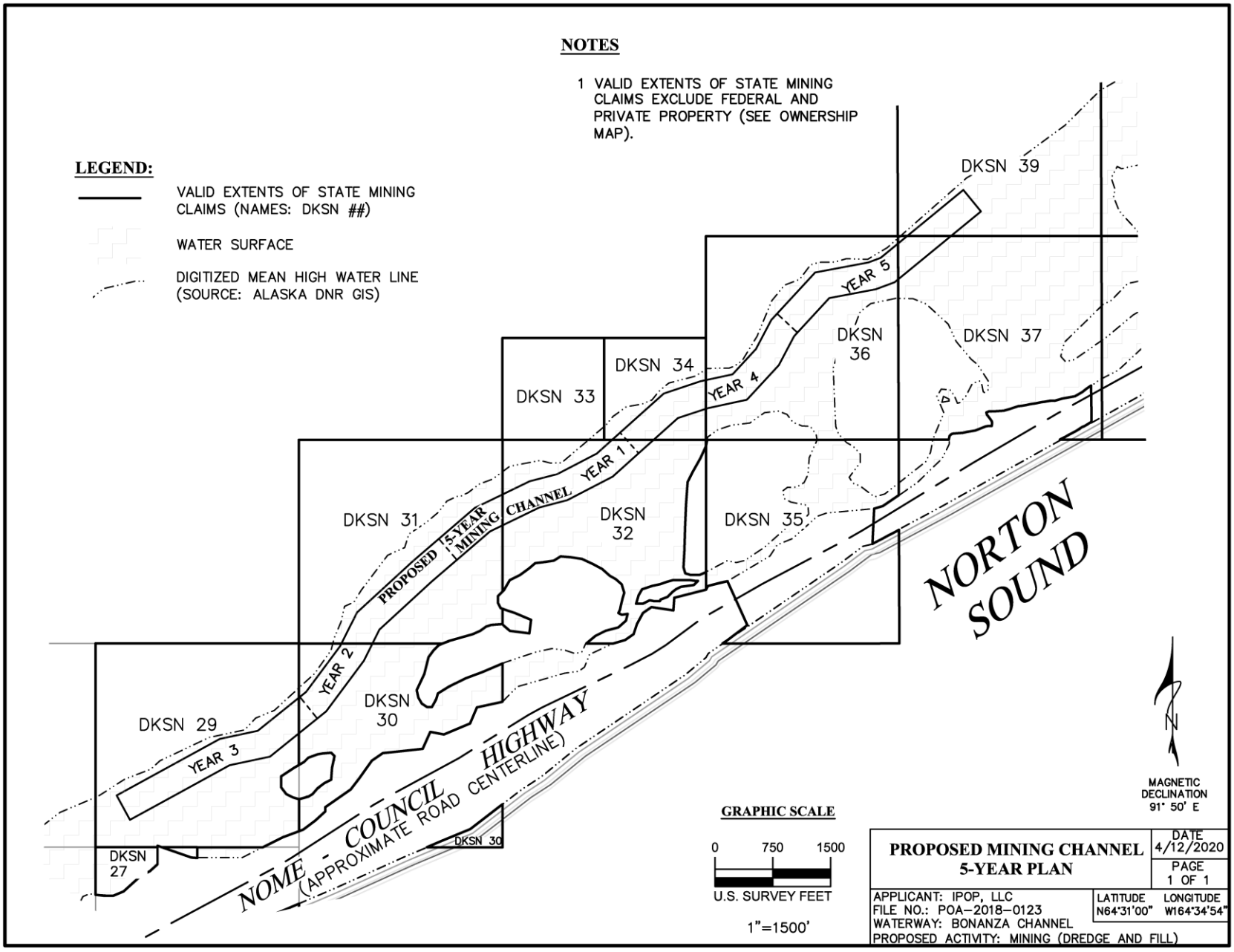


Figure 5-24. Five-year mine layout for IPA (graphic scale is accurate, verbal scale refers to full size printed map)



Applicant had conducted exploratory drilling in 2019 that indicated the presence of economic gold concentrations. The mining channel is continuous/linear to combine all dredge material disposal sites into a single area, and to mine systematically through the gold-enriched sands to a prescribed depth, resulting in a predictable plan, with predictable results, thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered.

5.9.1 Annual Sequence of Dredging Operations

Annual mining will be sequenced as follows:

Year 1-3. The area Applicant has chosen for mining during years 1-3 are those areas represented by the 2019 core drilling. Eight out of thirteen drill holes are within this section of the proposed mining area (See Figure 5-17).

Year 4-5. There is currently no drilling in the area covered by years 4 and 5. Applicant intends on drilling this area prior to mining.

5.9.2 Dredged Material Disposal Sites (Mining Channel)

Dredge Material Disposal Sites (DMDS) are planned as areas for initial deposition of dredged material from the dredge starting hole (described in Section 5.9.3, *Stage 1*), and for storage of excess (or bulked) dredged soils. The operation expects there to be enough storage capacity for these purposes at or BMLLW; however, Applicant may temporarily deposit some material AMLLW in special circumstances (see section 5.9.4). DMDS for the mining are all located on the N side of the mining channel, between the mining channel and the uplands Figure 5-1 and Figure 5-25.

Considering an estimated overall bulking factor of 1.16, and a consolidation of 7.5% of the bulked material with time and self-weight consolidation (reducing the average bulking factor to 1.075), the DMDS are expected to have enough volume to accommodate all bulking expected from this operation. Table 5-7 details the project areas, calculated storage capacities, and estimated dredge and fill volumes within wetland areas for years 1-5.

5.9.3 Stages of Dredging Operations

The typical stages of the dredging operation are shown in Figure 5-26 and 5-27. Corresponding cross sections are shown in Figures 5-28, 5-29 and 5-30. The stages and figures are described in detail below.

Stage 1. As with all the dredge stages, the turbidity curtain is installed before any dredging takes place (see Section 5.10.1). As the dredge is preparing to mine, its computer system is mapping the bottom of the channel, creating a 3D point cloud from sonar and on-board differential GPS. Once the dredge begins to excavate its initial hole at the start of a mining season all excess dredge soil is processed and deposited within the DMDS location starting in the adjacent mining area and extending into the current mining area. The dredge tailings are deposited either off of the processing barge (if the water is deep enough) or by a discharge pumping and pipe system

extending 300 ft. – 600 ft. from the processing barge. All slopes of the dredge trench are assumed to be approximately 3:1 as described above.

Stages 2 and 3. Once the initial dredge hole is established the processing barge begins to backfill the mined-out trench with processed tailings, filling the trench and DMDS in accordance with how much bulking the operation is experiencing, up to MLLW. As shown in the cross section (Figure 5-29, *Cross Section F-F'*) the access channel will be left unfilled.

Stage 4. When necessary, dredging will temporarily shut down, allowing suspended solids and turbidity to settle out, after which the operation will relocate the turbidity curtain down the mining channel and mining will continue as before.

Table 5-7. Estimated dredge and fill volumes and area acreage

Item Description	Acres	Storage Capacity (CY)	Dredged Volume (CY)	Bulked Dredged Volume* (CY)	Fill Type and Volume Soils		Fill Volume Summary		
					Wetlands (CY)	Uplands (CY)	Wetlands (CY)	Uplands (CY)	Total (CY)
Access trench	4.2	0	33,200	35,690					
Year 1	21.7	957,346	900,000	964,404	957,346	0	957,346	-	957,346
Year 2	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Year 3	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Year 4	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Year 5	21.7	957,346	900,000	964,404	941,427	0	941,427	-	941,427
Dredge Disposal Site A	14.6	13,666			13,666	0	13,666	-	13,666
Dredge Disposal Site B	7.1	7,019			7,019	0	7,019	-	7,019
Dredge Disposal Site C	19.7	22,977			22,977	0	22,977	-	22,977
Dredge Disposal Site Yrs 2-5	22.9	143,600			55,304	0	55,304	-	55,304
Totals	176.9	4,973,992	4,500,000	4,822,020	4,822,020	-	4,822,020	-	4,822,020

**Assuming 1.075 bulking factor*

5.9.4 Description of Discharge and Reclamation

No chemicals will be used in the processing of the ore. All of the discharge will be clean tailings from the dredging operation only, re-deposited into the bottom of the estuary in an effort to distribute material evenly at or BMLLW. The operation would like to reserve the right to discharge AMLLW in certain cases where the operation does not have enough adjacent DMDS to accommodate excess material from bulking or from establishing an initial dredge hole (*Stage 1*, Section 5.9.3).

Reclamation will be concurrent with mining. If no bulking occurs, the operation will redeposit the material in an effort to establish the bottom to its pre-mining elevations as the processing barge passes over the excavated mining channel with the exception of the access channel which will be left at its designed depth 10 ft. BMHW (Figure 5-29 *Section F-F')*. The processing barge is moved and positioned by four on-board electric winches w/anchors, located at each corner of the barge. As the processing barge follows the path of the dredge, the push boats will use depth sonar and GPS location mapping, to move it over the excavated site. The excavated area will then be filled in, leaving the bottom as close to where it was originally if there is no significant material bulking.

Figure 5-25. Year 1 development showing DMDS C (graphic scale is accurate, verbal scale refers to full size printed map)

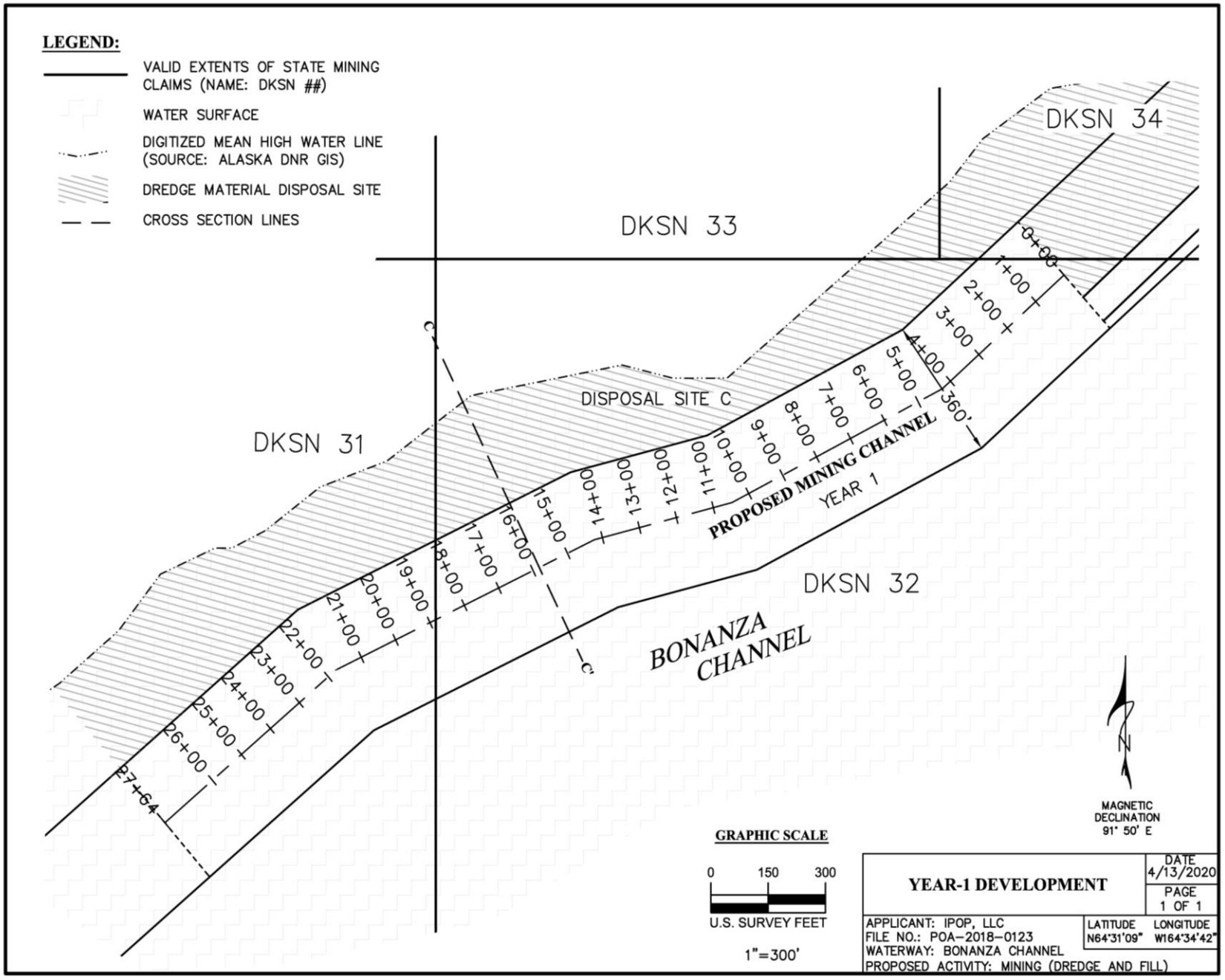


Figure 5-26. Typical dredging and filling stages (part 1) (graphic scale accurate)

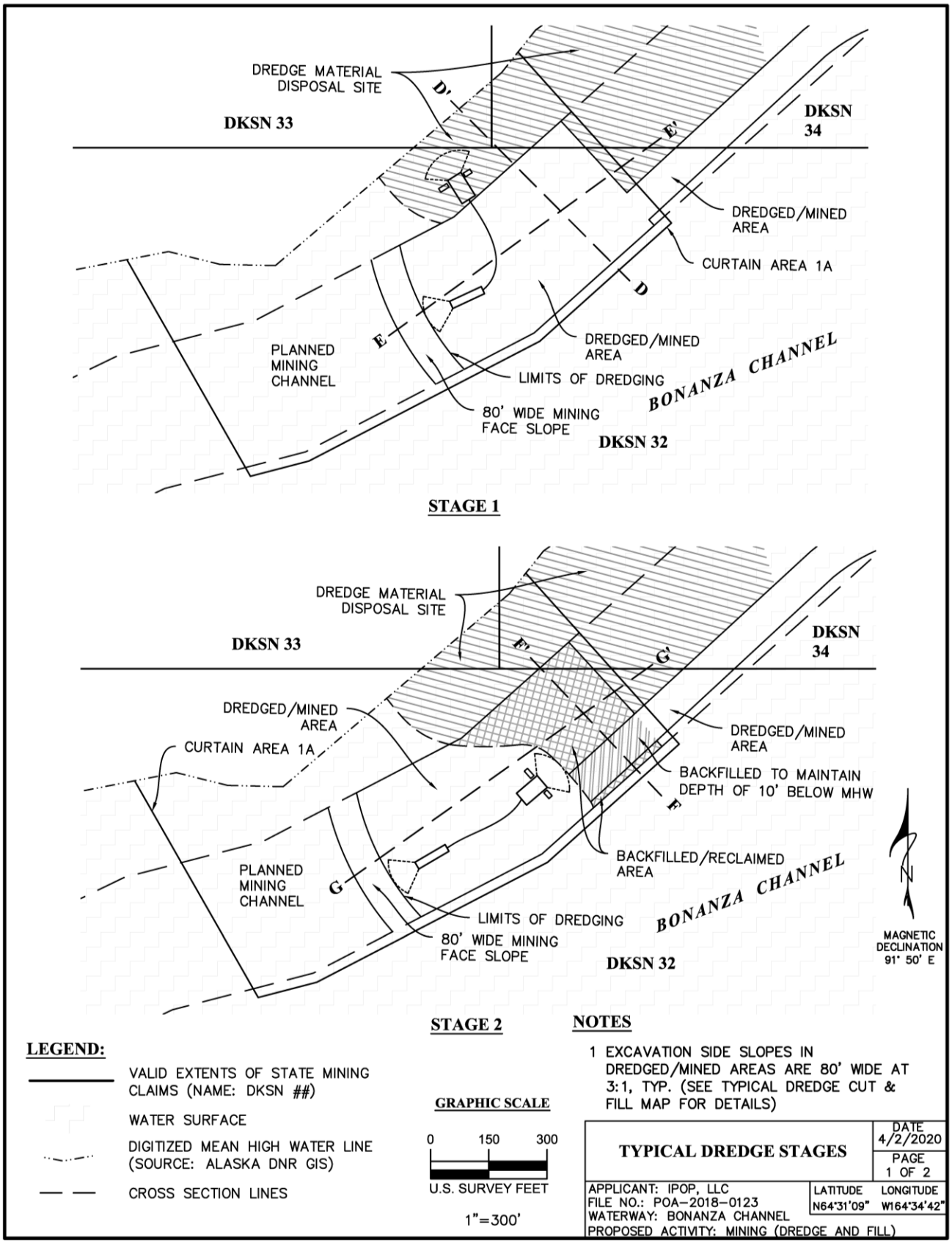


Figure 5-27. Typical dredge and fill stages (part 2) (graphic scale accurate)

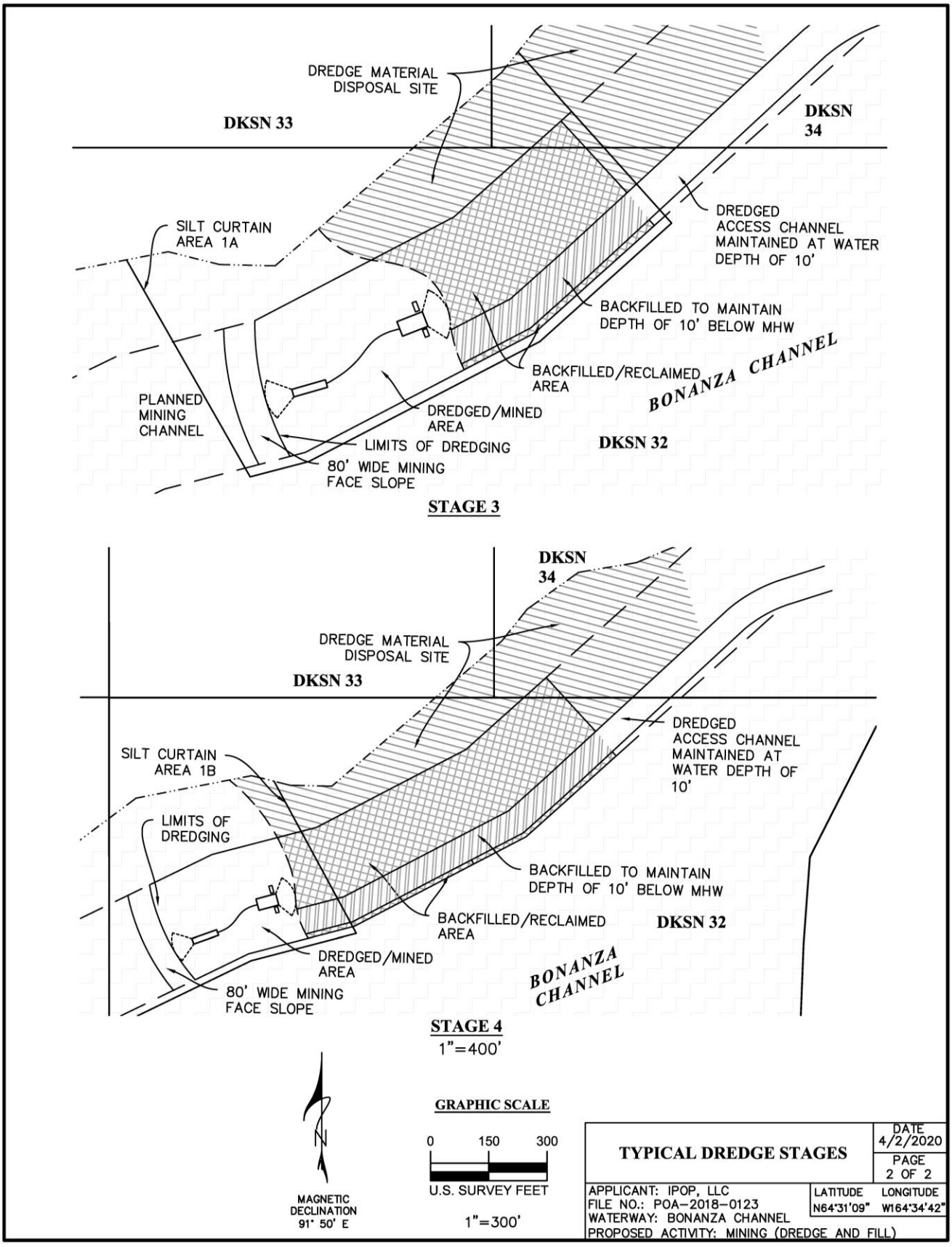


Figure 5-28. Cross sections of typical dredge and fill: C-C' and D-D'

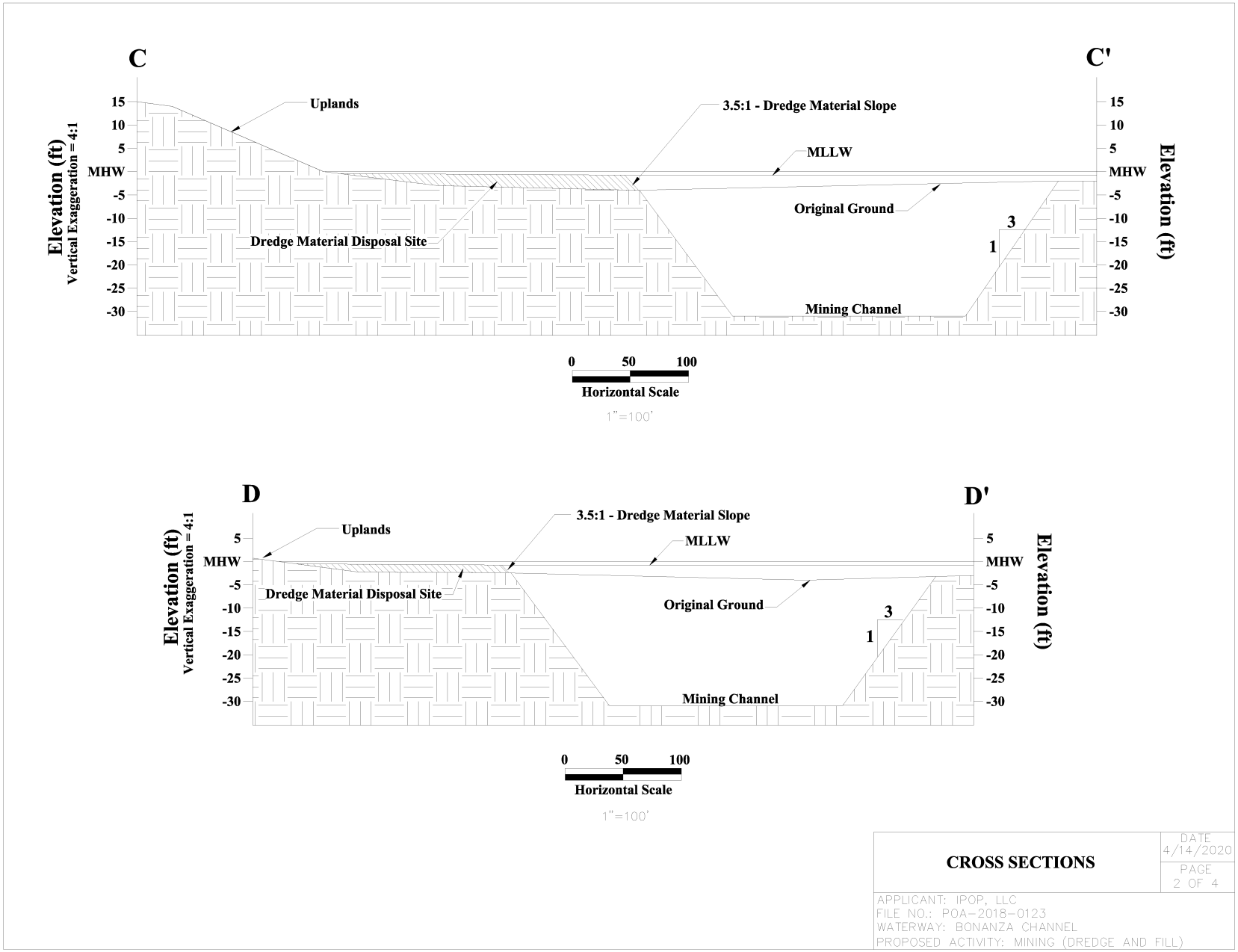
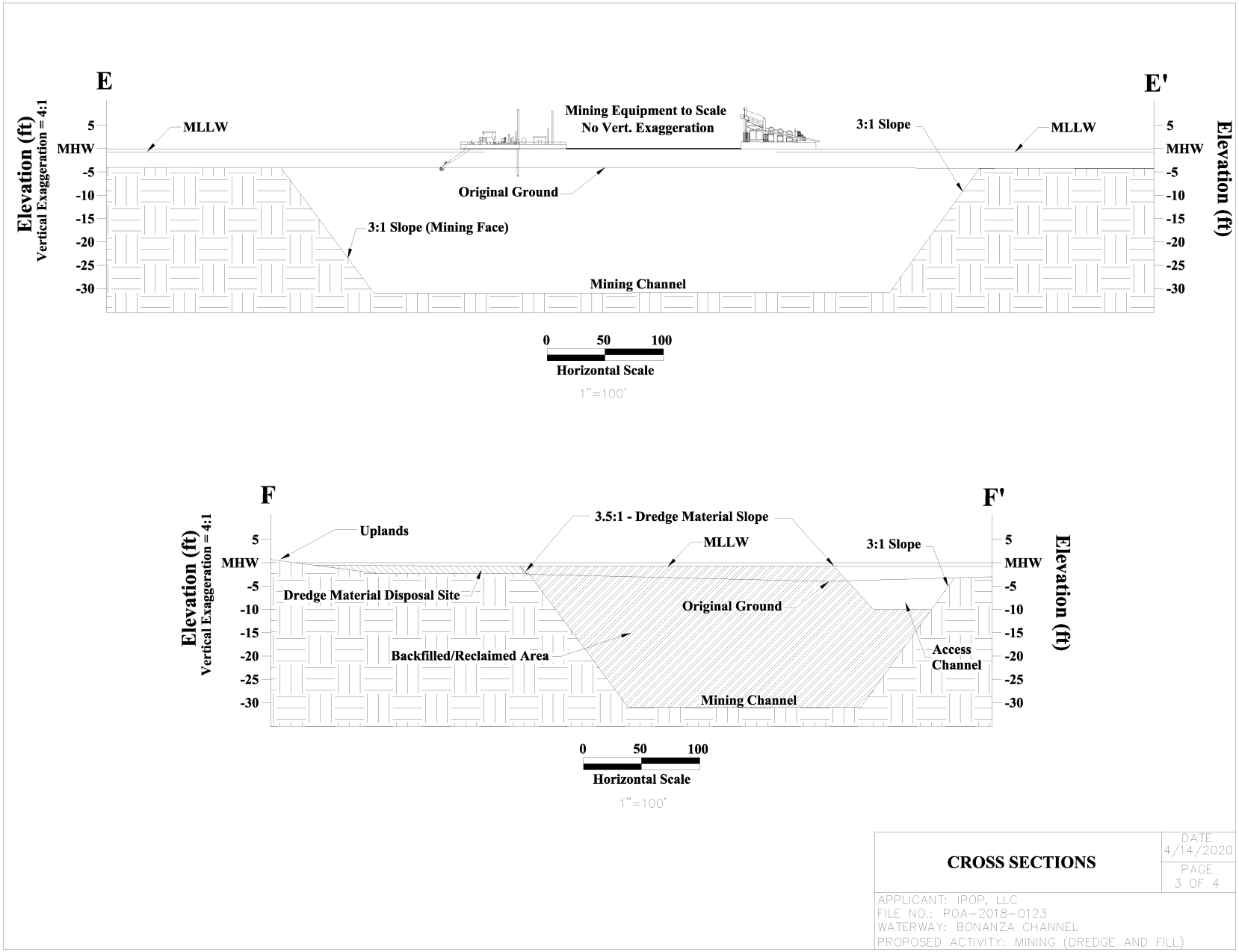


Figure 5-29. Cross sections of typical dredge and fill: E-E' and F-F'



Because of the draft of the processing barge, discharge directly from the processing platform will only be possible in waters deeper than 2' 9". In all shallower areas the discharge will be from a single pipe up to 600 ft. long (transporting a pumped tailings slurry to the shallow areas of the DMDS), or from a combination of processing platform outfalls in deeper waters (*Outfall 1*) and a pumped slurry that concurrently moves sand to the shallow areas of the DMDS.

The filled material will compact back down to its pre-mining state within 2-3 years

5.10 Best Management Practices

Best management practices will be applied where applicable to this operation as follows:

1) Safe fuel handling.
2) Additional pre-season site surveys and photographic inspections for eelgrass.
3) Continuous wildlife and fish monitoring within the mining area.
4) Continuous turbidity, conductivity, current, tidal and weather monitoring within the mining area.
5) Strict adherence to speed limits both with trucks and other vehicles on the local roadways and with boats within the waters of the U.S.
6) All flow of surface water in the Bonanza Channel will essentially be allowed to flow around the operation area unimpeded.
7) No berms or dikes will be constructed for this operation, only the temporary turbidity curtains.
8) No pollutant materials will be added to the process water no statutory pollutants will be discharged from the operation.
9) The operation will be within a secondary containment, described in the following sections. The process water used for the operation will be from its secondary containment only; no new water will be needed as make-up water.
10) The secondary containment will act as a turbidity/suspended solids retention structure. This feature will be maintained to continue its effectiveness as described in section 5.10.3. Additionally, the secondary containment will be monitored and maintained to protect it from unexpected or catastrophic failure.
11) All operations will cease during storm events that threaten to raise the water levels in the mining area or to destabilize the turbidity curtain.

5.10.1 Turbidity Control

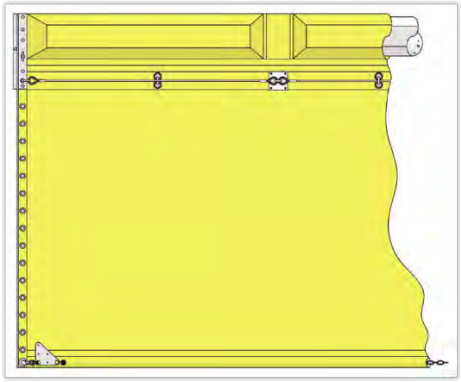
Turbidity is expected from this operation, and turbidity within the curtained area will certainly cause exceedances above extent freshwater quality standards for turbidity. However, most of the material will settle out rapidly All high turbidity areas are contained by the turbidity curtain. Applicant understands that the Alaska Department of Environmental Conservation (ADEC) will allow a mixing zone for the operation which will extend 100 ft. beyond the boundary of the turbidity curtain (Figure 5-23). Applicant determined that in order to meet stringent water quality standards in a non-static environment it will employ best management practices (BMP) to its operation incorporating a full operational containment solution with water quality monitoring equipment outside of the containment within the range of the 100 ft. mixing zone starting at the

boundary of the BMP. Accordingly, Applicant has acquired ELASTEC Type III RuffWater Screen turbidity curtains to control turbidity and other mining impacts on areas outside of the mining operation. Exhibit 10 shows some turbidity curtain case studies.

5.10.2 Background of Ruffwater Screens

The Type III Ruffwater Screen Turbidity Curtain is a heavy-duty premium barrier designed for use in tidal areas or areas where adverse conditions can occur. Floation billets suspend the top of the curtain; the bottom of the curtain is weighted and has anchoring points or additional weight pockets. The curtains are designed to be linked together continuously. Figure 5-30 is a section of the typical curtain. Exhibit 10 shows curtain specifications. This brand of turbidity curtain is designed for use in demanding water conditions. The curtain intercepts debris and slows the movement of rough water, helping to keep marine habitats safe. The conditions that these curtains were developed for are far in excess than those expected to be encountered in the Bonanza Channel.

Figure 5-30. Section of Type III Ruffwater Screen Turbidity Curtain showing floatation and curtain



The RuffWater Screen is designed for sediment and silt control to protect fragile environmental conditions. An example of the successful application of this technology was the California Department of Transportation's (CALTRAN) Crissy Field Drainage Improvement Project; the manufacturer's video concerning installation and use of the of the turbidity curtain may be seen at https://vimeo.com/140186579 and in Figure 5-31 below. Exhibit 10 details a relevant case study.

The RuffWater Screen was installed to mitigate silt and turbid water in the construction zone in a muddy bay. This project has received several environmental awards and recognitions. The following testimonial letter of success was written to Elastec by Eltora Charles, Civil T.E. California Department of Transportation

> *On behalf of Caltrans I would sincerely like to thank you and your crew for our turbidity control curtain. Thank you to the Elastec family for assisting Caltrans in designing a Best Management Practice that has been both cost effective and has exceeded our expectations in performance. Recently I was observing the waves onsite crashing against the shoreline - the winds were so strong they were blowing*

our plastic covers about; however, the turbidity curtain remained intact and during dredging operations there was no visible notice of turbidity outside of the curtain! It performed like a champ!

The curtain installation was conducted by Elastec and monitored by the media, California Department of Transportation (Caltrans) and marine biologists.

Figure 5-31. Type III Ruffwater Screen Turbidity Curtain being deployed in San Francisco Bay, CA.

5.10.3 Turbidity Curtain Configuration

Applicant has in its inventory 2,550 total lineal feet of 18oz turbidity curtain (see Exhibit 10 for specifications). Specifically, Applicant has:

- 20ea 50 ft. Type III Elastec Curtains with filter windows (1,000 linear feet)
- 31ea 50 ft. Type III Elastec Curtains without filter windows (1,350 linear feet)

The curtains incorporate furling lines for easy lifting and repositioning of curtain during the operating season. The curtain will also include a small gate over the access channel that can be opened and closed to allow sufficient access and egress for re-supply and personnel transport into the operational area.

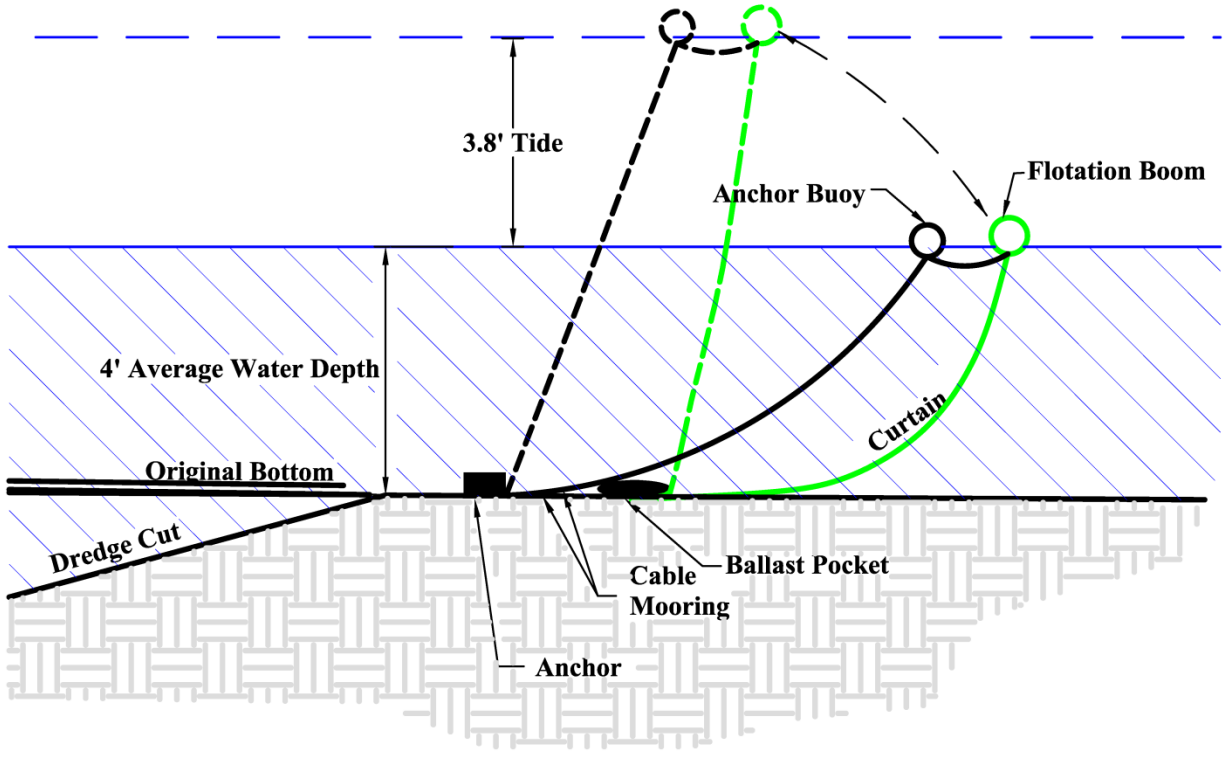
The turbidity curtain configuration differs for the development of the access channel and the mining (generalized configurations are shown in Figure 5-22 and Figure 5-23). In both cases the configuration takes into account the appropriate hydrodynamic conditions (water flow, depth, etc.) such that the environment, safety and navigation is not compromised by the curtain. Typically, the curtain configuration for mining will be more rounded than as depicted in the generalized configuration. The configuration will be a "U" shape, with the shore forming the fourth side of the containment. Each setup will be 10-14 acres in area and contain seven to twelve million gallons of water. To keep the curtain from flaring upward toward the surface due to tidal forces and wind, the curtain is weighted at the bottom and the configuration is designed to bottom mount the curtain with ballast, various sized anchors, soil augers and/or small steel h-piles to provide a protective

seal against the bottom and to provide certainty that it remains in place during operations (Figure 5.32).

Due to the likelihood of the turbidity curtain to deflect in a concave pattern relative to the forces of outside currents and/or the chance of the curtain lifting off of the bottom, filtered window sections are incorporated into the design that let water through yet retains small sediments. If necessary, the project may need to install sections of the curtain as break water barriers to deflect the current around the containment. Alternating the two types of turbidity curtains will maintain consistent pressures and water levels inside of the containment relative to the outside of the containment thereby stabilizing the entire curtain configuration.

Factors that can cause damage to turbidity curtains include high winds/storms, prevailing currents, flooding tides, and floating debris. The configuration of the bottom mounted design, filtered segments, shallow nature of the lagoon 1-6 ft. (nominally 2-4 ft.) and lack of floating debris in the Bonanza Channel will protect the turbidity curtain containment from potential damage.

Figure 5-32. Typical BCPP turbidity curtain bottom mounting configuration illustrating movement with tides and storm surges



5.11 Monitoring Plan

The types of monitoring expected include baseline monitoring and compliance monitoring. The objective of the baseline monitoring is to collect data that documents the current conditions of the estuary. The objective of compliance monitoring is to ensure that Applicant operates and closes each mining season within permit limitations, minimizing impacts to the environment.

5.11.1 Water monitoring

The operation will carry out continuous, real time monitoring of tidal influence, currents, pH, temperature, conductivity, weather patterns, and turbidity during the mining period to help refine future operations and provide useful data to the regulatory agencies regarding both background water and water conditions during operation. The baseline water monitoring program will focus on the areas nearest and up gradient of the dredging operation. Monitoring down gradient of the operation will collect data to monitor and minimize potential impacts from the mining operation. Additionally, monitoring will be conducted inside of the containment area. In addition to water monitoring, these stations may also be set up to monitor weather, correlating storm events, wind speed and direction, to all the other data being collected.

Monitoring will be done with floating monitoring buoys, bottom mounted tripod monitoring stations, and gauge stations along the shores. Proposed is a single background monitoring station up current of the operation, and one or two down current of the operation. The monitoring stations will upload real-time continuous data to the cloud via Wi-Fi telemetry and send alarms/notifications to the dredge operator in the event that the operation goes out of compliance on turbidity. The monitoring devices will include sensors for temperature, conductivity, salinity and turbidity. One of the monitoring stations will include a met sensor that measures wind speed, wind direction, air temperature, barometric pressure and GPS. A real time current meter also with Wi-Fi telemetry and sensors for water level, temperature, and possible bi-directional velocity in multiple cells may also be installed.

Additionally, the project has handheld sampling units with sensors for temperature, conductivity, salinity and turbidity, and a separate handheld unit for measuring water current. The handheld device will be used periodically to monitor turbidity inside of the containment area.

5.11.2 Visual Monitoring

Visual monitoring and inspection of the turbidity curtain will be conducted on a continual basis by the operational staff and noted in daily logs. Operation personnel will be instructed to look for unusual signs such as changes in shape of the containment, or escaping turbidity as well as any unusual watercolor or sheens. The monitor will watch for filter sections that need cleaned, for effectiveness of the turbidity control devices and request additional controls or notify the operation to slow or cease dredging when turbidity rises above acceptable levels. Visual monitoring will also be conducted daily along the access channel from the boat ramp to the mining area, and around the camp site looking for fuel spills, or anything else unusual.

5.11.3 Wildlife Monitoring

The operation will conduct daily monitoring of wildlife. Specific areas that will be monitored on a continuous basis are the dredging containment, shallows constructed by the operation, and the access channel between camp and the dredging area. A log will also be maintained of wildlife sightings in the project area that include bear, moose, caribou, seals, and other furbearers. Operations personnel will not log birds or other smaller wildlife typically observed in the project area.

All of Applicant's employees will be instructed to report unusual wildlife encounters and mortalities of fish, birds or other wildlife to the operations manager. Wildlife mortalities that occur within the general project area will be reported to the Alaska Fish and Wildlife Service (USF&WS), National Marine Fisheries Service (NMFS), ADF&G, ADNR office of Habitat Management Permitting, Fairbanks office, and ADEC. All carcasses can be made available for collection by the USF&WS or ADF&G, if required by the agencies. Any wildlife mortalities due to defense of life and property will be recorded in a log maintained with the operations manager and reported to the ADNR Office of Habitat Management and Permitting, Fairbanks, Alaska and the Alaska Department of Fish and Game (per State reporting requirements).

Applicant will comply with all wildlife reporting requirements as established in the permitting process.

5.11.4 Monitoring Records and Reporting

Field activities pursuant to the monitoring plan will be recorded on field forms that will contain the following information:

- Location, date, time of inspection
- Person(s) performing the inspection or monitoring activity
- Observations and/or measurements
- Calibration and maintenance of instrumentation
- Laboratory performing any analysis
- Chain of custody records for any laboratory analysis
- Laboratory reports; and
- Consultant or engineering report

During the period of operation, closure and reclamation all records associated with the monitoring activities will be retained by Applicant or a representative of Applicant for a period of 3 years.

Monitoring reports will be submitted quarterly to ADEC and ADNR. All quarterly reports will be submitted not more than 60 days after the last day in the quarter, in hard copy and electronic format. In addition, an annual report will be prepared for each year through December 31 and will be submitted to ADEC and ADNR on or before March 1 of the subsequent year in hard copy or electronic format. The electronic reports will be prepared in accordance with requirements set forth by the ADEC and ADNR. Annual reports will summarize all visual geotechnical and water monitoring that has taken place during the year. Quarterly and annual reports will include information necessary to determine data validity, data variation and trends, and any exceedance of limits.

5.12 Seasonal Start-up and Shut-down Procedures

The BCPP is a seasonal operation, operating within the activity window June 1 through October 15. Dredging operations will commence as soon as winter ice is gone any time after June 1. IPOP will transport the camp, containers, barges and other equipment to the access parcel (staging location) and assemble and stage the system in the water as described in section 5.2. Once the

dredge barge and processing barge are floating in the access channel, the flexible hose will connect them and the units will proceed northward between the two islands on a path for the Initial Operational Area.

At the end of the operation activity window (October 15) or when ice begins to form (whichever comes first) the dredge and processing barge will be shut down and partial de-mobilization activities will commence. Before the dredge and processing barges are moved, the turbidity and suspended solids will be allowed settle out and the turbidity curtain and monitoring devices will be pulled from the water. The equipment will return to the staging area. During the winter, the dredges will be winterized, and all fuel will be removed from the equipment. Some equipment will be stored in the staging area/base camp on land for the winter, and the rest will be transported for dry storage in Nome.

5.13 Environmental Impact Summary

The BCPP is a small placer gold dredging operation that will operate seasonally within inland waters of Alaska. The project is well thought out and designed to have negligible long-term impacts on the environment. The deepening of the channel by mining may provide an environmental benefit. Alternatives for every aspect of the project have been considered on the basis of minimizing potential impacts to the environment. The alternatives chosen are the least likely to pose any substantive environmental risk. In summary the operation:

- Operates out of a self-contained mobile man camp
- Does not add chemicals to its process
- Operates at a low sound level and will not disturb birds or wildlife
- Is small in active footprint, thus does not pose much of a visual disturbance
- Will operate within its own containment, thus controlling turbidity before the 100 ft. mixing zone and will also provide a safety net for any accidental fuel spillages.
- The containment will also provide an effective fish barrier to protect fish from the dredging/filling operation.
- Will dredge sands and re-fill the holes it digs with the exception that it will leave a portion of the Bonanza Channel deeper than it is currently with the objective of improving fish passage and habitat in the estuary.

5.14 Reclamation Plan Summary

The BCPP is a dredge and fill mining operation. Reclamation will be concurrent with mining. Reclamation and time will restore the majority of the area impacted back to its pre-mining conditions. Reclamation is designed to improve the fish and shorebird habitat.

6.0 REFERENCES

Bray, R., Bates, A. D., & Land, J. M. (1996). *Dredging. A handbook for engineers.* Butterworth-Heinemann.

Brooks, A., Richardson, G. B., Collier, A. J., & Mendenhall, W. C. (1901). *A reconnainssance in the Cape Nome and adjacent goldfields of Seward Peninsula, Alaska, in 1900.* United States Geological Survey Special Publication. Washington Government Printing Office. Retrieved from http://dggs.alaska.gov/pubs/id?21021

Collier, A., Hess, F. L., & Smith, P. S. (1908). *The gold placers of parts of Seward Peninsula, Alaska, including the Nome, Coucil, Kougarok, Port Clarence, and Goodhope precincts.* Government.

Collier, A., Hess, F. L., Smith, P. S., & Brooks, A. H. (1908). The gold placers of parts of Seward Peninsula, Alaska including the Nome, Council, Kougarok, Port Clarence, and Goodhope Precincts. *U.S.G.S Bulletin 328*. Washington Government Printing Office.

Day, J., Christian, R. R., Boesch, D. M., Yáñez-Arancibia, A., Morris, A., Twilley, R. R., . . . Schaffner, L. (2008). Consequences of climate change on the ecogeomorphology of coastal wetlands: Estuaries and Coasts (3).

Green, R. (2019, September 3). Letter from Special Assistant to the Commissioner, ADF&G to J.P. Tangen.

Lacasse, S., Lambe, T., & Marr, W. A. (1977). *Sizing of containment areas for dredged material. U.S. Army engineer waterways experiment station, CE, Vicksburg, Miss., Technical Report D-77-21.*

Lin, T.-W. (1983). *Sedimentation and Self Weight Consolidation of Dredge Spoil.* Iowa State University, Department of Civil Engineering PhD Thesis.

Maertens, J., Van Alboom, G., Haelterman, K., & Couck, J. (2014). Stability of underwater slopes realized by means of a suction dredger. *Geotechniekvo*, 4.

NOAA. (2019). *Tides and currents*.

Pink, C. (2011). *Solomon area structural compiltion, Seward Peninsuls, Alaska.* Yukuskokon Professional Services, LLC for Millrock Resrources Inc.

Raaijmakers, T. (2005). *Submarine Slope Development of Dredged Trenches and Channels.* TU Delft and Hydronamic Delft.

Reed, J., & Meinert, L. D. (1986). Gold-bearing quartz vein mineralization at the Big Hurrah mine, Seward Peninsual, Alaska. *Economic Geology, V. 81*, 1760-1774.

Reine, K., & Dickerson, C. (2014). *Characterization of underwater sound produced by a hydraulic cutterhead dredge during navigation dredging in the Stockton Deep-Water Channel, California.* DOER Technical Notes Collection. ERDC TN-DOER-E38. Vicksburg, MS: U.S. Army Engineer Research and Development Center. Retrieved from www.wes.army.mil/el/dots/doer

Resources, N. (2007). *Unreported soil geochemistry data.*

Sciences, N. A. (1991). *Nome Sediment Test Reports. 7 August 1991.*

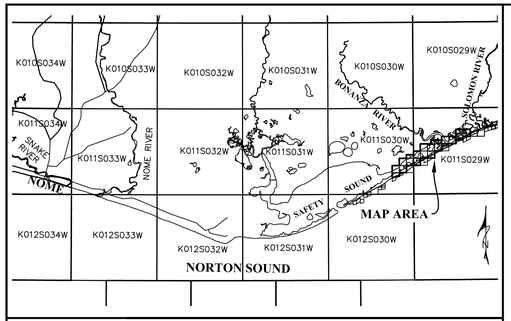
USACE. (2019). *Port of Nome Modification Feasibility Study, Nome, Alaska.*

Werdon, M., Szumigala, D. j., Newberry, R. J., Athey, J. E., & Hicks, S. A. (2005). *Major-oxide, minor-oxide, trace-element, geochemical, and non-carbonate carbon data from rocks collected in teh Solomon, Bendeleben, and Nome quadrangles, Seward Peninsula, Alaska in 2003 and 2004:ADGGS Raw Data File 2005-2.* State of Alaska. Retrieved from http://doi.org/10.14509/7130

Woodward-Clyde. (1998). *Nome Harbor Site Investigation Report, prepared for The City of Nome and the U.S. Army Corps of Engineers Alaska District. 19 January 1998.*

Plate 1

Land Ownership Map



AREA MAP

SOURCE: USGS QUADRANGLES, 1950

SCALE: 1"=5 MI.

0 5mi 10mi

GENERAL NOTES

1 CLAIM LINES AND HYDROGRAPHIC LINES WERE EXTRACTED FROM GIS DATA PROVIDED BY THE ALASKA DNR. THE MINING CLAIM BOUNDARY LINES, AS RETRIEVED FROM THE DNR DATABASE, ARE CLIPPED TO EXCLUDE THE APPROXIMATE LOCATIONS OF VALID EXISTING RIGHTS.

2 NO ASSERTION IS HEREBY BEING MADE REGARDING THE ACCURACY OR COMPLETENESS OF THE DEPICTION OF THESE CLAIMS WITH RESPECT TO THE LOCATION OR NATURE OF ANY VALID EXISTING RIGHTS EXCLUDED FROM THE CLAIMS.

3 THIS MAP IS NOT INTENDED TO ACCURATELY PORTRAY ANY LEGAL BOUNDARIES, EITHER SURVEYED OR PROTRACTED.

4 ALL POINTS SHOWN HEREON INDICATE THE APPROXIMATE LOCATIONS OF THE FEATURES WHICH THEY REPRESENT. THESE ARE NOT INTENDED TO BE A SUBSTITUTE FOR A SURVEY OF THESE FEATURES.

5 THE OWNERSHIP INFORMATION CONTAINED HEREON DOES NOT CONSTITUTE A LEGAL RECORD OF OWNERSHIP, BUT IS INCLUDED AS A GENERALIZED INDEX FOR INFORMATIONAL PURPOSES.

6 THE VALID AREA OF STATE MINING CLAIMS IS PRESUMED TO INCLUDE ONLY THOSE AREAS UNDER OWNERSHIP OF THE STATE OF ALASKA. ANY DEPICTION HEREON TO THE CONTRARY IS DUE TO MAPPING ERRORS, OR ERRORS IN – OR AVAILABILITY OF – THE DATA FROM WHICH THIS MAP WAS DEVELOPED.

7 OWNERSHIP OF SUBMERGED LANDS BENEATH NAVIGABLE WATERS IS BY THE STATE OF ALASKA. THIS MAP IS NOT INTENDED TO EITHER SUPPORT NOR DISPUTE THAT CLAIM WITH RESPECT TO THOSE WATERS DEPICTED HEREON.

8 THIS DRAWING DOES NOT CONSTITUTE A SUBDIVISION AS DEFINED BY AS 40.15.900

LEGEND:

- DIGITIZED MEAN HIGH WATER MEANDER LINES (OR OTHER HYDROGRAPHIC DELINEATIONS), UNSURVEYED
- MINING CLAIM EXTENTS PRIOR TO EXCLUSION OF VALID EXISTING RIGHTS
- MINING CLAIM EXTENTS AFTER EXCLUSION OF APPROXIMATE VALID EXISTING RIGHTS
- WATER SURFACE

OWNERSHIP

- FEDERAL (U.S. FISH & WILDLIFE SERVICE)
- STATE OF ALASKA
- SOLOMON NATIVE CORPORATION (SURFACE)
- PRIVATE (SEE OWNERHIP SCHEDULE)
- (#) PROPERTY OWNERSHIP IDENTIFIER
- ⊙ ### COORDINATE LOCATION IDENTIFIER

PROPERTY OWNERSHIP SCHEDULE

I.D.	DESCRIPTION	NAME
(1)	LOT 5 U.S.S. Nº 10251	HEIRS OF CARL TAKAK
(2)	LOT 4 U.S.S. Nº 10251	HERIS OF DARLENE BARBARA TRIGG
(3)	LOTS 1–10 TUCKER SUBDIVISION PLAT 2018–2	ERWIN TUCKER 68745 CALLE DENIA, CATHEDRAL CITY, CA 92234
(4)	LOT 6 U.S.S. Nº 10251	HEIRS OF MINNIE FAGERSTROM
(5)	LOT 1 U.S.S. Nº 10251	HEIRS OF SHIRLEY NICKALASKEY
(6)	LOT 2 U.S.S. Nº 10251	HEIRS OF MARGARET L. TRIGG
(7)	LOT 2 U.S.S. Nº 10251	HEIRS OF JEROME TRIGG, SR.
(8)	LOT 1A GARFIELD SUBDIVISION PLAT 95–3	MYRTLE ANN KOMAKHUK
(9)	LOT 1B GARFIELD SUBDIVISION PLAT 95–3	PETE LARSEN, JR. PO BOX 1603, NOME, AK 99762
(10)	LOT 2 U.S.S. Nº 10249	HEIRS OF ESTHER JAMES
(11)	LOT 3 U.S.S. Nº 10249	MYRTLE ANN KOMAKHUK

POINT TABLE

POINT #	LATITUDE	LONGITUDE
500	N64°29'53.28"	W164°37'38.69"
501	N64°30'00.05"	W164°37'45.95"
502	N64°30'06.98"	W164°37'25.44"
503	N64°30'12.58"	W164°37'08.23"
504	N64°30'03.19"	W164°36'57.65"
505	N64°30'09.77"	W164°36'28.28"
506	N64°30'22.05"	W164°36'42.40"
507	N64°30'24.10"	W164°36'00.45"
508	N64°30'36.76"	W164°35'21.58"
509	N64°30'40.56"	W164°35'00.65"
510	N64°30'30.87"	W164°34'49.11"
511	N64°30'52.66"	W164°34'15.72"
512	N64°30'44.06"	W164°34'05.99"
513	N64°30'55.98"	W164°33'53.52"
514	N64°30'50.37"	W164°33'47.67"
515	N64°31'05.23"	W164°33'10.02"
516	N64°31'00.77"	W164°33'10.53"
517	N64°31'17.63"	W164°32'34.31"
518	N64°31'20.91"	W164°32'05.69"
519	N64°31'16.15"	W164°32'05.62"

POINT #	LATITUDE	LONGITUDE
520	N64°31'24.43"	W164°31'29.82"
521	N64°31'31.63"	W164°31'30.51"
522	N64°31'38.86"	W164°31'07.48"
523	N64°31'41.52"	W164°30'39.05"
524	N64°31'35.64"	W164°30'39.17"
525	N64°31'47.17"	W164°30'12.15"
526	N64°31'41.59"	W164°30'12.28"
527	N64°31'59.88"	W164°29'23.37"
528	N64°32'03.99"	W164°29'28.10"
529	N64°32'04.08"	W164°29'10.47"
530	N64°32'02.04"	W164°29'08.01"
531	N64°32'04.29"	W164°29'07.61"
532	N64°32'02.81"	W164°29'05.78"
533	N64°32'03.22"	W164°29'04.50"
534	N64°32'04.45"	W164°29'06.10"
535	N64°32'03.35"	W164°29'04.67"
536	N64°32'05.20"	W164°28'59.06"
537	N64°32'05.07"	W164°28'54.64"
538	N64°32'04.64"	W164°28'53.91"
539	N64°32'02.20"	W164°29'04.00"

POINT #	LATITUDE	LONGITUDE
540	N64°32'10.18"	W164°28'01.33"
541	N64°32'16.18"	W164°28'01.35"
542	N64°32'23.38"	W164°27'31.20"
543	N64°32'28.22"	W164°27'01.03"
544	N64°32'33.32"	W164°26'37.59"
545	N64°32'37.82"	W164°26'17.04"
546	N64°32'41.30"	W164°26'01.03"
547	N64°32'43.73"	W164°26'00.70"

DETAIL "A"
1" = 200'

DETAIL "B"
1" = 200'

MEAN MAGNETIC DECLINATION 10° 11' E
(CALCULATED USING WMM2015 DATA)

GRAPHIC SCALE

1000 0 500 1000 2000 3000

U.S. SURVEY FEET

BONANZA CHANNEL PROPERTY

GENERAL PROPERTY OWNERSHIP MAP

A MAP OF OF PROPERTY OWNERHSHIP ADJACENT TO THE BONANZA CHANNEL, LOCATED IN TOWNSHIP 11S RANGE 29 WEST, AND TOWNSHIP 11 SOUTH, RANGE 30 WEST, KATEEL RIVER MERIDIAN, ALASKA

A MAP PRODUCED BY
NORTON SOUND SURVEYING, LLC
PO BOX 1126, NOME, AK 99762 907–360–3414

DATE: DECEMBER 05, 2018 SCALE: 1"=1000'

DEVELOPED FOR: **IPOP, LLC**

DRAFTING BY: ENIGMA INDUSTRIES

Designed	---	PAGE
Drawn	EAT	1 OF 1
Checked		

Exhibit 1

Travis/Peterson Environmental Consulting, Inc.

Travis/Peterson
Environmental Consulting, Inc.

Michael D. Travis P.E.
President

3305 Arctic Boulevard, Suite 102
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November, 29 2018
1610-02

National Marine Fisheries Service, Alaska Region
Post Office Box 21668
Juneau, Alaska 99802

Attention: **Jon Kurland**
Assistant Regional Administrator for Protected Resources

Dear Mr. Kurland:

The U.S. Army Corps of Engineers, Regulatory Division (USACE) has received and is reviewing a Department of the Army permit application from Mr. Beau Epstein, IPOP LLC to conduct exploratory coring under Nationwide Permit 6, and a test dredge operation, under Nationwide Permits 18 and 19 (USACE File# POA-2018-00123).

The USACE designated Mr. Michael Travis of Travis/Peterson Environmental Consulting, Inc. (TPECI) as the Non-Federal representative to conduct informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) for the proposed project (letter enclosed). We have determined that the proposed activity may affect, but is not likely to adversely affect the bearded seal (*Erignathus barbatus*), spotted seal (*Phoca largha*), and ringed seal (*Phoca hispida*). Our supporting analysis is provided below. We request your written concurrence if you agree with our determinations.

Project Description

The proposed exploratory project consists of two distinct activities. The first involves using a GeoProbe® coring rig to advance exploratory borings for soil sample collection and analysis. Coring will be conducted exclusively in the winter season. The second portion of the exploratory project involves using a small dual-engine, 6-inch diameter suction dredge to evaluate water quality impacts. Dredging will be conducted in the ice-free season. See enclosed equipment photo log for photos of the coring rig and dredge. Both parts of the exploratory project are described below.

Exploratory Coring

A 540MT GeoProbe® will be mounted on a sled pulled behind an all-terrain vehicle. The GeoProbe® uses a percussion hammer to advance probe cylinders into the ground. Core samples will be collected with a 2.25" diameter by 4-foot long sample tube and bagged for onsite logging and possible panning. Samples will then be selected for geochemical analysis and will include metallic screening, multi-element analysis, and free-gold assaying. IPOP intends to advance 13 borings throughout the project area to a maximum depth at 31 feet or refusal.

IPOP anticipates completing two to four borings per day and be finished within 14 days. However, inclement weather conditions could extend this period. The coring program will occur in the winter months.

Exploratory Dredging
A Keene® dual-engine, mini 6-inch dredge (Model #6211M263) will be used to perform the exploratory dredging. IPOP intends to use the mini dredge to dredge five locations within the project area. No more than five cubic yards of material will be removed from any single location. Therefore, total disturbed yardage is not to exceed 25 cubic yards.

Dredging will occur in two phases. The first phase focused on upper sedimentary layers (colloidal silt, clay) and the second phase focused on lower sedimentary layers (sand, gravel). During the dredging process, a powered skiff will trail the dredge within the tailing discharge zone to document surface water turbidity and transparency. Water turbidity and transparency documentation will occur in 100-foot intervals in a semi-circular grid centered on the discharge point. Water column transparency will be documented using a Secchi disc. Water turbidity will be determined at various depths using a Van Dorn-type sampler and handheld optical turbidity meter (Hach® 2100Q, Hanna Instruments® 93703 or similar). IPOP is anticipating a larger turbidity plume from the first phase and a smaller plume from the second and will adjust the grid accordingly.

IPOP anticipates completing exploratory dredging at all five locations within one month. However, inclement weather conditions could extend this period. The dredging program can only occur in open water. The project site is located at Sections 24 and 25, T11S, R30W Kateel River Meridian; 64.513275°N, 164.592773°W near Nome, Alaska.

Description of the Action Area
The action area is defined in the ESA regulations (50 CFR 402.02) as the area within which all direct and indirect effects of the project will occur. The action area is distinct from and larger than the project footprint because some elements of the project may affect listed species some distance from the project footprint. The action area, therefore, extends out to a point where no measurable effects from the project are expected to occur.

For the proposed project, the action area includes the project site located in the Bonanza Channel where the proposed exploratory coring and dredging activities will occur out to a determined in-water radial distance. For this project, the two exploratory activities will occur in opposing seasons and thus have action areas specific to each task. For example, the action area for coring is primarily influenced by the sound generated by the GeoProbe® percussion hammer. The action area also includes waters, which would be impacted by a turbidity plume generated by the dredge. The following paragraphs describe this determination.

Determination of Action Area for Coring
The action area during coring activities is defined as the area where marine mammals could be exposed to underwater noise at 120 decibels (dB) or louder according to the National Oceanic and Atmospheric Administration (NOAA) in-water acoustic threshold guidance (NOAA, 2016). According to GeoProbe®, the operating decibels of the 540MT through air at a frequency of 60 hertz is approximately 120 decibels (dB) at 1m and 80dB at 100m. Decibels cited for air are not equivalent to underwater decibels due to many

variables (i.e., temperature, salinity, density) but primarily because of a difference in reference pressures. However, studies of underwater noise conducted by NOAA's R/V Okeanos Explorer (Nieukirk, 2002) provide a rough conversion between the two decibel scales by adding 26dB when converting decibel levels from air to water. Using this basic conversion, IPOP estimates the GeoProbe® 540MT has an approximate underwater operating decibel level of 146dB at 1 meter and 106dB at 100m. Therefore, the action area radius for coring activities will be conservatively set at 100m. See enclosed Figure 1 for a map of the action area for coring activities.

IPOP also considered the dampening effects of coring within the lagoon. All thirteen soil borings will be advanced within the Bonanza Channel, which is insulated from the waters of Norton Sound by a barrier island. This is significant because underwater sound generated by the coring rig will be mostly confined to the lagoon as the proposed soil boring locations are 3-5 miles from Norton Sound via waters of Safety Sound and the mouth of the Solomon River. Despite this dampening effect, IPOP will maintain a 100m action area.

Coring will occur in the winter season when ice is present. The presence of ice in this area will limit the access of marine mammals into the lagoon since open water necessary for breathing will be either scarce or non-existent. However, ice seal research conducted between 2014-2017 by Alaska Department of Fish and Game (ADF&G) indicated a population of bearded and ringed seals was present in Norton Sound around Nome, Alaska during the winter months. Therefore, bearded and ringed seals are the most anticipated marine mammals to inhabit the project area during coring activities.

Determination of Action Area for Dredging
The Keene® suction dredge does not produce significant sound underwater. Thus, the action area for dredging is not determined by sound but rather by the estimated extent of the generated turbidity plume.

The first phase of the dredging process will involve fine sedimentary layers, while the second phase involves coarser sands and gravels. Therefore, the turbidity plume is expected to reach its maximum extant during the first phase of the dredging process. The purpose of the exploratory dredging process is to determine the extent of the turbidity plume; thus, the action area radius cannot be objectively determined. However, given the small size of the dredge (6-inch intake) and type of sedimentary material being dredged, IPOP does not believe the turbidity plume will exceed 150m (approx. 500ft). Therefore, the action area radius for dredging activities will be set at 150m. See enclosed Figure 2 for a map of the action area for dredging activities.

Dredging will occur in the summer season during a time of year where marine mammals may frequent the Bonanza Channel. The lagoon was surveyed in 2018 and had an average depth of 4-6 feet. Thus, due to their size, whales and porpoises are not anticipated. However, bearded, spotted, and ringed seals have the physiology to access these waters and are therefore the most anticipated marine mammals to inhabit these waters during dredging.

NMFS Listed Species and Critical Habitat in the Action Area

The bearded seal (*Erignathus barbatus*), spotted seal (*Phoca largha*), and ringed seal (*Phoca hispida*) were the only Marine Mammal Protection Act (MMPA)-protected species expected to occur within the action area. The following paragraphs discuss this determination and are organized by species and by the seasons that exploratory activities will occur.

Winter Season - Coring

Exploratory coring will only occur in the winter season when the ice allows rig access to the 13 proposed boring locations. Outside of the bearded seal and ringed seal, no other MMPA-protected species are expected to occur within the 100m winter action area.

Bearded Seal

On December 28, 2012, NMFS listed the bearded seal Beringia distinct population segment (DPS) as threatened under the ESA (77 FR 76740) and depleted under the MMPA. This DPS is the only bearded seal common to Alaska and is thus considered Alaska stock. The ESA listing is a point of contention and has been contested by the Alaska Oil & Gas Association (14-35806,14-35811), but ultimately upheld by the U.S. Court of Appeals for the Ninth Circuit and the U.S. Supreme Court (17-133, 17-118). As such, the bearded seal Beringia DPS remains a threatened species under the ESA. Critical habitat has not been proposed for the bearded seal Beringia DPS.

Given their widespread habitat range, the bearded seal has the potential to be present at the project site. In the winter, bearded seals tend to concentrate around their preferred ice habitat at the ice edge, which allows for hauling out between foraging trips (https://www.fisheries.noaa.gov/species/bearded-seal). The 2014-2017 ADF&G ice seal research confirmed bearded seal presence in the area during winter. However, the probability of encountering a bearded seal within the project area during the estimated 14-day coring timeline is low due to lack of open water within the lagoon during winter. Mitigation measures are discussed in the following section.

Ringed Seal

Like the bearded seal, on December 28, 2012, NMFS listed the Arctic subspecies (the Alaska stock) of the ringed seal as threatened under the ESA (77 FR 76706) and depleted under the MMPA. The listing is also a point of contention for the same reasons as the bearded seal and has likewise been contested in similar cases. However, the ringed seal Arctic subspecies remains a threatened species under the ESA. Critical habitat for the Arctic subspecies of the ringed seal has been proposed and is currently being evaluated. The proposed critical habitat for the Arctic subspecies of ringed seal encompasses much of the Beaufort Sea, Chukchi Sea, and northern Bering Sea, including all of Norton Sound.

Unlike the bearded seal, the ringed seal can occupy areas with 100% ice cover due to their ability to create and maintain their own breathing holes. They also make snow caves (lairs) in snowdrifts that form around the breathing holes. The pups are typically birthed, reared, and weaned in the lairs before the ice melts in the spring (https://www.fisheries.noaa.gov/species/ringed-seal). The 2014-2017 ADF&G ice seal research confirmed ringed seal presence in the area during winter. The probability of encountering a ringed seal within the project area during the 14-day coring timeline is moderate. Mitigation measures are discussed in the following section.

Open Water Season – Dredging

Exploratory dredging will only occur in the open water season when no ice is present at the 5 proposed dredging locations. Outside of the bearded seal and spotted seal, no other MMPA-protected species are expected to occur within the 150m summer action area.

Bearded Seal

Most adult bearded seals migrate north during the summer months to utilize the fragmented ice edge for pup rearing and foraging. The 2014-2017 ADF&G ice seal research showed that migration occurred alongside the sea ice retreat in late-May/early-June months. However, juvenile bearded seals are known to remain near the coast, often in bays, estuaries, and river mouths (https://www.fisheries.noaa.gov/species/bearded-seal). As such, the probability of encountering juvenile bearded seals within the project area during the estimated one-month dredging timeline is high. Mitigation measures are discussed in the following section.

Spotted Seal

Unlike the bearded seal and ringed seal, spotted seals are not ESA-listed and are not listed as depleted under the MMPA. Critical habitat is not considered necessary for the spotted seal.

The spotted seal Bering DPS is the only spotted seal common to Alaska is thus considered Alaska stock. Seals overwinter in the Bering Sea near the sea ice edge and resort to hauling-out in coastal areas throughout the summer. During this time they are primarily foraging (https://www.fisheries.noaa.gov/species/spotted-seal). The probability of encountering spotted seals within the project area during the estimated one-month dredging timeline is high. Mitigation measures are discussed in the following section.

Mitigation Measures

IPOP proposes that the following mitigation measures are implemented to minimize risk to marine mammals within the calculated action area. These basic measures would apply to the proposed coring and dredging activities:

1. Coring and dredging activities will not be initiated until the action area is thoroughly inspected for marine mammal activity by the project manager.

2. A shut-down zone of 100m radius centered around coring activities and 150m radius for dredging activities will be established. All activities will halt if a marine mammal enters the shut-down zone. Activities will resume once the animal has exited the shut-down zone on its own accord.

3. The project manager will continuously monitor the action area throughout coring and dredging activities. This will include scanning the area with binoculars and a range finder.

4. The project manager will maintain an in-depth log book noting the time and date of exploratory activities, environmental conditions (e.g., sea state, weather, visibility (km/mi), lighting conditions and percent ice cover), beginning and end times for all shut-down events, marine mammal species observed, number of marine mammals observed, and marine mammal behaviors (e.g. foraging, hauling-out), and any other miscellaneous observations. Copies of the log book will be provided to the NMFS Protected Resources Division after the exploratory program is completed.

Effects of the Action

There are two potential marine mammal stressors that may result from the exploratory coring and dredging activities. No critical habitat will be affected by the action.

The first stressor involves acoustical disturbance from coring. The coring process is expected to produce underwater noise at 120 dB out to 100m from the coring rig. As mentioned in the previous section, all activities will halt if a marine mammal enters the established 100m shut-down zone. Therefore, IPOP does not anticipate that this project will expose bearded seals or ringed seals to noise levels above 120 dB. However, acoustical noise generated by the coring process will extend beyond this zone and may alter the behavior of marine mammals (e.g., attraction/aGeovoidance of the area). The short duration of coring activities (est. 2-4 borings per day) combined with restricted access to the boring locations due to the presence of thick ice in a shallow channel make it unlikely that any individual seals will encounter acoustic noise generated by the project. IPOP therefore considers any acoustic disturbance from coring to be insignificant or extremely unlikely to occur.

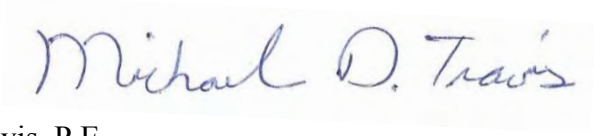
The second stressor involves temporary habitat alteration from the turbidity plume generated during exploratory dredging. The generation of the turbidity plume may temporarily alter movement of fish species that the bearded seal and spotted seal forage. However, the turbidity plume generated during the exploratory dredging process will eventually settle out with little to no significant repercussions to fish habitat. Additionally, moments of high turbidity in the waters of Bonanza Channel is a natural occurrence during storm events. Therefore, IPOP considers any temporary habitat alteration generated from the turbidity plume during dredging activities to be insignificant and discountable.

Conclusions

Based on the analysis that all effects of the proposed project will be insignificant, extremely unlikely, or discountable, IPOP has determined that the proposed project is not likely to adversely affect any listed species or critical habitat under NMFS's jurisdiction. We have used sound logic and the best scientific and commercial data available to complete this analysis. We request your concurrence with this determination.

Please contact me via email at mtravis@tpeci.com, by mail at the address above, or by phone at (907) 522-4337 if you have any questions or concerns.

Sincerely,



Michael Travis, P.E.
Principal

Enclosures: Non-Federal Representative Authorization Letter
Equipment Photo Log
Figure 1 – Coring Action Area Map
Figure 2 – Dredging Action Area Map

CC: Beau Epstein, IPOP LLC
Leslie Tose, United States Army Corps of Engineers: Alaska District

Literature Cited

Alaska Department of Fish and Game (ADF&G), 2017: "2014-2017 Ice Seal Research: Movements and Habitat Use Studies", Accessed on 11/21/2018 via: http://www.adfg.alaska.gov/index.cfm?adfg=marinemammalprogram.icesealmovements

National Oceanic and Atmospheric Administration (NOAA), 2016: "Technical Guidance for Assessing the Effects of Anthropogenic Noise on Marine Mammal Hearing", Accessed on 11/19/2018 via: https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/threshold_guidance.html

Nieukirk, S., NOAA: Pacific Marine Environmental Laboratory, 2002: " Understanding Ocean Acoustics", Accessed on 11/21/2018 via: https://oceanexplorer.noaa.gov/explorations/sound01/background/acoustics/acoustics.html

Stafford, K., The Pew Charitable Trusts: U.S. Arctic Program, 2013: "Anthropogenic Sound and Marine Mammals in the Arctic: Increases in Man-Made Noises Pose New Challenges", Accessed on 11/14/2018.

Exhibit 2

Eelgrass Study

EXHIBIT 2: Eelgrass Survey

IPOP and reviewed and applied the Corps document "Components of a Complete Eelgrass Report Guidelines" (May 27, 2016) provided by the Corps to the extent of conducting a Tier 1 survey, because IPOP has at all relevant times proposed to avoid any work in eelgrass (*Zostera marina*). All survey activities were done at the end of the summer, at the time of maximal growth.

Inasmuch as the Corps guidance reports that survey results are only valid for a period of one year, the critical question for summer 2020 operations is whether or not eelgrass is present in the areas IPOP proposes to mine during that summer as set forth in the Plan of Operations. Fortunately, the drone footage leaves no doubt that these areas have minimal to no vegetation, being extremely shallow. The detailed drone footage of the actual areas to be worked, given the extreme shallows, should give the Corps the confidence of a Tier 2 survey.

Survey Activities

All survey work was conducted by three individuals trained in the identification of *Zostera marina*, a surveyor, Eric Tweet, and two helpers, Ben Arata and Tyler Green. Survey activities initially focused on documenting the presence of eelgrass, *Z. marina*, with a survey conducted on September 25, 2018 with Eric Tweet and Ben Arata. The only *Z. marina* found was floating samples which IPOP believes drifted in from Safety Sound. The Corps has received and reviewed the survey and rejected as inadequate, so IPOP determined to conduct a renewed survey in 2019 using both individuals in boats and comprehensive drone-based footage.

IPOP engaged the firm of Oregon Aerial Solutions, and extensive experiments were conducted with known eelgrass beds in Safety Sound, and a special spectral camera used on drones to assess land-based agricultural activities. This work was conducted from August 14-17, 2018, and from August 28 through September 2, 2019, but the underwater nature of the eelgrass interfered with effective efforts to use a spectral signature to identify the presence of eelgrass.

However, an extensive boat and drone-based survey of *Z. marina* in the eastern portion of Safety Sound did succeed in identifying the nearest patch to the mouth of the Bonanza Channel, which is reflected in this drone photo with the GPS coordinates (64.49794, -164.69353):

IPOP notes that this point is 1.5 miles from the opening of the channel and about three miles from DSKN 30-32. IPOP also utilized an underwater video camera to capture and review the specific appearance of beds of *Z. marina*:

IPOP notes that dense eelgrass beds of appreciable significance to local fish populations in Safety Sound are easily visible even from high level aerial photographs of Safety sound:

IPOP's surveyors found the highest density of eelgrass in the darkened area visible in photo. No such areas appear anywhere within IPOP's thirty-two claims.

As noted in the guidance, aerial photography may be used to determine eelgrass locations for very large sites. With the failure of the drone-based spectral identification method, IPOP commissioned extensive drone-based 4K resolution surveys of all thirty-two claims. Photographs comprising the

western side of the claim block were collected from September 16-21, 2019. During this process, a boat crew followed along near the drone areas, conducting a physical survey.

IPOP's surveyors report that the only vegetation with the appearance of seagrass identified on the claims, and particularly in DSKN 30-32, is a species with much narrower and rounder leaves or stems than *Zostera marina*, believed to be *Phyllospadix scouleri*, though this species is more common in the Alaska panhandle.

The species is present throughout DKSN 30-32 (and elsewhere on the IPOP claims), and is the principal species present, with the second most numerous vegetation being the green moss that is attached to this species, believed to be *Rosenvingiella polyrhiza*. *Ruppia maritima* may also be present. IPOP's surveyors obtained underwater video footage of the two species in multiple locations. This still is taken from a video taken in the shallow channel NNE of the island at the west end of DKSN 30:

The white color is to some extent an artifact of the camera, and the unknown species, and other algae colonizing it, are in fact green. The water is approximately three feet deep in this area.

The DroneDeploy firm was engaged to utilize AI-powered drone data processing to stitch together the tens of thousands individual photographs taken into a single view that may be accessed and viewed much like Google earth.

Here is the 4K drone footage of the portion of the channel where the above underwater photograph was taken, and one can see it is easy to distinguish the beds of the unknown species from the shallower portions where less vegetation is present:

The *P. scouleri* is growing in very thick clumps in the deeper portions of Bonanza Channel. In the latter part of October, IPOP's surveyors removed and photographed one dead clump to show the density:

IPOP speculates that this species may form a significant obstacle to returning adult salmon and other fish in the channel portions of the Bonanza Channel.[1]

Given the total absence of *Z. marina*, and the general absence of high quality habitat, IPOP believes that while further survey work is being completed, the appropriate regulatory response is to use the available drone footage of DSKN 30-32 to concur that mining operations for the summer of 2020 will not cause any adverse effect on essential fish habitat.

The shallow areas appear lighter and are nearly devoid of underwater vegetation, as seen in this closeup of the NE end of the shoal:

[1] IPOP notes that a recent article in the *Anchorage Daily News* shows dead pink salmon in the Shaktoolik River entangled in vegetation strikingly similar to that present in the Bonanza Channel. *See* https://www.adn.com/alaska-news/rural-alaska/2019/07/12/warmer-waters-investigated-as-cause-of-pink-salmon-die-off-in-norton-sound-region/. It is conceivable that the vegetation is in fact an invasive species.

In addition to being nearly devoid of vegetation, the area is extremely shallow and provides no cover for aquatic animals from bird predation.

The drone footage also permits IPOP to assess the path from the camp site to the area identified for summer 2020 operations.

These still pictures do not do justice to the full scale of detail that is visible from the drone footage. The following hyperlink will permit agency access to the stitched-together drone photos, from which closer views can be obtained throughout DSKN 30-32 and the path to the base camp:

https://www.dronedeploy.com/app2/data/5d88f96ae2922d5d6a4afc1e;jwt_token=eyJhbGciOiJIUzUxMiIsInR5cCI6IkpXVCJ9.eyJvdmVybGF5X2ZvbGRlcl9pZCI6IjVkODQ1ODM5Mzg4NWNlMzAzODgyOGE5ZCIsInNjb3BlIjpbIjY2YWZiNmQ0ODBfQkE1NjNBODg3eN09QRU5QSVBFTElORSJdLCJ0eXBlIjoiUmVhZE9ubHlQbGFuIiwiaWQiOiI1ZDg4Zjk2YWUyOTIyZDVkNmE0YWZjMWUiLCJleHAiOjI1MzQwMjMwMDc5OX0.1KSItmwzzTP2rTQiXVRhMbrBYpz3XOPm5TQVhHSjRg_sTPOkskk46V7fllDx2Z5MZDuaZVspqk-yqsVZZGkhLw

IPOP requests that the agencies not use any features to make changes in the database, and requests that the confidentiality of this hyperlink be maintained, as the data within it was assembled at considerable cost and could be damaged by users of the hyperlink.

IPOP believes that its investment in this high-quality footage will permit the agency to confirm minimal adverse impact from proposed operations, and IPOP proposes to conduct further biological examination of the deeper areas of with more vegetative cover during the summer of 2020.

Exhibit 3

Essential Fish Habitat Draft Assessment

DRAFT ESSENTIAL FISH HABITAT ASSESSMENT FOR TEN IPOP, LLC. PLACER MINING CLAIMS NEAR SOLOMON, ALASKA

Prepared for:

IPOP, LLC.
9811 W. Charleston Blvd, #2-444
Las Vegas, NV 89117

Prepared by:

Travis/Peterson Environmental Consulting, Inc.

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April 2018

1610-01

TABLE OF CONTENTS

1.0 INTRODUCTION

This report is a draft assessment of the Essential Fish Habitat (EFH) that overlaps ten IPOP, LLC. (IPOP) placer mining claims near Solomon, Alaska (Figure 1, Appendix A). IPOP intends to suction dredge sediments for gold within these claims. The claims are located within coastal lagoons. IPOP contracted Travis/Peterson Environmental Consulting, Inc. (TPECI) to conduct an EFH draft assessment to identify and determine whether suction dredge mining will adversely impact designated EFH.

Enacted in 1976, the Magnuson-Stevens Fishery and Conservation and Management Act (Magnuson-Stevens Act) governs the United States fisheries management. In 1996, Congress amended the Magnuson-Stevens Act to include sustainable fisheries management procedures and defined EFH as *"those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity"* and is only applicable to species managed under a federal Fishery Management Plan. EFH are reviewed and updated every five years with the 2015-17 EFH being the most recent review. Section 305(b) of the Magnuson-Stevens Act states that federal agencies must consult with the National Marine Fisheries Service (NMFS) if an EFH assessment determines that proposed activities may have an adverse effect on EFH. An adverse effect is essentially any impact that decreases the quality of EFH, specifically "*direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions*", as stated in the Magnuson-Stevens Act.

TPECI did not find that the proposed mining activities for the ten IPOP mining claims would adversely affect EFH. Therefore, TPECI does not believe consultation with the NMFS is required. This assessment discusses the reasoning behind this conclusion in the following format: (1) a project description, (2) a summary of EFH in the project area, and (3) an analysis of the effects on EFH.

1.1 PROJECT LOCATION

IPOP currently holds thirty-two State of Alaska mining claims in Alaska State Waters near Solomon, Alaska on the Seward Peninsula. The current mining operation will attempt to recover gold within ten of the thirty-two mining claims. Below are the ten mining claims, totaling 880 acres, where proposed mining activities are proposed to occur. Consult Figure 2 in Appendix A for a map showing each mining claim location.

1. DKSN 15 – 160 acres
2. DKSN 16 – 160 acres
3. DKSN 17 – 40 acres
4. DKSN 18 – 40 acres
5. DKSN 21 – 40 acres
6. DKSN 22 – 40 acres
7. DKSN 23 – 40 acres
8. DKSN 26 – 40 acres
9. DKSN 31 – 160 acres
10. DKSN 32 – 160 acres

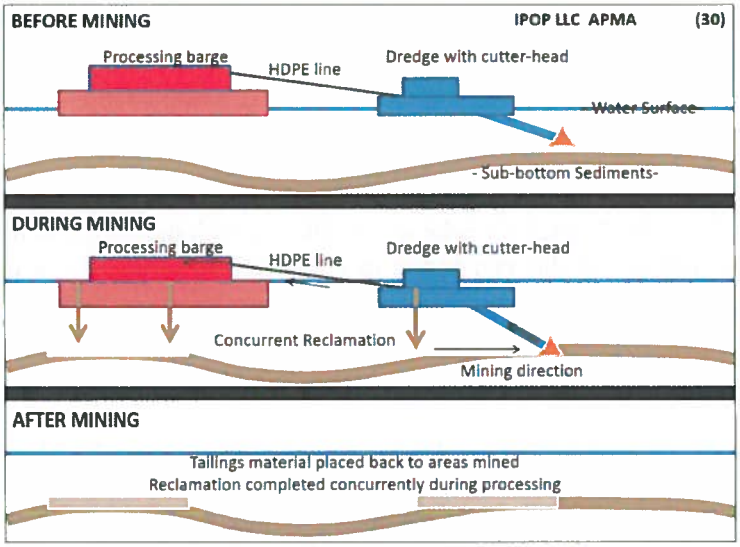
Claims DKSN 15-26 are located in a shallow coastal lagoon approximately 1.5 miles east-northeast of the Solomon River mouth. Claims DKSN 31 and DKSN 32 are located in Bonanza Channel approximately 2.75 miles southwest of the Bonanza River intersection with the Bonanza Channel.

Surrounding landscape is comprised of relatively flat coastal wetlands, grassland, and tidal mudflats. Freshwater hydrology is primarily influenced by the Solomon River and Bonanza River. Smaller freshwater inputs include Pine Creek and Secret Creek. Other nearby freshwater rivers include the Eldorado and Flambeau River systems, which contribute to the waters of Safety Sound. Marine hydrology is solely comprised of the waters from Norton Sound.

1.2 PROJECT DESCRIPTION

The IPOP placer mining operation is comprised of a single-engine, 10-inch diameter intake, suction dredge (20-feet x 73-feet) and processing barge (40-feet x 70-feet). The suction dredge will excavate sediment to a maximum depth of 31 feet below water level. Excavated material will run through a box and screen shaker before the finer material is processed by centrifuges. The excavated area created by the suction dredge will be filled by the trailing processing barge and will be concurrent with the mining process. This will be accomplished using depth sonar and GPS location mapping to distinguish disturbed benthic soils from non-disturbed areas, which will leave the bottom as close to where it was originally dredged. IPOP intends to mine claims at a rate of 100-acres (approximately 484,000 cubic yards) per year.

IPOP has completed the *Application for Permits to Mine in Alaska* (APMA) with the Alaska Department of Natural Resources. The APMA contained detailed descriptions of the proposed mining operation. See the drawing below for a graphic representation of the proposed mining process.



Drawing 1 *The suction dredge pulls material from the bottom of the lagoon and pushes it to the processing barge. The processing barge separates the material using box and screen shakers and centrifuges to access gold. Tailings are deposited from the processing barge into the original dredged area during the mining process. Drawing was created by Alaska Earth Sciences and was included in the APMA as a cross-section sketch.*

To operate, the dredge also requires a discharge permit from the Alaska Department of Environmental Conservation (ADEC). The 2015 *Medium-Size Suction Dredge General Permit (AKG371000)* outlines best management practices for medium-size suction dredge operations and authorizes discharges to fresh waters of the United States (18 AAC 83.990(77)). The permit also allows exceedance of Alaska Water Quality Standards for turbidity within mixing zones up to 500-feet from the discharge point.

2.0 ESSENTIAL FISH HABITAT

TPECI used the NMFS EFH Interactive Mapping Tool to identify EFH in and around the ten IPOP mining claim locations. Five species of salmon (Oncorhynchus family: Chum – *Oncorhynchus keta*, Pink – *Oncorhynchus gorbuscha*, Coho – *Oncorhynchus kisutch*, Sockeye – *Oncorhynchus nerka*, and Chinook –

Oncorhynchus tshawytscha) have EFH at this location. Saffron cod (*Eleginus gracilis*) are also present at this location, but do not have designated EFH in the area. The Red King Crab (*Paralithodes camtschaticus*) EFH is located several miles off the Seward Peninsula coastline, but red king crab are not present in the lagoons where the mining claims are located. No designated Habitat Areas of Particular Concern were identified in this area. TPECI has shared these findings with NMFS Supervisory Fisheries Biologist, Mr. Matthew Eagleton.

The following subsections discuss the EFHs of concern listed above.

2.1 PACIFIC SALMON EFH

The EFHs for five-species of Pacific salmon overlap with all ten IPOP mining claims. See Appendix B for a map showing the EFH for each species of salmon. Of these, Chum and Coho salmon are fished commercially using set gillnets. The Division of Commercial Fisheries of Alaska Department of Fish & Game (ADF&G) manages commercial and subsistence fisheries. According to ADF&G Norton Sound Commercial Fisheries Management Biologist, Jim Menard, there were six permit holders in the Nome Subdistrict 1 (333-10) in 2017.

Historically, commercial fishing has mostly focused on Chum salmon; however there has been recent market interest in Pink salmon. The Nome Subdistrict 1 commercial salmon fishery has a rocky past. In 1984, salmon management shifted focus from commercial to subsistence. This shift resulted in a significant reduction in sport fishing bag limits and a reduction in commercial harvest areas as well as commercial fishing time. Throughout the 1980s-early 2000s, the commercial salmon fishery was nearly eliminated due to low productivity. In 2003, the Alaska Board of Fisheries (board) designated the Chum salmon stock in this subdistrict as a management concern. An Action Plan was created in December 2003 (Menard-Bergstrom, 2003), which outlined steps to reduce chum salmon fishing mortality to meet spawning escapement goals to allow for subsistence harvest. In 2015, the board discontinued the Nome Subdistrict chum salmon stock as a management concern because the majority of escapement goals had been met (Menard-Bergstrom, 2015). The Chum salmon runs of 2013-2015 were some of the highest on record with the largest runs occurring in the Eldorado River.

2.1.1 Pacific Salmon Impact Analysis

TPECI and IPOP recognize agency and local concerns with the proposed suction dredge mining of these claims. Suction dredging by nature causes a localized increase in turbidity within the water column and disturbs benthic soils. Such activities can disturb salmon migration patterns and impede access to anadromous rivers. However, TPECI believes the ten mining claims under consideration can be successfully mined without significant adverse effects to Pacific salmon EFHs.

The IPOP dredge is classified by the ADEC as a "medium-size" suction dredge due to its 10-inch diameter intake. As previously mentioned, the ADEC general permit for medium-size suction dredge operation in marine waters restricts the turbidity mixing zone to a maximum of 500-feet from the dredge. All mining operations must halt if the turbidity exceeds State thresholds. Mining operations may resume when the plume settles. These restrictions are important because at no single location within any of the ten IPOP mining claims could a 500-foot turbidity mixing zone impede pacific salmon from reaching the Bonanza or Solomon River. See Figures 3 and 4 in Appendix A for maps showing permitted mixing zones for each mining claim.

Mr. Menard informed TPECI that most salmon access the Bonanza River from the direction of the Bonanza Bridge and to a lesser extent from Safety Sound. Mining claim DKSN 31 and 32 are in the Bonanza Channel between Safety Sound and the Bonanza River. Therefore, turbidity plums generated by mining activities in this area will not block salmon passage to the Bonanza River and not cause adverse effects to Pacific salmon EFHs.

The remaining eight claims (DKSN 15-26) are in a lagoon fed by Pine Creek and Secret Creek. TPECI used the ADF&G Anadromous Waters Catalog Interactive Mapper to determine that neither creek is classified as anadromous. Therefore, mining activities in this area will not impeded salmon passage or cause adverse effects to Pacific salmon EFHs.

3.1 SAFFRON COD EFH

Saffron cod is not commercially fished in this area; however, it is a popular subsistence fish harvested from the Bonanza Bridge and Bonanza Channel in the fall (September/October) and through the ice. The species is managed under the Arctic Management Area, which encompasses waters of the Chukchi Sea and Beaufort Sea, but does not extend south of the Bering Strait (NPFMC, 2009). The EFH for Saffron cod does not include Norton Sound (Appendix B).

3.1.1 Saffron Cod Impact Analysis

The Saffron cod EFH does not overlap with any IPOP mining claims; therefore, mining activities in this area would not have an adverse impact on EFH. However, TPECI and IPOP recognize there is local concern with the proposed suction dredge mining of these claims, specifically the claims located in the Bonanza Channel (DKSN 31 and DKSN32). However, TPECI believes mining activities at DKSN 31 and DKSN 32 will not affect Saffron cod because the claims are located several miles from the primary subsistence fishing areas in the vicinity of the Bonanza Bridge and mouth of the Bonanza River.

4.1 RED KING CRAB EFH

The Red King Crab EFH does not overlap with any IPOP mining claims. Therefore, mining activities in this area would not have an adverse impact on EFH. The EFH for red king crab is in Norton Sound (Appendix B). TPECI and IPOP recognize there is significant regional concern with the red king crab stock.

4.1.1 Red King Crab Impact Analysis

TPECI and IPOP understand the proximity of the Red King Crab EFH to the mining claims. However, TPECI does not believe mining activity at any of the IPOP claims could have an adverse effect on the Red King Crab EFH because of its significant distance from the area.

5.0 CONCLUSIONS

TPECI has reviewed EFH literature in this area and does not believe suction dredging the ten IPOP mining claims will adversely affect EFH in this area. Mitigation is therefore not applicable.

Five species of salmon have EFH that overlap with the mining claims. However, the ADEC turbidity mixing zone restrictions prevent turbidity plumes generated by placer mining to exceed 500-feet. At no single point

within any of the ten IPOP mining claims could a 500-foot turbidity plume obstruct salmon passage to the Bonanza and Solomon Rivers. Saffron cod does not have EFH in the area. However, it is a popular fish that is locally fished from the Bonanza Channel and Bonanza Bridge in the fall. Mining activities in the Bonanza Channel will be several miles from the subsistence area. The Red King Crab EFH is located several miles offshore in the Norton Sound, but does not overlap with any of the IPOP mining claims.

6.0 REFERENCES

ADEC, Alaska Department of Environmental Conservation, *Authorization to Discharge Under the Alaska Pollutant Discharge Elimination System for Medium-Size Suction Dredge Placer Miners: General Permit Number AKG371000*, Effective: February 1, 2016, Expires: January 31, 2021.

ADF&G, Alaska Department of Fish & Game, Anadromous Waters Interactive Mapper, http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc, accessed April 5-10, 2018.

Menard, J., D. J. Bergstrom. *2003 Norton Sound Nome Subdistrict Chum Salmon Stock Status and Action Plan: a report to the Alaska Board of Fisheries*. Alaska Department of Fish and Game, Regional Information Report No. 3A03-35, Anchorage.

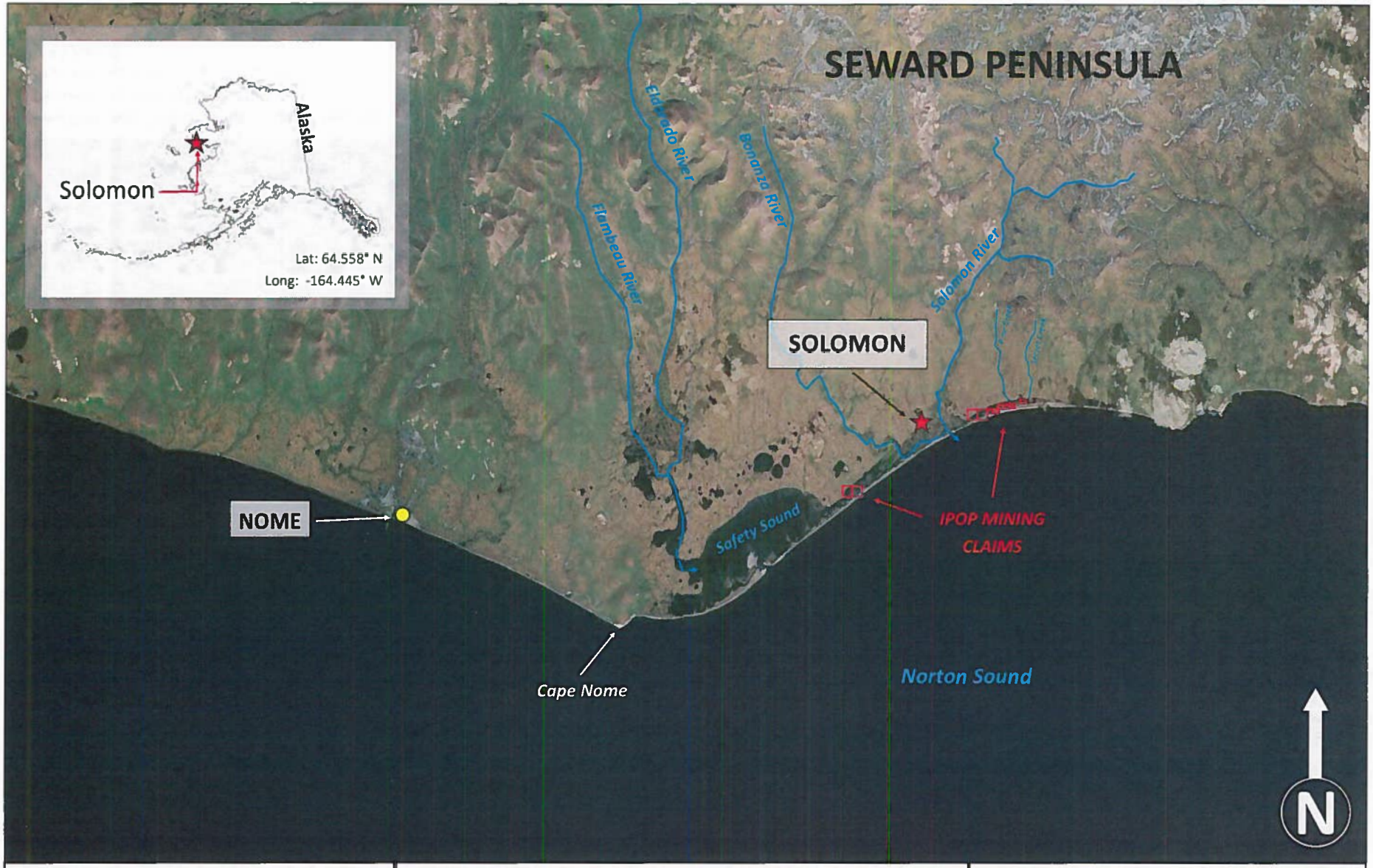
Menard, J., D. J. Bergstrom. *2015. Norton Sound Subdistricts 1-3 chum salmon stock status and action plan, 2016; a report to the Alaska Board of Fisheries.* Alaska Department of Fish and Game, Special Publication No. 15-18, Anchorage.

NMFS, National Marine Fisheries Service, Essential Fish Habitat Interactive Mapping Tool, https://www.habitat.noaa.gov/protection/efh/efhmapper/index.html, accessed April 5-10, 2018.

NPFMC, North Pacific Fishery Management Council, *2009 Fishery Management Plan for Fish Resources of the Arctic Management Area*, August 2009.

APPENDIX A

Figures



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	Solomon, Alaska	Figure 1 - Vicinity Map	
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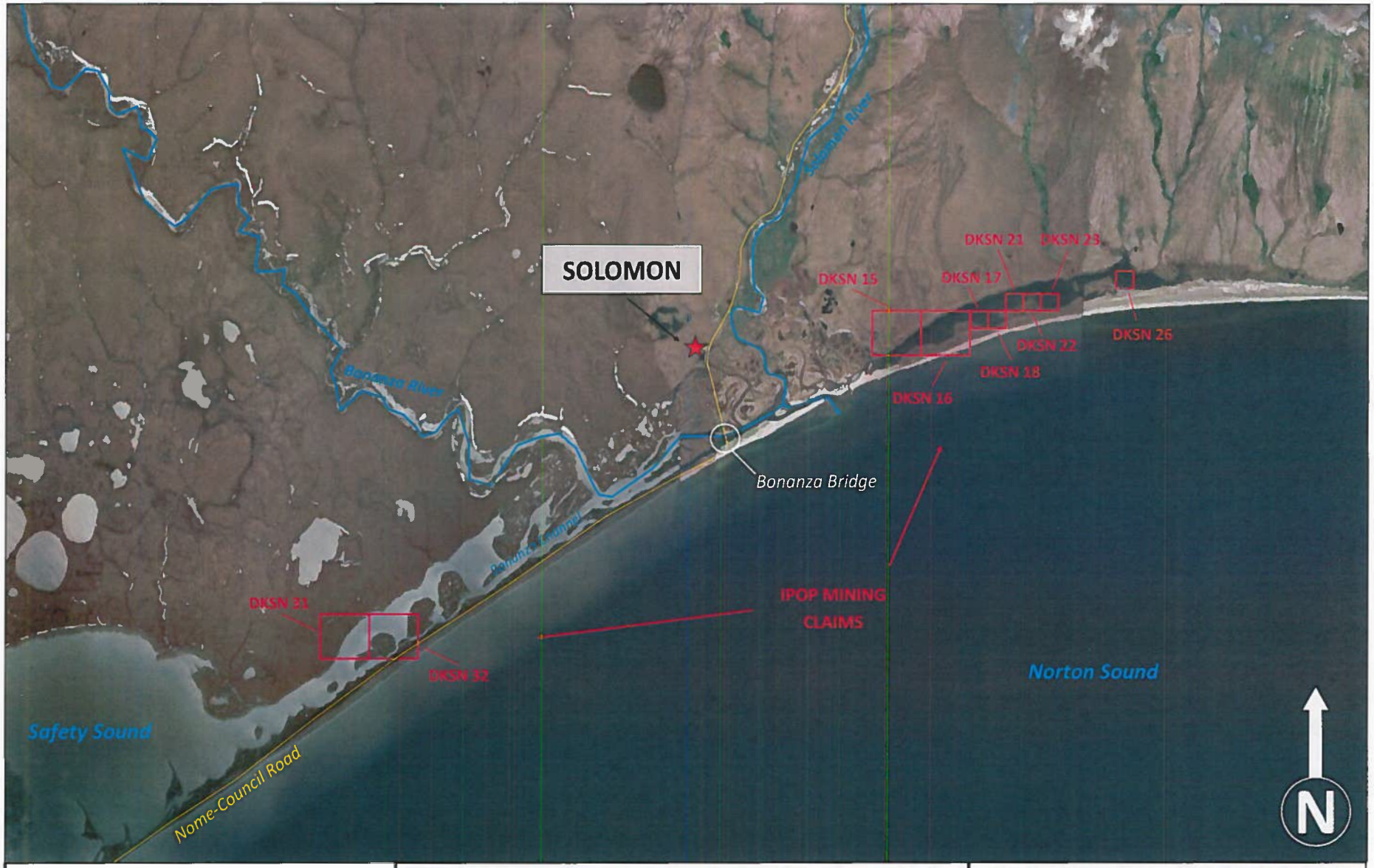
DNR-A-005389



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	Solomon, Alaska	Figure 2 - IPOP Mining Claims Map

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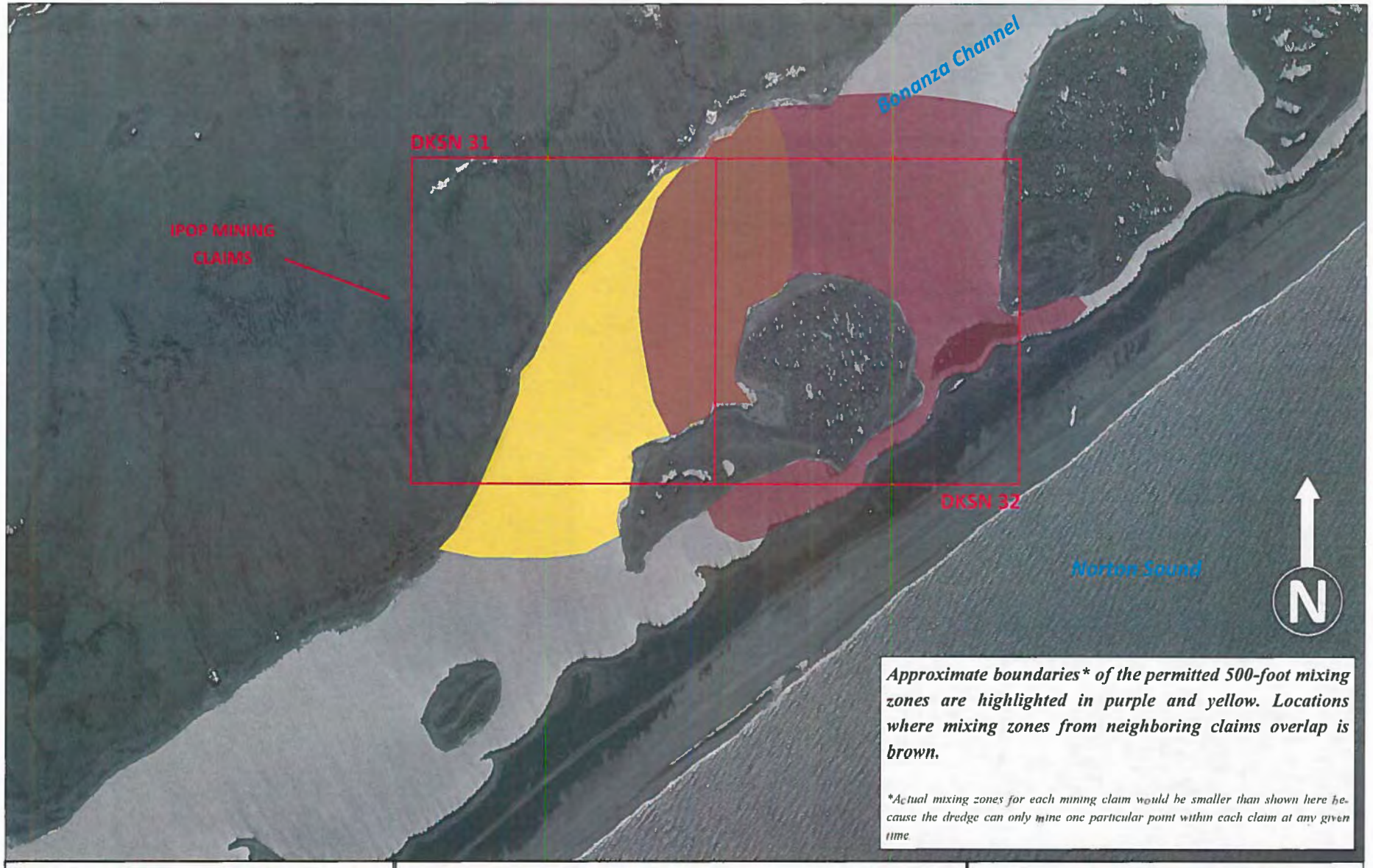

Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	Solomon, Alaska	Figure 3 - Mixing Zone Map for DKSN 31-32

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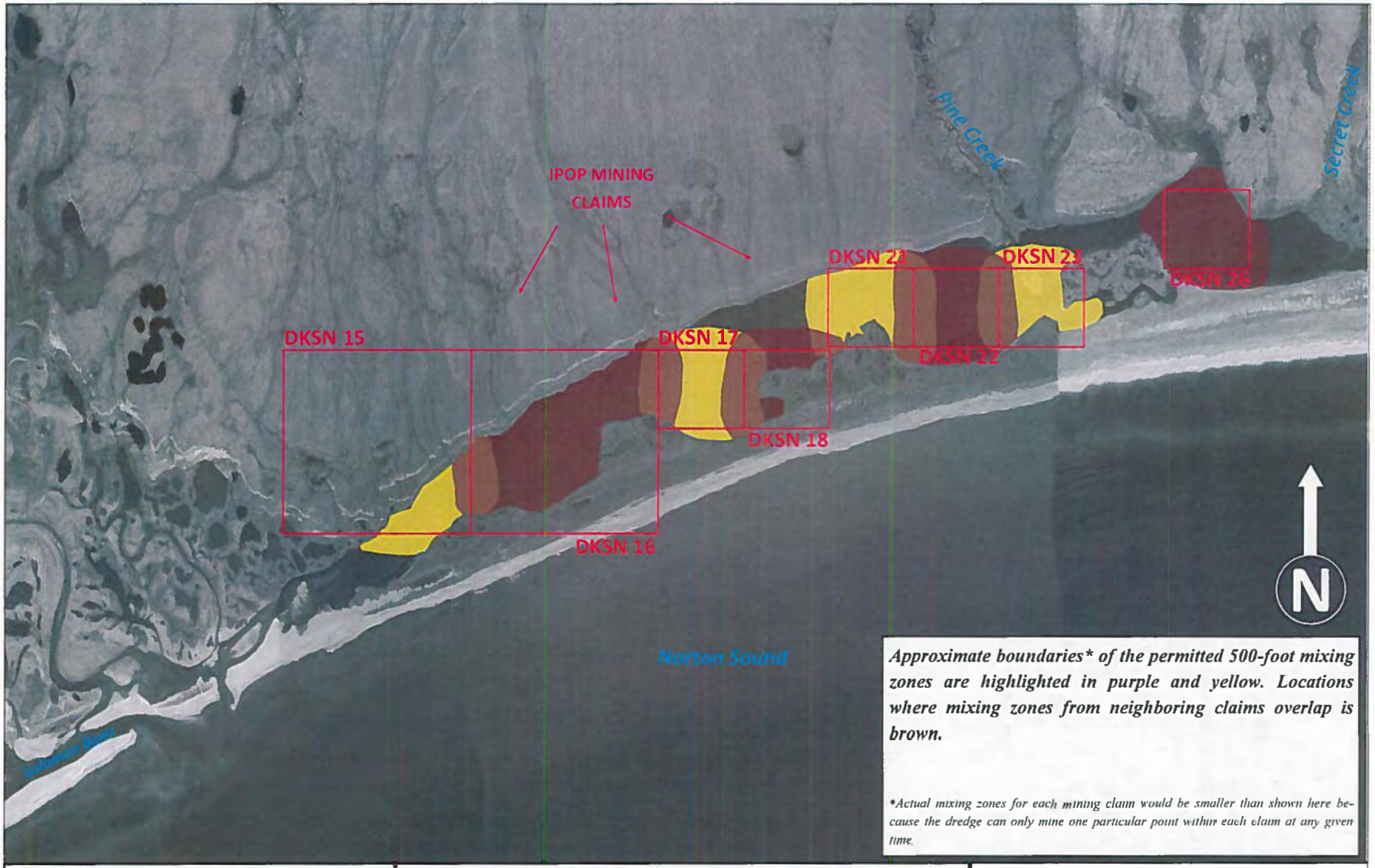
DNR-A-005391



Travis/Peterson Environmental Consulting, Inc.
3305 Arctic Boulevard, Suite 102
Anchorage, AK 99503
907-522-4337

Solomon, Alaska

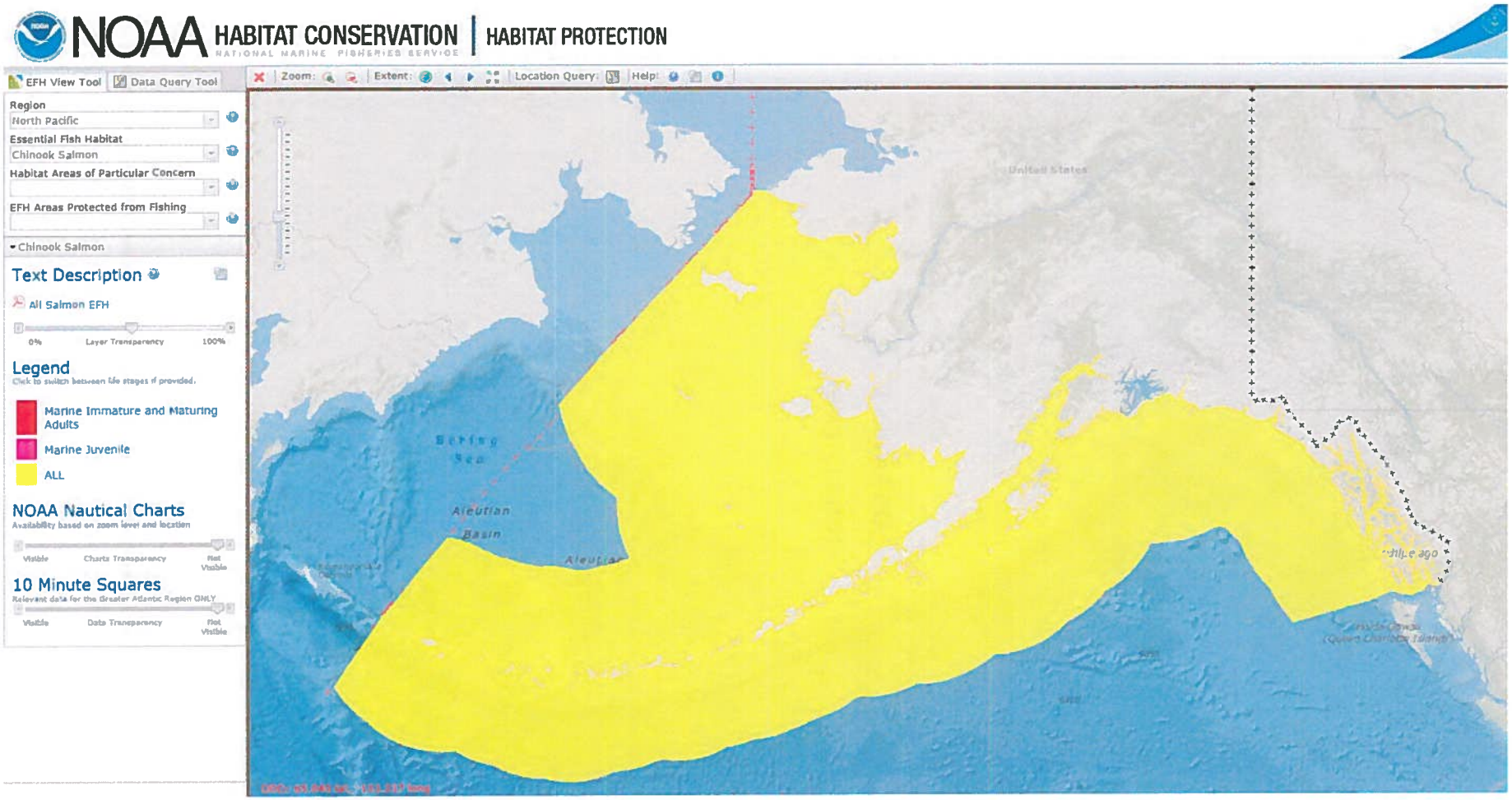
Figure 4 - Mixing Zone Map for DKSN 15-26

Project No: 1610-01	File: Projects/1610/01-Permitting/Figures	Date: 4/11/18	Scale: 1-inch = 2,500-feet

DNR-A-005392

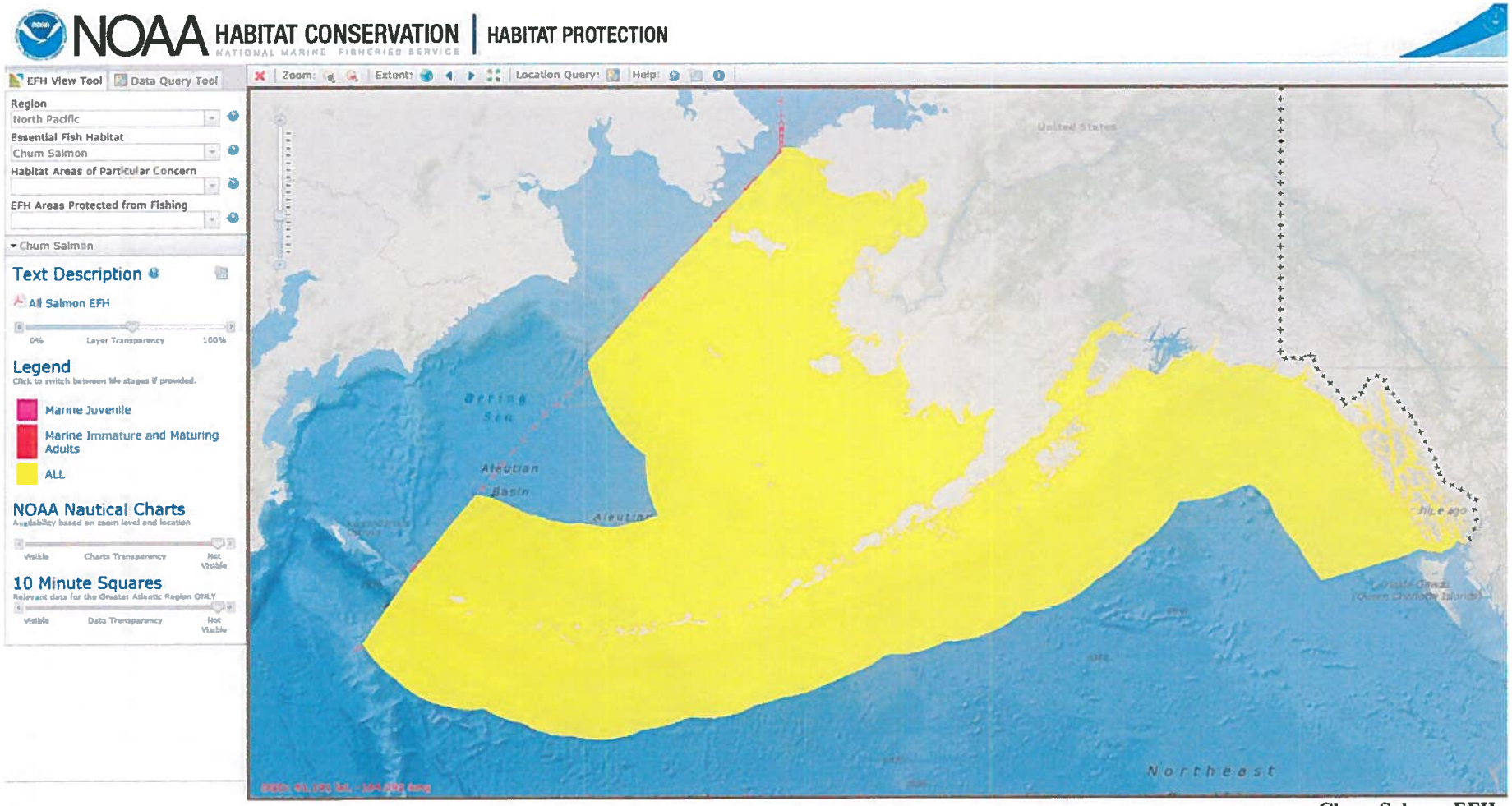
APPENDIX B

NMFS EFH Maps



Chinook Salmon EFH

Accessed April 10, 2018



Chum Salmon EFH

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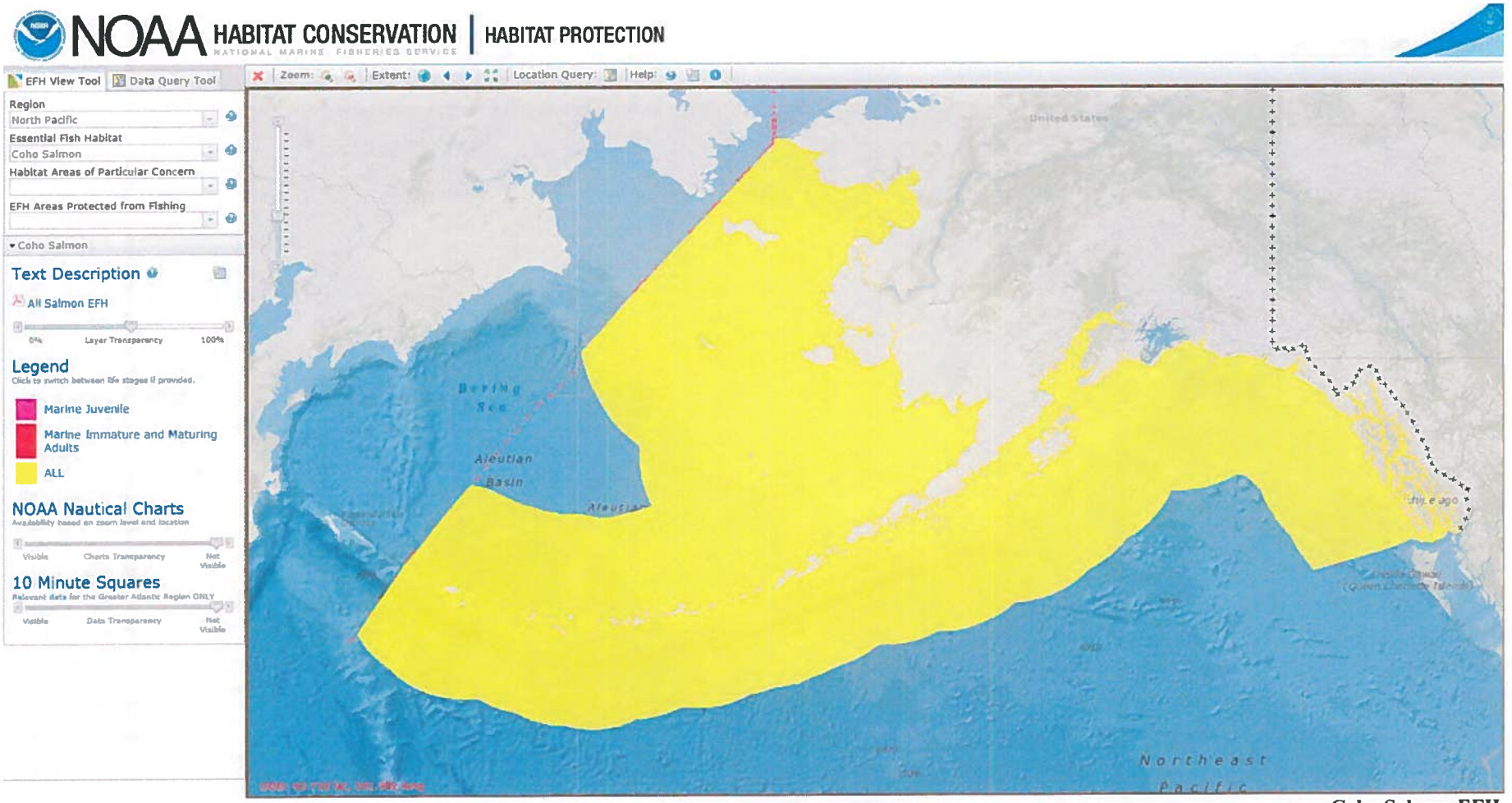
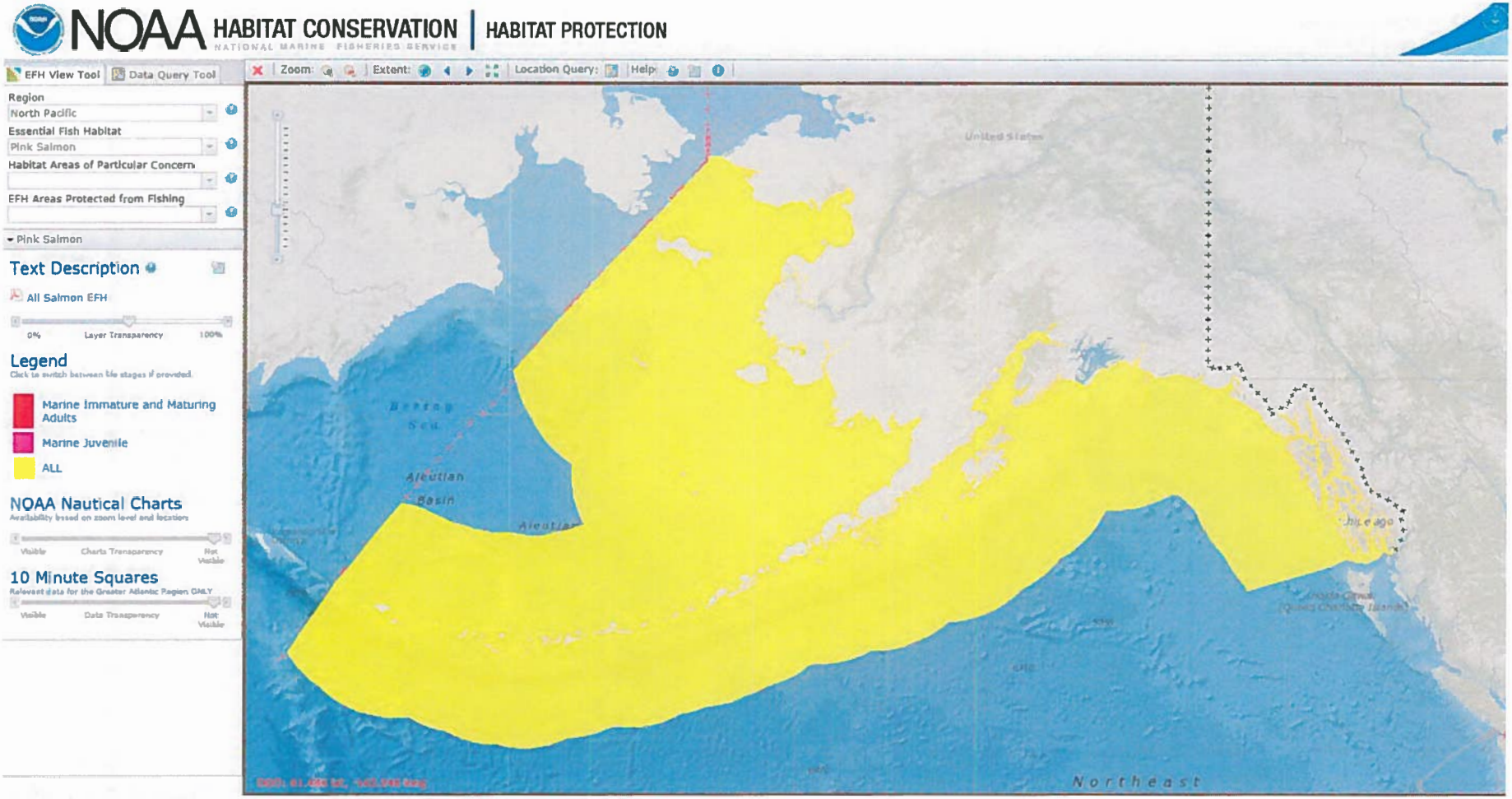


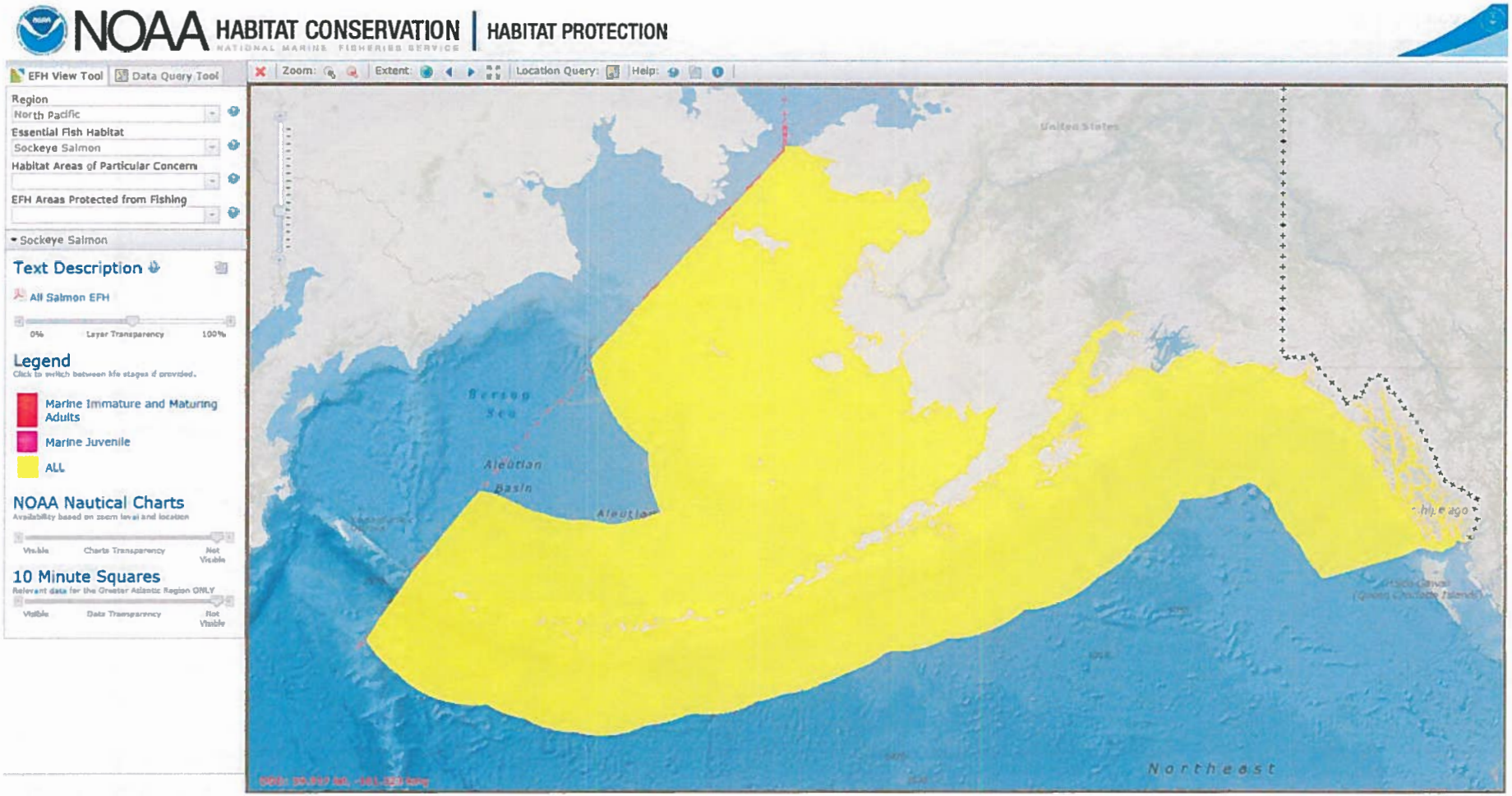
Coho Salmon EFH

Accessed April 10, 2018



Pink Salmon EFH

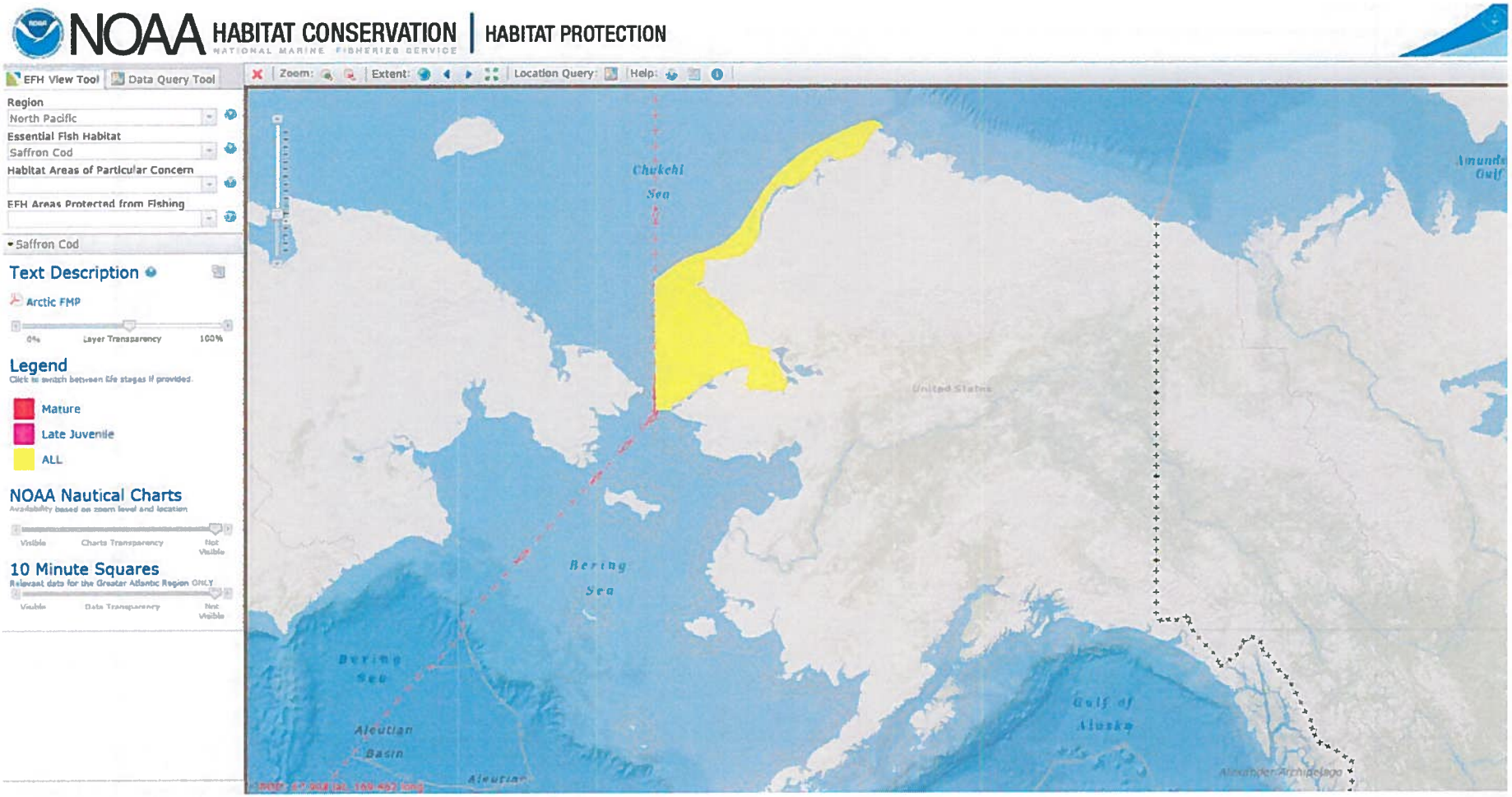
Accessed April 10, 2018



Sockeye Salmon EFH

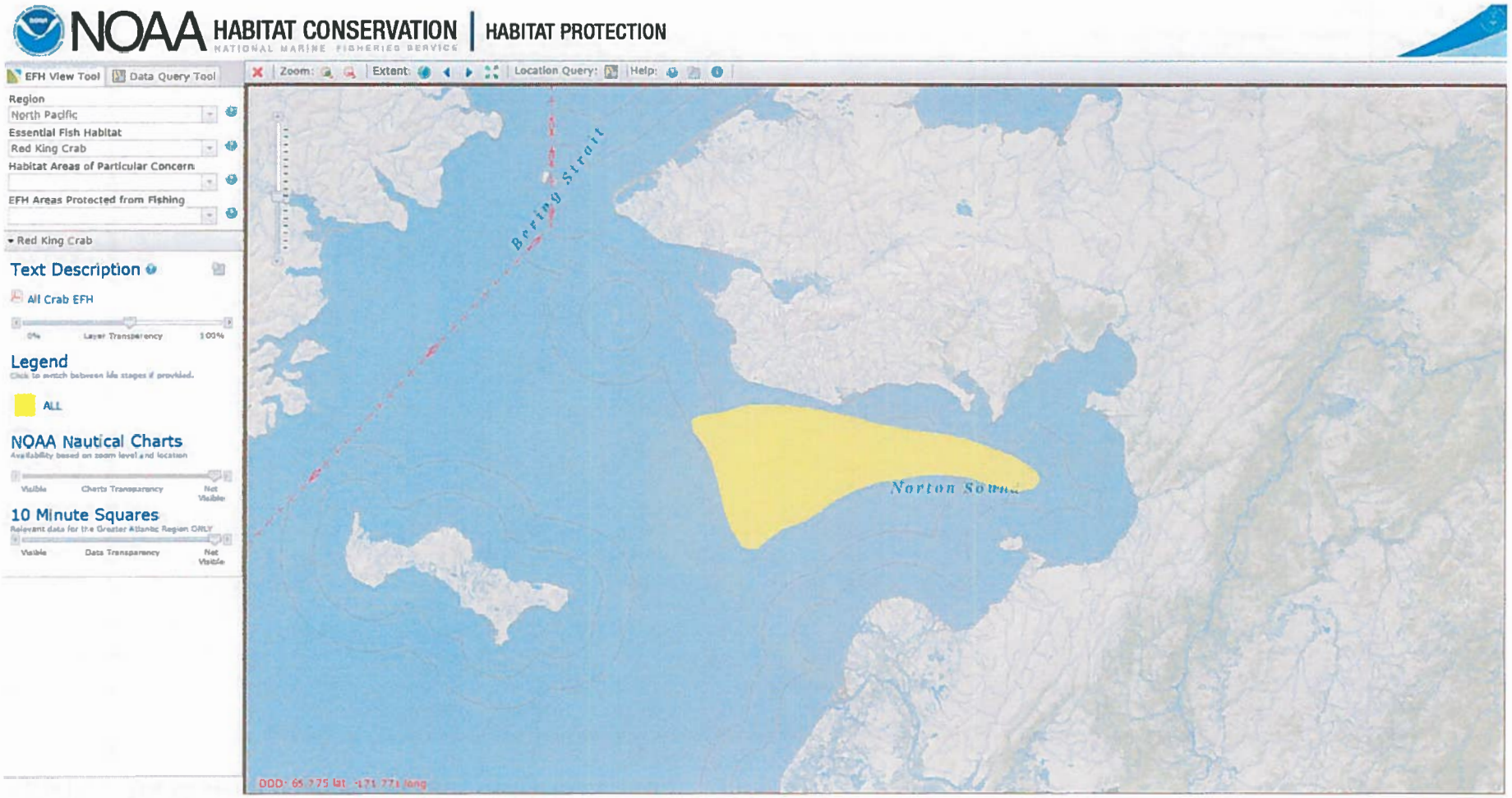
Accessed April 10, 2018

DNR-A-005398



Saffron Cod EFH

Accessed April 10, 2018



Red King Crab EFH

Accessed April 10, 2018

Exhibit 4

Alternatives Analysis

Project Location and Layout Options

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Bonanza Channel	LOC-001	**Origination-** Applicant Proposed Project **Description**- The proposed project involves the development of a placer gold deposit on state ground, in water, in the Nome region of the Seward Peninsula, Alaska. The Applicant's stated project purpose is: *To economically produce gold from the inland water portion of IPOP's mining claims on the Bonanza Channel and Tidal Lagoon using proven technologies that are specifically designed for shallow water estuary dredging and ultra-fine gold recovery.* **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Location- Nome Offshore	LOC-002	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option involves an alternative project located on an offshore mining lease. Such lease areas exist in the Nome region of the Seward Peninsula, Alaska, but these areas have been mined before and depleted the gold resources available to mine and these areas and are not within a shallow, calm water body. **Screening**- 1. Purpose and Need Test: Does not meet the project purpose and may not meet the project need. The area may or may not contain economic concentrations of gold. Additionally working in ocean waters vastly decreases the reach of a ladder-type dredge, significantly affecting the economic potential of mining offshore. 2. Reasonable and Practicable Test: This option is not reasonable nor practicable. There is no guarantee that the mining lease has not been mined before, therefore a given parcel may or may not be economic- this is a great unknown. The Applicant's machinery is designed for shallow, calm water, the freeboard is 18 inches, meaning ocean waves would swamp and sink the dredge. Additionally, the Applicant is experienced working in shallow estuarine locations, therefore this location is not reasonable to assume a successful operation to achieve the project purpose. 3. Environmental Impacts Test: No reason to believe that mining in the offshore would cause fewer environmental impacts than mining in shallow, non-productive estuaries. Additionally , there is no potential environmental benefit to mining offshore. ***Why Eliminated:*** This alternative does not meet the Applicant's stated project purpose. These areas are outside of the experience skillset of the company and the equipment designed by the company will not work in the offshore environment, thus it is not reasonable to assume a successful operation that would achieve the Project Need. Additionally mining offshore does not provide an environmental benefit (compared to the potential benefits of mining on the Bonanza Channel of creating essential fish habitat and/or creating shorebird, seabird habitat with dredged material).	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Nome, Solomon or Surrounding Area, Uplands	LOC-003	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option explores seeking placer deposits on land, in the Nome and the Council-Solomon Mining Districts. No open State of Alaska lands were available to stake claims and although some claims and land exists to purchase or lease in the Nome region of the Seward Peninsula, Alaska, the land is overpriced, and leases are too expensive. Additionally, the upland area of Nome has been mined extensively and gold resources are diminished. Furthermore, a mine in this area would be a surface mine that would have a negative affect on air quality, and visual impacts. **Screening**- 1. Purpose and Need Test: Does not meet the Applicant's stated project purpose as the project purpose is water and location dependent. This option would meet the project need only if the area contains economic concentrations of gold. 2. Reasonable and Practicable Test: This option is not reasonable. No State of Alaska land was available for staking that had not been mined previously, and any land for sale was overpriced. Additionally because the area had been mined in the past the mining has significantly reduced the amount of mineable placer gold resources and it is unknown if an exploration or mining program would identify any resources remaining in this area. The upland areas are not practicable for this operation either, as IPOP's operation is using a shallow water dredge, and these projects would be on land using heavy equipment. ***Why Eliminated:*** Does not meet the project purpose (stated as location and water dependent). This alternative area is an unreasonable place to find a placer project area because there was no ground available to stake mineral claims, and what was available was uneconomical. Additionally exploration records were inconsistent and could not be relied upon and the area had already been well picked over and mined historically. Also this option required a surface mining operation with the associated negative environmental impacts such as noise, disturbance, carbon footprint and negative visual impacts. The Applicant's equipment is designed for use in a shallow water sitting.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Nome, Solomon or Surrounding Area, Productive Placer Rivers or Streams	LOC-004	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option is to seek placer properties in water (streams and rivers) within either the Nome or the Council-Solomon mining district. There are no open State of Alaska lands available to stake claims. Although some claims and land exists to purchase or lease in the Nome region of the Seward Peninsula, Alaska, the land is overpriced, and leases are too expensive. Additionally, all productive streams and rivers of Nome and Solomon and surrounding areas have been mined extensively for 120 years and have significantly reduced the amount of mineable placer gold resources. **Screening**- 1. Purpose and Need Test: Does not meet the Applicant's stated Project Purpose. Meets the project need. 2. Reasonable and Practicable Test: This option is not reasonable as no State of Alaska land was available for staking that had not been mined previously, and any land for sale was overpriced and previous mining had depleted any remaining, mineable gold resources in these areas. Additionally because the area had been mined in the past, it is unknown if an exploration or mining program would identify any resources remaining in these areas. This option is not practicable as the Applicant's equipment is designed for mining sands, not gravels down to bedrock as would be required in the stream setting. ***Why Eliminated:*** This alternative area does not meet the Applicant's stated project purpose. Also, this area is not a good place for the Applicant to find a placer gold project area because there was no ground available to stake mineral claims, and what was available was uneconomical. Additionally exploration records were inconsistent and could not be relied upon, and the area had already been mined for a very long time. Also this option requires a dredge or a surface mining set up that can remove and screen large rocks and gravels down to bedrock. The Applicant's equipment is not designed for this stream-dredging or mining application.	Eliminated from Further Analysis
Location- Other Areas of Alaska	LOC-005	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option requires finding and staking or acquisition of a placer gold project elsewhere in Alaska **Screening**- 1. Purpose and Need Test: Does not meet IPOPs stated project purpose nor does it meet the project need to provide socio-economic benefits to the rural and remote community of Nome and surrounding communities. 2. Reasonable and Practicable Test: No State of Alaska land was available for staking that had known large placer gold resources and had not been mined previously. Land for sale in high producing placer camps has been worked over and no reliable resource estimates are available. Exploration and discovery of new placer deposits is expensive and time consuming and would not be economic. The cost per ounce of gold purchased is more expensive in areas previously mined with depleted resources. ***Why Eliminated:*** 1) this location did not meet the purpose and need test because it would not result in producing gold from the water of the Applicants Claims or providing socio-economic benefits to Nome and surrounding communities. 2) Considering placer gold ground in other areas of Alaska would not work for this project because there was no ground available to stake mineral claims, and what was available would involve a surface mining operation that would likely be uneconomical. Additionally exploration records for placer deposits are often unreliable and inconsistent so the process of location, evaluation, and feasibility would be very time consuming and expensive.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Other areas outside of Alaska	LOC-006	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option requires finding and staking or acquisition of a placer gold project outside of Alaska **Screening**- 1. Purpose and Need Test: Does not meet IPOPs project purpose and need to a) produce gold from the water body on IPOP's claims, b) provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, c) provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments, and d) develop and operate a gold mining project in Alaska in order to meet current and future demand for the metal ***Why Eliminated:*** Does not meet the Purpose and Need Test. The Applicants stated project need is to produce gold commodity from Alaska to provide an economic revenue generator for the State of Alaska and to develop an Alaskan Mine to meet current and future demand constrains the location alternatives; therefore this option does not meet the overall purpose of the project.	Eliminated from Further Analysis
Layout- Proposed Layout: One Continuous Mining Areas (Mining Channel)	LAY-001	**Origination-** Applicant Proposed Project **Description**- This layout is based on locating the mining area in a single continuous "mining channel" located by capturing areas where the applicant had conducted exploratory drilling that indicated the presence of economic gold concentrations. The mining channel is continuous to combine all dredge material disposal sites into a single area, and to mine systematically through the gold-enriched sands to a prescribed depth, resulting in a predictable plan, with predictable results, thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Layout- No Defined Mining Areas	LAY-002	**Origination**- This mine layout option was the first option envisioned by the Applicant. **Description**- This option involves "indicative" mining, whereby the location of gold by mining directs the mining rather than mining being directed by drilling results. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the applicant to be reasonable and practicable. 3. Environmental Impacts Test: This option could conceivably result in a larger seasonal footprint (or acreage of estuarine disturbance), if the gold distribution is erratic and varies with respect to depth. Does not meet minimization requirements and does not pass this test. ***Why Eliminated:*** This option would not provide an environmental benefit and would not meet minimization criteria for the operation.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Layout- Five Individual Separate Annual Mining Areas	LAY-003	**Origination**- This mine layout option was proposed in November, 2019 draft application. **Description**- This layout is based on locating mining areas to avoid vegitated shallows in and around an area that had been sparsely drilled. The reason for the mining area layout was considered to minimize the distruption of vegitated shallows, even though the vegitation was not the eelgrass beds of concern. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the Applicant to be reasonable and practicable at the time. 3. Environmental Impacts Test: The random placement of the seasonal mining areas results in random dredge material disposal site locations, potentially increasing the seasonal disturbance footprint not only annually, but overall. ***Why Eliminated:*** This method and layout results in scattered dredge material disposal sites and islands of un-mined material between the seasonal mining areas that may or do have economic gold concentration and could eventually be mined at some point in the future. Because the mining sequence is not systematic, and because this layout would potentially increase environmental disturbance, this layout does not meet minimization criteria for the operation.	Eliminated from Further Analysis
Layout- Restricted Mining Size	LAY-004	**Origination**- This mine layout is a hypothetical layout in the event of strict regulation restricting the areas the Applicant can mine. **Description**- A small restricted size of the mining area, restricting it to a claim, portion of a claim, or limiting the claims that can be mined. **Screening**- 1. Purpose and Need Test: Does not pass this test. A small restricted layout would conflict with the project need to a) provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments, by significantly reducing the life of mine, and potentially shutting down an operation by reducing or eliminating its internal rate of return. ***Why Eliminated:*** Restricting the area open to mining would have a detrimental economoic effect to the operation.	Eliminated from Further Analysis
Layout- Restricted Mining Depth	LAY-005	**Origination**- This mine layout is hypothetical layout in the event of strict regulation. **Description**- Restricting the operation with respect to depth of dredging. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This layout passes this test. 3. Environmental Impacts Test: There is no environmental benefit to shallow dredging as compared to deep trench dredging. Deep dredging results in less overal acres of disturbance and a smaller annual operational footprint. ***Why Eliminated:*** This method and layout results in larger estuarine disturbance over deep dredging and as a result was eliminated.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Layout- Larger Mine/Dredge Area to Develop More of the Placer Gold Deposit Annually.	LAY-006	**Origination**- This option considers the evaluation to maximize the potential economic benefits of developing the deposit by mining the larger extent of the gold resource over time, resulting in a longer life-of-mine, as the Applicant anticipates after having claimed such a large area. **Description**- This option would increase the mine site and dredging extents over time, extending the duration of the operation to develop more of the known and inferred mineral potential in the estuary. **Screening**- 1. Purpose and Need Test: Meets the purpose and increases the liklihood that the project would meet the Applicant's stated project need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the Applicant to be reasonable and practicable at the time. Shareholders of the company have been told that expanded development is an option. 3. Environmental Impacts Test: This option would slightly increase the environmental impacts, however temporarily by increasing the overall mining footprint. Though because of the well thought out reclamation and dredge material disposal plan, reclamation and natural re-vegitation would conceal this disturbance year to year, with a net environmental effect similar to a one or two year operation. Deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel would be a tremendous environmental benefit to the dying estuary. ***Discussion:*** This option is not eliminated, but considered as a reasonable foreseeable future action because it provides potential environmental benefits, it was not found to be reasonable or practicable at the current time.	Is considered to be a Reasonable Foreseeable Future Action with potential unknown cumulative environmental effects, but also a significant environmental benefit
Dredge Material Disposal Sites- Proposed Layout: Dredge material disposal sites underwater adjacent to the dredge mining channel	DDS-001	**Origination-** Applicant Proposed Project **Description**- This dredge material disposal site layout is based on depositing/locating the dredge material adjacent to the access channel and mining channel at a level right at or below the MLLW (Mean Lower Low Water) level. The mining channel is continuous to combine all dredge material disposal sites into a single area between the mining channel and the N shore of Bonanza Channel thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered. Dredge material disposal sites are locations for temporary storage of material/soils from access trenches, and excess dredged soils (bulk, or swell) that may occur during normal mining operations. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Dredge Material Disposal Sites- Dredge material disposal sites above water adjacent to the dredge mining channel	DDS-002	**Origination**- This DDS option is considered in the event that more swelling/bulking of soil occurs beyond what is expected. **Description**- This dredge material disposal site layout is based on depositing/locating the dredge material adjacent to the access channel and mining channel above the MLLW (Mean Lower Low Water) level in the event that extra storage space is needed should bulking of material exceed what is calculated and expected for this project. The mining channel is continuous to combine all dredge material disposal sites into a single area, and to mine systematically resulting in a predictable plan, with predictable results, thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered. Dredge material disposal sites are locations for temporary storage of material/soils from access trenches, and excess dredged soils (bulk, or swell) that may occur during normal mining operations. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This layout is part of the Applicant's proposed project contingency and mitigation plan, and on that basis, is assumed by the applicant to be reasonable and practicable. 3. Environmental Impacts Test: This option could be a benefit to the environment by creating shallows and mudlfats that may provide habitiat and feeding areas for seabirds, shorebirds and waterbirds.	Included in Action Alternative 2

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Dredge Material Disposal Sites-Uplands	DDS-003	**Origination**- This option considers the evaluation of depositing excess dredge spoil on uplands. **Description**- This option would increase the project footprint, but would allow deepening of the Bonanza Channel for fish habitat. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing, and though the equipment can be added, the potential benefit does not outweigh the costs to the Applicant. 3. Environmental Impacts Test: This option would slightly increase the environmental impacts in the short-term by temporarily by increasing the overall mining footprint. The benefit to the environment may be that natural re-vegitation would conceal this disturbance year to year with grass growth, providing critical upland nesting habitiat for various species of birds and waterfowl. Deposition of dredged material outside of the Bonanza Channel would allow deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel and would be a tremendous environmental benefit to the dying estuary. ***Discussion:*** This option exceeds the scope of the proposed 5 year project. Because expansion is a possible future action, it is not considered an alternative option to the proposed project.	Is considered to be a Reasonable Foreseeable Future Action with potential significant environmental benefits
Dredge Material Disposal Sites-Ocean Beach, Supratidal Deposition	DDS-004	**Origination-** This option considers the evaluation of depositing a percentage of dredge spoil along the shore of Norton Sound in the supratidal zone **Description**- This alternative considers pumping a percentage of the dredge spoil/soil across the Nome-Council Highway to the beach and deposit in the supratidal zone for beach renourishment. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing and heavy equipment would be needed on the barrier island to distribute the sand along the beach. Though the equipment can be added, the potential benefit does not outweigh the costs to the Applicant at this time. 3. Environmental Impacts Test: This option would provide a net benefit to the environment providing beach nourshment for the barrier island that is constantly washing away due to longshore currents. The deposition of sediment in the supritidal zone would potentially create a food source for various species of shorebirds, seabirds and waterbirds. Deposition of dredged material outside of the Bonanza Channel would allow deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel and would be a tremendous environmental benefit to the dying estuary. ***Why Eliminated:*** This option is not practicable for cost reasons, and may not be a reasonable alternative as it would alter the shorelines of adjacent private property.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Dredge Material Disposal Sites-Ocean Beach, Intratidal Deposition	DDS-005	**Origination-** This option considers the evaluation of depositing a percentage of dredge spoil along the shore of Norton Sound in the intratidal zone **Description**- This alternative considers pumping a percentage of the dredge spoil/soil across the Nome-Council Highway to the beach and deposit in the intratidal zone for beach renourishment. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing, but because the material would be deposited in the intratidal zone wave action and longshore currents would re-distribute the sand along the beach naturally. Though this pumping capacity can be added to the project, the potential benefit does not outweigh the costs to the Applicant at this time. 3. Environmental Impacts Test: This option would provide a net benefit to the environment providing beach nourshment for the barrier island that is constantly washing away due to longshore currents. Deposition of dredged material outside of the Bonanza Channel would allow deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel and would be a tremendous environmental benefit to the dying estuary. ***Why Eliminated:*** This option is not practicable for cost reasons at this time.	Is considered to be a Reasonable Foreseeable Future Action with potential significant environmental benefits

Mining Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Mining Type- Cutterhead Dredge Mining	MIN-001	**Origination-** Applicant Proposed Project **Description**- This option is central to the ideas, planning and economics of the proposed project which consists of using a cutterhead dredge to mine the gold-rich sands in the shallow estuary. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Mining Type- Bucket Line Dredge Mining	MIN-002	**Origination**- Historically much of the Seward Peninsula was mined using bucket-line dredges. **Description**- This option involves mining using a series of buckets on a chain that are constantly digging, requiring no pumps to move material up to the processing plant. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method is out of date, old technology, and is too slow and maintenance-intensive to be considered a practicable means for mining in this location, more suited to rocky stream and river beds, or large stretches of historical beach area like around the Nome Uplands. ***Why Eliminated:*** This alternative is slow compared to MIN-001, this coupled with the high maintenance costs make this method un-economic.	Eliminated from Further Analysis
Mining Type- Tailing Suction Dredge Mining	MIN-003	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a larger self-propelled vessel that moves along the waterbody whilst dragging one or two trailing suction heads with hard-faced teeth. A combination of water sprays and the dragging and suction remove channels of material, essentially vacuuming sediment as it travels. Of all dredging methods this method is said to be one of the most effective at collecting a majority of the heavy mineral component of the material being dredged. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This alternative does not pass this test because this method requires a large vessel, generally designed for deepening ship passages, it would be unable to float in the shallow 2-4ft waters of Bonanza Channel. ***Why Eliminated:*** This alternative will not work in shallow waters.	Eliminated from Further Analysis
Mining Type- Standard Suction Dredge Mining	MIN-004	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a single or a series of smaller 8-10 inch floating suction dredges operated by divers. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) woudl not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments. ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis

Mining Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Mining Type- Backhoe or Dipper Dredge	MIN-005	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a dredge outfitted with an excavotor, or a clamshell style dipper that is lowered into the water either on a hydraulic arm (backhoe) or a cable (dipper). The dipper or bucket picks up material and is retrieved to the surface and dumped in a hopper. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) woudl not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments. ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis
Mining Type- Dragline Dredge	MIN-006	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a dredge outfitted with a dragline bucket that is winched between a fixed location ahead of the dredge and the dredge itself. The bucket scoops up material and is retrieved to the surface of the water and dumped in a hopper. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for meeting the project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) woudl not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis
Mining Type- Wash Plant, Sluces and Fine Gold Jigs	MIN-007	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves moving sediment with excavators or loaders, hauling with a truck to a washplant where the material is screened and processed through a series of sluce boxes and gravity circuit equipment to recover various size fractions of gold. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) would not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments 2. Reasonable and Practicable Test: This alternative does not pass this test because this method is not reasonable for mining fine sand from under water in an estuary. ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis

Processing Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Facility Location & Process Type- On-site Gold Concentrate Production	PRO-001	**Origination-** Applicant Proposed Project **Description**- This alternative is part of the proposed project in which the material dredged from the operation will be processed on-site on a processing barge that follows the dredge. Material is transported to the processing barge with a long flexible pipe. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Facility Location & Process Type- Alternate-site Ore Processing	PRO-002	**Origination**- The Applicant evaluated the option of "off-site" or "alternate-site" processing when designing the project. In this case off-site meant processing material "outside of the estuary". **Description**- This option involves dredging ore, or sediment, and piping it to an alternate location for processing. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as pumping costs would make this option less reasonable than the alternative PRO-001. Additionally, this option is less practicable than PRO-001 as it requires either access across lands to the coastal processing location, or a very long pipe that would need to be semi-permanent and would need to be constantly lengthened. 3. Environmental Impacts Test: Increased environmental impacts will result on land. ***Why Eliminated:*** This alternative is not Reasonable or Practicable compared to PRO-001.	Eliminated from Further Analysis

Mining Rate Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Mining Rate- 267 Yd/Hr	YPH-001	**Origination-** Applicant Proposed Project **Description**- This alternative is part of the proposed project in which the material is dredged at a design rate of 267 cubic yards per hour. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Mining Rate- Reduced Mining Rate	YPH-002	**Origination**- The Applicant evaluated the option of smaller dredge throughputs. **Description**- This option involves dredging ore at a throughput less than YPH-001 **Screening**- 1. Purpose and Need Test: Because project economics for fine grained low grade placer gold are sensitive to gold price, recovery and throughput (production) this option does not pass this test becuase it has the potential to not a) provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments ***Why Eliminated:*** This alternative does not pass the Purpose and Needs Test.	Eliminated from Further Analysis
Mining Rate- Expanded Mining Rate	YPH-003	**Origination**- This option considers the evaluation to maximize the potential economic benefits of developing the deposit by mining at a much faster rate resulting in a shorter life-of-mine, but a more profitable operation. **Description**- This option would increase the dredge throughput (production) consequently increasing the daily, monthly and annual gold production. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the Applicant to be reasonable and practicable at the time. Shareholders of the company have been told that increased dredge throughput is an option. 3. Environmental Impacts Test: This option would slightly increase the environmental impacts by increased turbidity and larger overall seasonal mining footprint. Though because of the well thought out reclamation and dredge material disposal plan, reclamation and natural re-vegitation would conceal this disturbance year to year, with a net environmental effect similar to a one or two year operation. ***Dsicussion:*** This option exceeds the scope of the proposed 5 year project. Because throughput modifications are a possible future action, it is not considered an alternative option to the proposed project.	Is considered to be a Reasonable Foreseeable Future Action for meeting the stated project need

Gold Recovery Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Gold Recovery-Gravity	AUR-001	**Origination**- Applicant proposed project. This option considers the evaluation to maximize the potential economic benefits of the project by processing the sands using strictly gravity separation. **Description**- This option would use nugget boxes followed a centrifuge technology coupled with spirals specifially designed to recover very fine gold out of the sands, clays and silts to recover the maximum percentage of gold. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Gold Recovery-Cyanide	AUR-002	**Origination**- This option considers the evaluation to maximize the potential economic benefits of the project by processing the concentrates using a small cyanide CIL processing unit. **Description**- This option would use cyanide to dissolve gold out of the concentrate and tailings to recover any gold too fine for the gravity circuit. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as the costs associated with this method would make this option less reasonable than the alternative PRO-001. Additionally, this option is less practicable than PRO-001 as it requires the use of a chemical solvent and creates a potential environmental liability. 3. Environmental Impacts Test: Cyanide is toxic to aquatic organisms, wildlife and humans. This option does not pass this test as it would increase the risk to the environment and not provide an environmental benefit. ***Why Eliminated:*** This option is not reasonable nor practicable and increases the potential risk to adverse environmental impacts form the transportation, storage and use of cyanide.	Eliminated from Further Analysis
Gold Recovery-Mercury	AUR-003	**Origination**- This option considers the evaluation to maximize the potential economic benefits of the project by processing the concentrates using mercury. **Description**- This option would use mercury to recover gold from the concentrate too fine for the gravity circuit. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as the costs associated with this method would make this option less reasonable than the alternative PRO-001. Additionally, this option is less practicable than PRO-001 as it requires the use of a toxic element creates a potential environmental liability. 3. Environmental Impacts Test: Mercury is toxic to aquatic organisms, wildlife and humans. This option does not pass this test as it would increase the risk to the environment and not provide an environmental benefit. ***Why Eliminated:*** This option is not reasonable nor practicable and increases the potential risk to adverse environmental impacts form the transportation, storage and use of mercury.	Eliminated from Further Analysis

Access Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Project Access-DOT ROW Nome-Council Hwy	PAC-001	**Origination-** Applicant Proposed Project **Description**- This option considers accessing the project via the Nome-Council Highway, State of Alaska public Right-of-Way (ROW). **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Project Access-Other Alternatives	PAC-002	**Origination-** This option considers other options to accessing the mining claims. **Description**- This option considers accessing the project via alternative routes, other than the Nome-Council Highway. **Screening**- The only other access options are by ocean or by air, both are neither practicable or reasonable for an area accessed by a public ROW.	Eliminated from Further Analysis
Mining Access-State of Alaska Land	MAC-001	**Origination-** Applicant Proposed Project **Description**- This option considers accessing the mining area through State of Alaska land on State of Alaska Mineral Claims held by the Applicant. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Mining Access-Private Land	MAC-002	**Origination**- This option considers accessing the mining area from private land. **Description**- This option considers accessing the mining area through private land along the Nome-Council Highway. This access route would require the Applicant to either 1) Lease land from a private landowner whose land borders the Appliant's State of Alaska Mineral Claims, or 2) Purchase land bordering the State of Alaska Mineral Claims from a private landowner to use as access to the mining area. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This access is both Reasonable and Practicable for accessing some of the mining claims. 3. Environmental Impacts Test: This access does not pose any environmental risks or benefits.	Included as Action Alternative 2
Mining Access-Federal Land	MAC-003	**Origination**- This option considers accessing the mining area from Federal Land. **Description**- This option considers accessing the mining area through Federal land on the southwest side of the claim block. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as the applicant does not have Federal Mineral Claims. ***Why Eliminated:*** This option is not reasonable nor practicable.	Eliminated from Further Analysis
Dredge Access-Access Channel - State of Alaska Mining Claims	DAC-001	**Origination-** Applicant Proposed Project **Description**- This option considers constructing and maintaining an access channel to the proposed seasonal dredging areas on State of Alaska Mining Claims. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1

Access Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Dredge Access-Access Channel - Solomon Bridge Boat Ramp	DAC-002	**Origination**- Evaluation of accessing the dredging area from the boat ramp, near Solomon bridge, that is with the State of Alaska, DOT, public easement and ROW. **Description**- This dredge access route option was evaluated by the Applicant when developing the project plans to use this location for accessing claims near and to the East of the Solomon Bridge. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This access is both Reasonable and Practicable for accessing some of the mining claims. 3. Environmental Impacts Test: This access does not pose any environmental risks or benefits.	Included as Action Alternative 2
Dredge Access-Access Channel - Safety Sound	DAC-003	**Origination**- Evaluation of accessing the dredging area from Safety Sound **Description**- This dredge access route option was evaluated by the Applicant when developing the project plans to use this location for accessing the western-most claims nearest Safety Sound. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This access is not reasonable, as it would require a longer access channel to be dredged and maintained to the mining area. 3. Environmental Impacts Test: This access could have an environmental benefit of deepening the channel for the passage of fish. ***Why Eliminated:*** This option is not reasonable as it would require a longer access channel that would need to be dredged/deepend, and maintained. This longer access channel also stands a greater chance of affecting wildlife as it would create more hours of boat traffic in Bonanza Channel.	Eliminated from Further Analysis

Camp and Power Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Camp Location-DOT ROW Nome-Council Hwy, State Mineral Claim DKSN 35	CMP-001	**Origination-** Applicant Proposed Project **Description**- This option considers a camp location on mineral claims held by the Applicant adjacent to the Nome Council Highway **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Camp Location-Private Land	CMP-002	**Origination**- Evaluation of locating camp on private land near the mining area **Description**- This camp option considers leasing or purchasing private land from nearby landowners for a camp location. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is Practicable for placing a camp near the mining claims, but not reasonable considering private ground is held by various people, who may or may not rent or sell, and who may or may not be close to the mining area, and who may or may not charge a reasonable rate for using their land. 3. Environmental Impacts Test: This camp option may mean a longer access channel to the dredging area, suseqently larger dredge material disposal sites, and more phyiscal disturbance of the estuary.	Included as Action Alternative 2
Camp Location-No Camp	CMP-003	**Origination**- Evaluation of no camp near mining area **Description**- This camp option considers no camp for the operations, and workers commuting daily from Nome to the work site **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option does not pass the Reasonable and Practicable test. It is not reasonable to operate the project without a camp as it is >28 miles from Nome on a rough, washboard gravel road because of the wear and tear on vehicles, and workers working 12 hour shifts, driving nearly an hour before and after work. This option is not practicable either, as the costs of housing a crew in Nome and the annual cost of fuel, tires and vehicle maintenance and liability far outweigh the costs of supplying a man-camp for the operation. 3. Environmental Impacts Test: This camp option is not a benefit to the environment, as it would substantially increase the daily traffic on the Nome-Council gravel highway, creating dust and noise that could affect the birds along the Bonanza Channel. Additionally a camp with a satellite internet system is preferable for uploading real-time environmental monitoring data. ***Why Eliminated:*** This option is not reasonable or practicable because of costs and liability. The option of not having a camp increases road traffic, which in turn creates more dust, more disruption to the birds in the area, and increases the project's carbon footprint.	Eliminated from Further Analysis
Project Power-On Site Power Generation-Diesel Generator	POW-001	**Origination-** Applicant Proposed Project **Description**- This option considers a dual diesel powered 55kWe stationary power source (generators) located on mineral claims held by the Applicant adjacent to the Nome Council Highway. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1

Camp and Power Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Project Power-On Site Power Generation-Natura Gas Generator	POW-002	**Origination**- Evaluation of a cleaner burning natural gas generator for a power source **Description**- This camp option considers using natural gas-fired generators as opposed to diesel. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is Practicable because there is no natural gas supply source in this area. ***Why Eliminated:*** This option is not practicable as natural gas is not readily avaiable in the area of the project.	Eliminated from Further Analysis

Environmental BMP and Reclamation Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Turbidity Control- Silt Curtain - 100% Operation Containment	TUR-001	**Origination-** Applicant Proposed Project **Description**- This option considers a bottom-mounted silt curtain surrounding the entire dredging operation, 10-12 acres at a time, to create a 100% turbidity containment and fish barrier. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Turbidity Control- Silt curtain surrounding processing barge only	TUR-002	**Origination**- Evaluation of surrounding only the processing barge with a silt curtain, original proposed plan **Description**- This option considers surrounding only the processing barge with a silt curtain that hangs above the bottom of the mining channel. This option was envisioned to control turbitity by allowing fines to flocculate naturally within the curtain and stay out of the waterway. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option was believed to be practicable, but the applicant determined it was not reasonable to assume that this method would allow them to meet the 100ft mixing zone from an outfall as required by the ADEC. 3. Environmental Impacts Test: This alternative posed a risk of non-compliance to ADEC turbidity limits outside of the 100ft mixing zone. Additionally, this method did not create a fish barrier to keep fish out of the mining/dredging area. ***Why Eliminated:*** This option poses a risk of non-compliance to ADEC turbidity limits outside of the 100ft mixing zone. Additionally, this method did not create a fish barrier to keep fish out of the mining/dredging area.	Eliminated from Further Analysis
Turbidity Control- No Turbidity Control	TUR-003	**Origination**- Evaluation of using no turbidity control for the dredging operation in conjunction with DDS-005. **Description**- This option was considered with DDS-005 (pumping dredge spoils/soil) to the intratidal zone of Norton Sound if 100% of the dredge material was disposed in the ocean. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing, and is not reasonable to assume that there would be zero turbidity from the mining operation and be able to meet the 100ft mixing zone requirements imposed by ADEC. ***Why Eliminated:*** This option poses a risk of non-compliance to ADEC turbidity limits outside of the 100ft mixing zone. Additionally, this method did not create a fish barrier to keep fish out of the mining/dredging area.	Eliminated from Further Analysis
Turbidity Monitoring- Real Time Buoys or Tripods	MON-001	**Origination-** Applicant Proposed Project **Description**- This option considers either a floating or a bottom-mounted tripod monitoring station both up- and down-current of the mining operation that would capture, record and upload real-time turbidity, conductivity, water temperature, weather, flow velocity data and send turbidity exceedance alarms to the dredge operator for quick response in the case of a failed turbidity BMP. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1

Environmental BMP and Reclamation Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Turbidity Monitoring-Physical	MON-002	**Origination**- Evaluation of monitoring turbidity physically with the use of a Secchi disk and a hand-held portable turbidity multi-probe that measures pH, ORP, conductivity, turbidity and temperature. **Description**- This option considers periodic physical measurements of mixing zone conditions by a environmental technician. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option was believed to be practicable and reasonable using the hand-held multiprobe instead of the Secchi disk in low light conditions. 3. Environmental Impacts Test: This alternative benefits the environment by measuring and comparing background, up-current conditions with down-current mixing zone conditions. Because this system is human-dependent, it relies upon diligence and training of the technician and requires constant record-keeping. Because this system is not real-time, response/correction to a turbidity release will be slower than MON-001. Thus this option represents trade-offs and is carried forth for detailed consideration.	Included in Action Alternative 2
Turbidity Monitoring-None	MON-003	**Origination**- The option of no continuous turbidity modeling was briefly contemplated by the applicant **Description**- This option considers no monitoring of turbidity. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This alternative is not reasonable given the stakeholder and agency concern over turbidity levels from this operation. 3. Environmental Impacts Test: This alternative does not create any environmental benefit and provides no method of understanding or documenting either ever-changing background or mining/dredging turbidity levels. ***Why Eliminated:*** This option was not reasonable from the perspective of the ADEC who would require monitoring as a stipulation of the permit.	Eliminated from Further Analysis
Reclamation-Concurrent Partial Re-establishment of Natural Bottom Profile	REC-001	**Origination-** Applicant Proposed Project **Description**- This option considers reclamation concurrent with mining. The process involves: 1) Measuring and modeling pre-mining depth with sonar and GPS, 2) Dredging and processing soils, 2) Depositing soils bulk/swell (if present) into the shallows of the dredge material disposal sites creating shallows for critical water/shore/sea bird habitat, 3) Deposition of remaining soil in a sweeping pattern over the dredged out bottom until the prior mining depth is attained in the mining trench, or until MLLW elevation is reached (as indicated by sonar and GPS on the processing platform) while leaving the access channel at a newly established depth of 10' BMHW. The benefit to leaving the access channel to the new depth of 10' BMHW is to improve navigability and/or depth required for fish passage and possible establishment of eel grass beds. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review, specifically the benefit to the environment to restoring the channel to its pre-mining condition.	Included in Action Alternative 1

Environmental BMP and Reclamation Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Reclamation-Concurrent 100% Re-establishment of Natural Bottom Profile	REC-002	**Origination**- Evaluation of reclaiming the bottom of the entire Bonanza Channel to pre-mining depth profiles as proposed in previous preliminary project descriptions. **Description**- This option considers concurrent mining/reclamation. The process involves: 1) Dredging and processing soils, 2) Depositing soils in a sweeping pattern over the dredged out bottom unilt the prior mining depth is reached. This method assumes a bulking factor of 0, meaning the material will not swell or expand after it is dredged up and processed. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is a practicable alternative because the dredge and processing equipment has Trimble GPS location mapping coupled with sonar and sophisitcated software that develops a point-cloud bottom profile before mining, and lets the operators know when reclamation/re-deposition of dredged material is restored to the pre-mining depth. However, it is not reasonable to assume a bulking factor of 0, and the Applicant expects some material bulking through this mining process. ***Why Eliminated:*** This option is not reasonable because the probability of the dredged material not bulking (swelling or expanding) is very low.	Eliminated from Further Analysis
Reclamation-Dredging and Deepening/ Improvement of Bonanza Channel - No Reclamation	REC-003	**Origination**- Evaluation of the option of improving fish habitat by deepening the Bonanza Channel. **Description**- This option was considered with DDS-005 (pumping dredge spoils/soil) to the intratidal zone of Norton Sound whereby 100% of the dredge material was disposed in the ocean. In this scenario, the bottom depth of the channel would be left at 30-31 feet below MHW (Mean High Water). **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing. 3. Environmental Impacts Test: This option provides the best environmental benefit to the future of Bonanza Channel because: 1) Increasing the water depth would allow natural establishment of eel grass beds (that need deep water to exist), 2) The new eelgrass habitiat would be beneficial to the Salmon population, 3) The deep channel would provide safe salmon rearing and possibly improve the productivity of the Bonanza and Solomon River fisheries. ***Why Eliminated:*** This option is not practicable because of the designed equipment configuration, and adding this capability would be expensive. Additionally, there is a lack of stakeholder commitment to the improvement of the estuary.	Is considered to be a Reasonably Foreseeable Future Action with potential significant environmental benefits. (*See DDS-005)*

Exhibit 5

Fuel Tank Specifications

SPECIFICATION DATA SHEET I MODEL : 30TCG

TRANS CUBE

Extend the run times of your diesel powered equipment with the **TRANS**CUBE™ 30TCG. *Increased Efficiency + Decreased Expenses = Maximized Revenue*.

- **Transportable.** Full load lifting eyes, forklift pockets and internal baffles designed to allow handling of the tank full of fuel.
- **Stackable.** Easily stackable (2)-high full of fuel and (3)-high empty to reduce storage space requirements.
- **Accessible.** Access manway for maintenance and inspection of inner tank. Removable inner tank for servicing and cleaning.
- **Efficient.** Lockable equipment cabinet locks and secures equipment and fuel ports to run up to 3 pieces of diesel-powered equipment.
- **Environmentally Safe.** Double-walled, 110% containment eliminates the need for spill pans, UL 142 approved.

SPECIFICATIONS*	
STANDARD FITTINGS: High accuracy contents gauge; 3"Fill Point; 2" fusible link fill port; 1" pump feed with flexible dip pipe, strainer & non-return valve; (1) engine feed and return port set; pressure/vacuum vent; breather vent. OPTIONAL FITTINGS: Complete transfer pump kits; water & particulate filter kits; fuel up to (2) feed & return blocks; fuel hose & quick couplers.	
Capacity (Brim-Fill) Litres: 3000	**Dimension Height (mm/in):** 1315 mm/51.77"
Capacity (Brim-Fill) Imperial Gallons: 660	**Weight Empty (lbs/kg):** 2234 lbs (1013kg)
Capacity (Brim-Fill) US Gallons: 793	**Weight Full (lbs/kg):** 8855 lbs (4016kg)
Dimension Length (mm/in): 2298 mm/90.45"	**Approvals:** UL142, ULC S-601-07, SUN IBC Type 31A,
Dimension Width (mm/in): 1548 mm/60.94"	UN DOT, NFPA, Transport Canada, Vlarem, Kiwa

*Model specifications may slightly differ based on stock availability in your area. Please contact your local representative to confirm tank specifications.

SPECIFICATION DATA SHEET I MODEL : 40TCG

TRANS CUBE

The TRANSCUBE™ 40TCG is a versatile fuel deployment solution for larger diesel-powered equipment. With 1,000 gallons of back-up fuel, your need for fuel truck visits is decreased, which in turn helps you to lower your carbon footprint and your expenses!

- **Transportable.** Full load lifting eyes, forklift pockets and internal baffles designed to allow handling of the tank full of fuel.
- **Stackable.** Easily stackable (2)-high full of fuel and (3)-high empty to reduce storage space requirements.
- **Accessible.** Access manway for maintenance and inspection of inner tank. Removable inner tank for servicing and cleaning.
- **Efficient.** Lockable equipment cabinet locks and secures equipment and fuel ports to run up to 3 pieces of diesel-powered equipment.
- **Environmentally Safe.** Double-walled, 110% containment eliminates the need for spill pans, UL 142 approved.

SPECIFICATIONS	
STANDARD FITTINGS: High accuracy contents gauge; 3"Fill Point; 2" fusible link fill port; 1" pump feed with flexible dip pipe, strainer & non-return valve; (1) engine feed and return port set; pressure/vacuum vent; breather vent. OPTIONAL FITTINGS: Complete transfer pump kits; water & particulate filter kits; fuel up to (2) feed & return blocks; fuel hose & quick couplers.	
Capacity (Brim-Fill) Litres: 3785	**Bund Material Thickness (in):** 1/8"
Capacity (Brim-Fill) Imperial Gallons: 833	**Inner Tank Material Thickness (in):** 1/8"
Capacity (Brim-Fill) US Gallons: 1000	**Weight Empty (lbs/kg):** 2724 lbs (1235kg)
Dimension Length (mm/in): 2312 mm/91"	**Weight Full (lbs/kg):** 9370 lbs (4251kg)
Dimension Width (mm/in): 2200 mm/87"	**Approvals:** UL142, ULC S-601-07, NFPA,
Dimension Height (mm/in): 1220 mm/48"	Transport Canada, Vlarem, Kiwa
Dimension Cabinet Opening (mm/in): 850.9 mm x 355.6 mm/ 33.5" x 14"	

P12

- 3,124 US GAL
  11,834 LITRES
  2,603 IMP GAL
- 118 x 96 x 114 IN
  2,997 x 2,438 x 2,896 MM
- 8,816 LBS
  3,999 KG

Exhibit 6

System Pump Curve

SYSTEM CURVE AND PUMP EVALUATION

FOR: ROG Dredge Dredge

Pipe Description: 12SDR11

Input Data: (Mark one Only)

Discharge Side of the Pump:	10		Material: 6	
Line Length*	300	Ft.		1
Inside Diameter	10.3	Inches		2
Allowance for Ball Joints, Etc.	5	Ft of Hd		3
Elevation of Discharge above Water	30	Ft		4
Plastic(P) or Steel(S)	p	0.02		5
				6
Suction Side:				7
Line Length	35			8
Inside Diameter	12	inches		9
Digging Depth	25	Ft		10
Height of Pump above digging depth	25	Ft		11
Impeller				
Impeller Size:	25		*Additional Discharge Input:	
RPM	647		Line Length	0
Pulley/Transmission Ration (X:1)	2.65		I.D.	11
Pumping and Slurry Conditions:			Plastic(P) or Steel(S)	p
Percent Solids by Weight	25	Percent		0.02
Quantity	5000	GPM	} One must be zero	
Dry Solids	0	Tons/Hr	} One must be zero	
Specific Gravity of the Liquid	1			
Pumping Efficency	0.65			

Calculations:

Percent Solids by Volume	11.2		2.65	Sp. Gr. of Solids	
Specific Gravity of the Mix	1.184		1.28		
Tons per Hour of dry Solids	371		267.3	CuYds/Hr	(approx)
PPSI Minimum Suggested Velocity	12.3	Ft/Sec	MTI-Vcrit	10.13	Ft/Sec
Quantity	5,000	GPM			
Discharge Line velocity	19.3	Ft/Sec	Pipe Area	0.58	ft.^2
Suction Line Velocity	14.2	Ft/Sec	Pipe Area	0.79	ft.^2
Target Velocity	14.7	Ft/sec			
Head Required					
Discharge Pipe Friction	31	Ft.	1.85	Exponent	
Suction Pipe Friction	2.09	Ft.			
Entrance Losses	4	Ft.	Discharge Pressure Required:		
Sp. Gr. / D.D	5	Ft.	2		
Acceleration	6	Ft.			
Elevation	36	Ft.	Incoming Pressure:		
Other (Input)	5	Ft.	0		
Total Pump He	93	Ft.	PSI:	47	
Horse Power Required	213		Est. Fuel Req'd	8.9	Gals/Hr
Engine RPM	1714		Discharge Pressure	47	
Impeller Tip Speed (FPM)	4,233		Recommend < 6600		

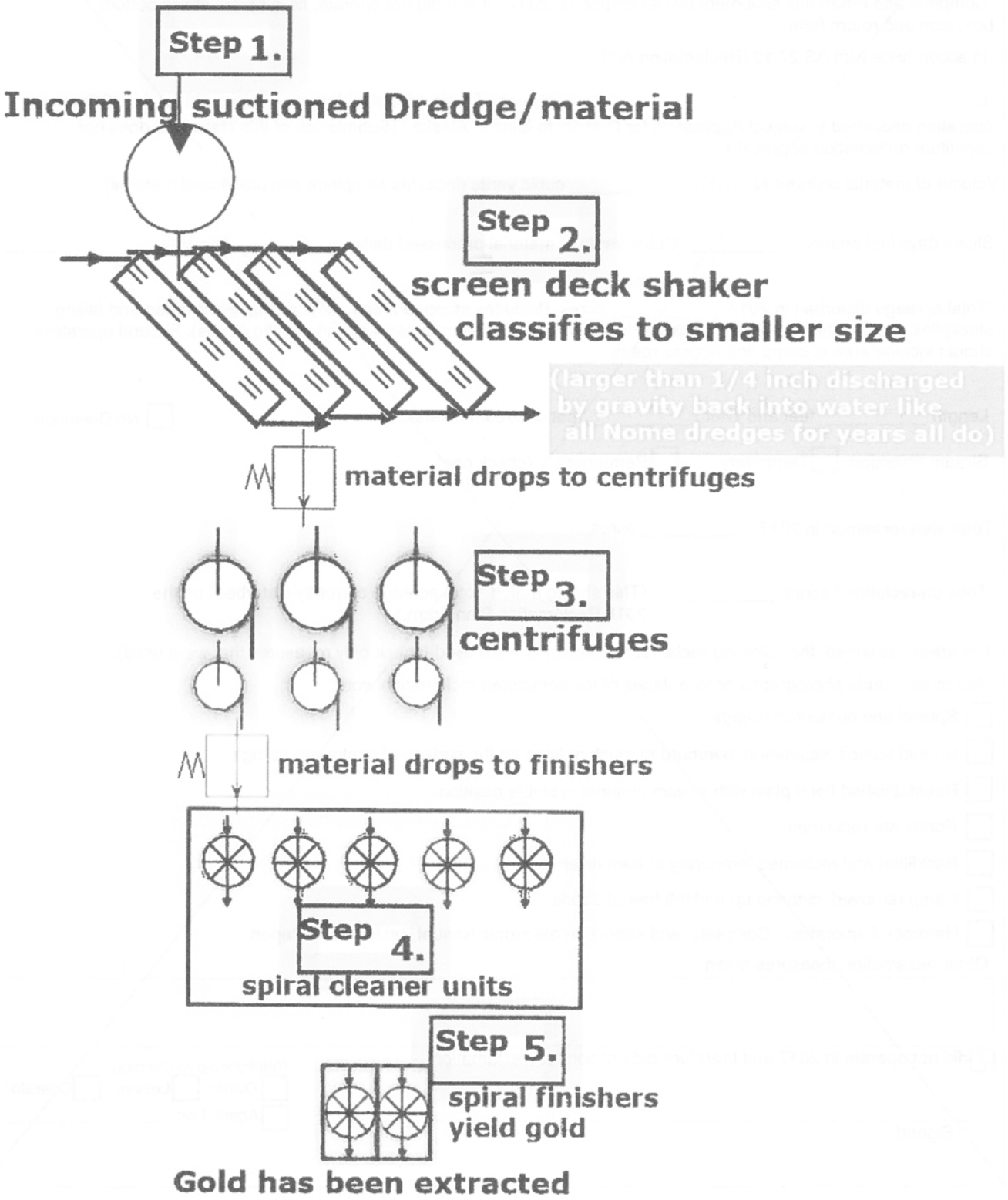
System Curve Table: Degree of Detail required 500

Pressure (PSI)	Pump Head Feet	GPM	Pump HP Required	Head at pump Suction	Discharge Line Velocity	TPH dry solids Production	PUMP RPM
33	65	3000	90	-5.42	11.6	222.3	543
36	71	3500	114	-5.69	13.5	259.3	565
39	77	4000	142	-5.99	15.4	296.4	590
43	84	4500	175	-6.33	17.3	333.4	617
47	93	5000	213	-6.70	19.3	370.5	647
52	102	5500	258	-7.10	21.2	407.5	679
58	113	6000	311	-7.53	23.1	444.6	713
64	124	6500	372	-8.00	25.0	481.6	749
70	137	7000	443	-8.50	27.0	518.7	787

Exhibit 7

Generalized Process Flow Diagram

FLOW THROUGH DIAGRAM OF DREDGED MATERIAL



DEC-002525

Exhibit 8

2018 Sediment Sampling and Drilling Results, Chains of Custody, Oro Industries Processing Results

Exhibit 9- Assay Results

IPOP retrieved an initial, hand-dug sample from the northwest corner of the underwater portion of DSKN 31 on May 7, 2018, and had it analyzed by American Assay Laboratories of Sparks, NV. The results are attached hereto as Exhibit 8A. This test confirmed what IPOP had been told by state regulators: that there was no appreciable mercury present in the area, and enabled IPOP to focus further laboratory work on mineralization tests of commercial interest.

IPOP has heretofore delayed releasing detailed results from its exploration sampling because the of desire to seek out additional potential claims without setting off a "gold rush". IPOP sampled the cores in precisely the locations proposed, as set forth in the map previously provided:

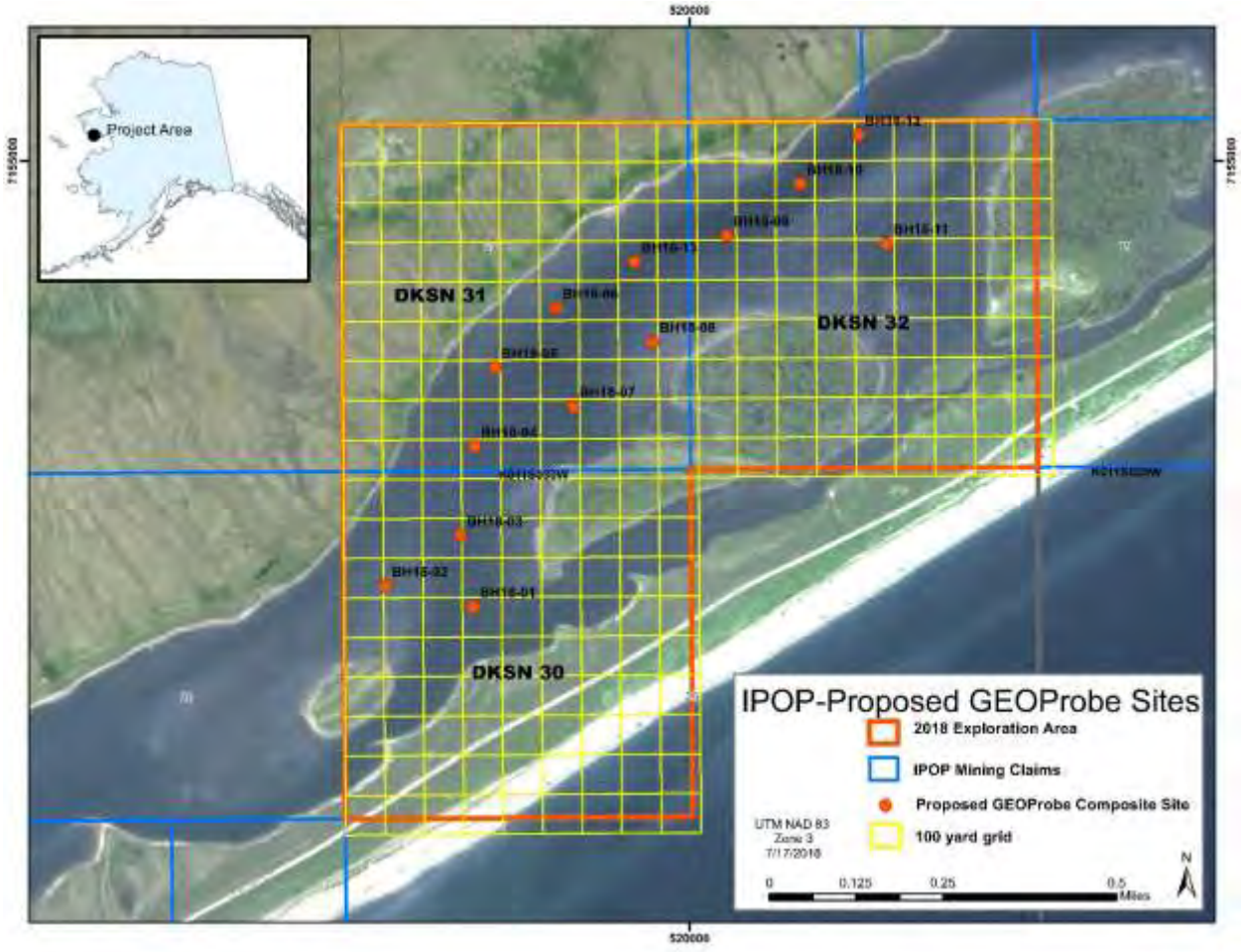


Exhibit 8B shows the date and time thirteen samples were collected, with sample codes, and identifies the person who collected them and sent them to American Assay Laboratories, of Sparks, NV.

Attached as Exhibit 8C is Final Report from American Assay Laboratories. They received the core samples and produced detailed information concerning both the mineral content of thirteen core samples (BH18-01 through -13), and the proportion of sand, silt and clay.[1]

[1] American Assay labs defines "clay" as having particle size less than two microns, "sand" as particle size greater than 63 microns, and "silt" as particle size two to sixty-three microns.

Because the core samples consisted of unconsolidated materials, unlike hard rock core samples, and were also relatively homogeneous, no detailed analysis of the composition by depth layer was conducted. The geologic lessons from the historically-rich Nome beaches demonstrate that the fine gold is widely distributed—no exercise like attempting to identify the location of lode formation is required in this context. What was more important was to confirm the congruence of the mineral composition results with the depositional layers of the gold rich beaches in Nome. More specifically, in Nome the best predictor of gold in the beach sands is the quartz percentage, and the core samples showed a very high percentage of quartz.

IPOP did not ask American Assay Laboratories to prepare detailed information concerning the precise portions of gold within the samples for two reasons. First, gold was obvious and pervasive in the cored samples, to the extent it could be seen through the cored clear plastic liner immediately when the cores were brought back to Nome:

Again, the obvious presence of gold like this comes as no surprise to IPOP, which extensively researched the history and geology of the area. Miners up the nearby rivers produced millions of ounces of gold, and the sediment in the Bonanza Channel comes out of these rivers and other upland gold deposits.

More importantly, IPOP's primary concern, given the generally small size of the gold particles, was utilize the 323 lbs. of cored material in a batch test of IPOP's concentrating equipment, equipment which must be engineered to match the type of placer gold actually encountered.

Accordingly, after the testing by American Assay Laboratories, the samples were transferred under a strict chain of custody to Oro Industries of Placerville, California, who engineered the processing equipment. Ms. Claudia Wise picked up the core samples from the shipper at the American Assay Lab on June 4, 2019, and drove them to Oro Industries, arriving on June 5, 2019. Mr. Paul Clift of Oro Industries signed for the packages and they were unloaded. See Exhibits 8D (receipts) & 8E (photographs)

At this point, the samples were to be put through a large centrifuge; Mr. Clift could not wait to see the results, and began to hand-pan the material. (Exhibit 8F). Some tests to see how quickly the material would settle were run, and the centrifuged concentrate was then fed into the spiral concentrator. Everyone was pleased with the results, which showed significant gold.

The net result was that the concentrators produced a total of seven grams of gold from the 323 lbs. of core samples. (Exhibit 8G.) This is just over 43 grams of gold per ton, and far lower concentrations than this are commercially viable.

EXHIBIT 8A

SP0122408
FINAL REPORT

Multi Element Package

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV USA 89431-5902
Ph.(775) 356-0606
Fax.(775) 356-1413
EMAIL: info@aallabs.com

IPOP LLC

COPIES TO :	Edwin Epstein	CLIENT REFERENCE No:	#1-#2	RECEIVED :	14-May-2018
:		No. SAMPLES :	2	REPORTED :	18-May-2018
:		MAIN SAMPLE TYPE :	ROCK		
:					

COMPANY DISCLAIMER :-
When small samples are submitted, AAL may process the sample at smaller then specified weights to retain some pulp for quality control reassay.
When Values exceed upper limits, AAL will run an Over Range analysis, to establish an accurate value. Additional cost will apply.
Due to USDA Soil Quarantine programs - all foreign and some domestic soil material must be decontaminated by drying @ 125c for 48 hours, which will result in loss of Mercury (Hg).

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project. Nevada State Law NRS 519.130.

ANALYSIS	Wt	Au	150 Wt	150 Au	150 Wt	Au(1)	Au(2)	u Calc	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Fe
METHOD	BRPP2KG	30-ICP	PB30SF	PB30SF	PB30SF	PB30SF	PB30SF	PB30SF	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT
UNIT	kg	ppm	grams	ppm	grams	ppm	gram	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
LOWER LIMIT	0.01	0.003	0.01	0.003	1	0.003	0.003	0.003	0.005	10	0.1	0.001	0.1	0.01	0.005	10	0.01	0.01	0.1	0.01	0.01	0.1	0.01	0.01	0.01	10

ANALYSIS	Ga	Gd	Ge	Hf	Hg	Ho	In	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	P	Pb	Pr	Rb	Re	S	Sb	Sc
METHOD	ICP-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT
UNIT	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
LOWER LIMIT	0.02	0.01	0.01	0.01	0.005	0.01	0.01	10	0.1	0.2	0.01	10	0.2	0.02	10	0.005	0.01	0.1	10	1	0.01	0.02	0.005	10	0.02	0.01

ANALYSIS	Se	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl	Tm	U	V	W	Y	Yb	Zn	Zr	Al2O3	BaO	CaO	Cr2O3	Fe2O3	K2O	MgO	MnO
METHOD	ICP-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	-5A-UT	XRF-WR	XRF-WR	XRF-WR	XRF-WR	XRF-WR	XRF-WR	XRF-WR	XRF-WR
UNIT	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	pct	pct	pct	pct	pct	pct	pct
LOWER LIMIT	0.1	0.01	0.02	0.1	0.01	0.01	0.02	0.005	10	0.003	0.01	0.01	0.1	0.01	0.01	0.01	0.2	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

ANALYSIS	Na2O	P2O5	SiO2	SrO	TiO2	V2O5	LOI
METHOD	XRF-WR	XRF-WR	XRF-WR	XRF-WR	XRF-WR	XRF-WR	LOI
UNIT	pct	pct	pct	pct	pct	pct	pct
LOWER LIMIT	0.01	0.01	0.01	0.01	0.01	0.01	0.01

SIGNATORY

ANALYSIS
Au
ICP
XRF

SP0122408
FINAL REPORT

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV USA 89431-5902
Ph.(775) 356-0606
Fax.(775) 356-1413
EMAIL: AALLABS@NVBELL.NET

	Abbreviation	Definition
Preparation	DIP	Sample Destroyed in Preparation
	DIS	Sample Destroyed in Shipment
	ISS	Insufficient Sample Submitted
	SDI	Sample Diesel Impregnated
	SHI	Sample Hydraulic Impregnated
	SNR	Sample Not Received
Analysis	STD - ??	International Reference Material Standard
	STD - AAL##	AAL generated standard material
	BLANK	AAL Laboratory Silica Blank
	DTF	Data to Follow
	DL	Detection Limit of Method
	< or -	Less Than Lower Detection Limit of Method
	>	Greater than Upper Limit of Method
	N/A	Not Analyzed
	NR	Not Reported
	(R) column	Laboratory repeat weigh, digestion, analysis from original pulp or reject resplit
	D or -D after Sample ID	Client submitted duplicate rig split sample
	-R after Sample ID	Repeat analysis from original pulp reweigh, digestion and analysis
	-X after Sample ID	Repeat analysis from reject resplit, preparation, weigh, digestion and analysis
	ppb	Parts per Billion 0.001 ppm = 1 pp
	ppm	Parts per Million 1 ppm = 1 mg/K
	OPT	Troy Ounces per Short Ton(2,000 lbs)(1 ppm= 0.02917 OPT
	Oz	Troy Ounce = 31.103 grams
	%	Percent 1%=10,000 pp
	g	Grams 1g=0.001 kilogra
	mg	Milligrams 1mg=0.001gram
	Kg	Kilograms 1Kg=1000grams
	lbs	Pounds 1lb=0.454kilogra
Method	FA-PB##	Fire Assay Lead Collection - ## sample weight in gram
	GRAV	Gravimetric (Weighed) finish
	SF	Screen Fire Assay reporting a plus, 2 minus fractions and a head Ca
	+ ###	Plus Fraction (Retained on top of Mesh) ###Screen Siz
	- ###	Minus Fraction (Passed through Mesh) ###Screen Siz
	CN	Cyanide Extraction
	ORE GRADE	2g sample made to 1000ml volumetric for results > upper limit of metho
	Ox-H2SO4 or -HCl	Dilute acid leach for oxide fraction in copper or molybdenum analysis
	QLA	Dilute 10%H2SO4/0.5%Fe2(SO4)3 30C leach for acid soluble copper
	QLT	Dilute 15%H2SO4 30C leach for acid soluble copper
	SAP	Dilute 5%H2SO4/0.5%Fe2(SO4)3 85C leach for acid soluble & chalcocite copper
	D#A	Digestion #=2,3 or 4 Acids
		2A=HCl/HNO3 3A=HCl/HNO3/HClO4 4A=HCl/HNO3/HF/HClO
	HCl	Hydrochloric Acid(37%w/v) Boiling Point 109
	HF	Hydrofluoric Acid(48%w/v) Boiling Point 108C Extreme Health Hazar
	HClO4	Perchloric Acid(69%w/v) Boiling Point 203C Extreme Fire/Explosion Hazar
	HNO3	Nitric Acid(69%w/v) Boiling Point 121
	H2SO4	Sulfuric Acid(98% w/v) Boiling Point 338
	ICP-xB or -xZ	ICP-AES and/or ICP-MS analysis using x=2, 3 or 4 acid digestion
	LiBO2-C	Lithium Metaborate fusion in Carbon crucible
	Na2O2-C	Sodium Peroxide fusion in Carbon crucible
	Na2O2-Zr	Sodium Peroxide fusion in Zirconium crucible
Technique	AAS	Atomic Absorption Spectroscopy
	ICP-AES	Inductively Coupled Plasma Atomic Emission Spectroscop
	ICP-MS	Inductively Coupled Plasma Mass Spectroscop
	RG	Research Grade (Low detection limit ICP-AES
	UT	Ultra Trace (ICP-AES+ICP-MS analyses
	XRF-ED or -WD	X-Ray Flourescence (-ED = Energy Dispersive) (-WD = Wavelength Dispersive
	XRD	X-Ray Diffraction
	ELTRA-I	Carbon & Sulfur infrared detection analyzer inductive heatir
	ELTRA-R	Carbon, Hydrogen & Sulfur infrared detection analyzer resistance furna
	LECO-I	Nitrogen & Oxygen infra red detection analyzer inductive heatir
	MW	Microwave Digestion (-PT is at 1500psig and 300C
	SG-WD or -HP	Specific Gravity-WD=Water Displacement -HP=Helium Pycnometer 1g/cm3=62.4lbs/f

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Rivers of Gold
REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	Wt BRPP2KG 0.01 kg	Au FA-PB30-ICP 0.003 ppm	+150 Wt FA-PB30SF 0.01 grams	+150 Au FA-PB30SF 0.003 ppm	-150 Wt FA-PB30SF 1 grams	-150 Au(1) FA-PB30SF 0.003 ppm	-150 Au(2) FA-PB30SF 0.003 gram	Au Calc FA-PB30SF 0.003 ppm	Ag ICP-5A-UT 0.005 ppm	Al ICP-5A-UT 10 ppm	As ICP-5A-UT 0.1 ppm	Au ICP-5A-UT 0.001 ppm	Ba ICP-5A-UT 0.1 ppm
#1	6.50	0.003	23.06	0.018	771	0.004	0.003	0.004	0.105	41550	4.4	-0.001	240.5
#2	6.20	0.003	24.06	-0.003	705	0.004	0.004	0.004	0.143	42589	6.5	-0.001	278.7
#2-X		0.003	39.39	0.005	783	-0.003	-0.003	-0.003	0.072	40387	8.2	-0.001	249.7
BLANK		-0.003							-0.005	2131	3.1	-0.001	9.5
STD - OxA131		0.065											
STD - CDN-ME-1205									26.663	60658	533.7	0.883	807.6
STD - AAL2010													
STD - OREAS 905									0.536	76466	30.6	0.404	>2000

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Rivers of Gold
REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	Be ICP-5A-UT 0.01 ppm	Bi ICP-5A-UT 0.005 ppm	Ca ICP-5A-UT 10 ppm	Cd ICP-5A-UT 0.01 ppm	Ce ICP-5A-UT 0.01 ppm	Co ICP-5A-UT 0.1 ppm	Cr ICP-5A-UT 0.01 ppm	Cs ICP-5A-UT 0.01 ppm	Cu ICP-5A-UT 0.1 ppm	Dy ICP-5A-UT 0.01 ppm	Er ICP-5A-UT 0.01 ppm	Eu ICP-5A-UT 0.01 ppm	Fe ICP-5A-UT 10 ppm
#1	0.71	0.079	8921	0.02	20.54	13.7	57.97	0.24	20.9	2.59	2.26	0.84	36647
#2	0.80	0.069	9215	0.03	27.15	14.2	76.56	0.26	33.5	2.85	2.31	1.05	47494
#2-X	0.72	0.054	8943	-0.01	23.39	12.8	57.58	0.27	23.5	2.63	2.06	1.02	37985
BLANK	0.04	0.014	96	-0.01	8.76	0.1	2.70	0.02	1.1	0.35	0.35	0.24	330
STD - OxA131													
STD - CDN-ME-1205	0.87	9.167	28061	22.72	33.10	25.6	79.30	0.62	2232.7	3.18	1.96	0.87	64543
STD - AAL2010													
STD - OREAS 905	2.86	6.041	5935	0.30	95.93	16.0	20.25	6.36	1585.9	3.48	1.25	1.34	41754

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Rivers of Gold
REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	Ga ICP-5A-UT 0.02 ppm	Gd ICP-5A-UT 0.01 ppm	Ge ICP-5A-UT 0.01 ppm	Hf ICP-5A-UT 0.01 ppm	Hg ICP-5A-UT 0.005 ppm	Ho ICP-5A-UT 0.01 ppm	In ICP-5A-UT 0.01 ppm	K ICP-5A-UT 10 ppm	La ICP-5A-UT 0.1 ppm	Li ICP-5A-UT 0.2 ppm	Lu ICP-5A-UT 0.01 ppm	Mg ICP-5A-UT 10 ppm	Mn ICP-5A-UT 0.2 ppm
#1	6.85	3.74	-0.01	0.54	0.023	0.27	-0.01	6377	13.4	18.7	0.07	8620	463.3
#2	6.84	4.58	-0.01	1.02	0.021	0.31	0.01	7434	14.3	21.7	0.09	8868	568.1
#2-X	6.30	3.91	-0.01	2.62	0.022	0.32	0.01	6493	13.5	18.5	0.09	8048	474.6
BLANK	1.54	0.20	-0.01	2.14	0.006	0.02	-0.01	1137	3.1	1.3	-0.01	110	1.7
STD - OxA131													
STD - CDN-ME-1205	11.56	5.67	0.02	1.91	0.773	0.47	1.48	12298	18.7	22.2	0.14	12767	839.1
STD - AAL2010													
STD - OREAS 905	25.65	6.89	0.02	7.24	0.038	0.44	0.53	29093	44.9	22.5	0.06	2803	386.7

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
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REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	Mo ICP-5A-UT 0.02 ppm	Na ICP-5A-UT 10 ppm	Nb ICP-5A-UT 0.005 ppm	Nd ICP-5A-UT 0.01 ppm	Ni ICP-5A-UT 0.1 ppm	P ICP-5A-UT 10 ppm	Pb ICP-5A-UT 1 ppm	Pr ICP-5A-UT 0.01 ppm	Rb ICP-5A-UT 0.02 ppm	Re ICP-5A-UT 0.005 ppm	S ICP-5A-UT 10 ppm	Sb ICP-5A-UT 0.02 ppm	Sc ICP-5A-UT 0.01 ppm
#1	2.17	15472	7.188	12.68	25.0	412	7	8.99	19.72	-0.005	2654	0.32	6.97
#2	3.53	15828	6.933	14.11	41.0	515	5	8.95	12.26	-0.005	4138	0.36	7.69
#2-X	2.40	15033	6.526	12.56	24.1	495	6	8.05	21.31	-0.005	3594	0.35	7.06
BLANK	0.27	99	-0.005	2.51	-0.1	-10	-1	2.70	1.35	-0.005	88	0.05	0.22
STD - OxA131													
STD - CDN-ME-1205	74.68	17699	15.647	16.51	172.7	719	1291	2.52	28.24	0.013	15153	23.87	11.16
STD - AAL2010													
STD - OREAS 905	3.50	22418	16.913	36.89	8.4	283	28	11.51	141.56	-0.005	698	1.11	4.81

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Rivers of Gold
REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	Se ICP-5A-UT 0.1 ppm	Sm ICP-5A-UT 0.01 ppm	Sn ICP-5A-UT 0.02 ppm	Sr ICP-5A-UT 0.1 ppm	Ta ICP-5A-UT 0.01 ppm	Tb ICP-5A-UT 0.01 ppm	Te ICP-5A-UT 0.02 ppm	Th ICP-5A-UT 0.005 ppm	Ti ICP-5A-UT 10 ppm	Tl ICP-5A-UT 0.003 ppm	Tm ICP-5A-UT 0.01 ppm	U ICP-5A-UT 0.01 ppm	V ICP-5A-UT 0.1 ppm
#1	-0.1	3.40	1.29	109.1	0.90	3.12	-0.02	2.609	3938	0.056	0.06	0.48	54.4
#2	-0.1	3.01	2.31	114.1	1.24	3.07	-0.02	2.869	3908	0.068	0.08	0.56	54.3
#2-X	-0.1	3.38	1.97	106.7	1.18	3.14	-0.02	3.032	3818	0.072	0.08	0.60	51.6
BLANK	1.1	1.33	0.63	4.3	-0.01	-0.01	-0.02	0.297	121	0.005	-0.01	0.05	1.5
STD - OxA131													
STD - CDN-ME-1205	2.2	4.48	26.51	334.4	1.67	2.34	0.54	4.609	3197	1.808	0.11	1.19	83.0
STD - AAL2010													
STD - OREAS 905	1.4	6.75	4.10	163.2	1.84	0.60	0.07	13.204	1275	0.685	0.07	4.48	-0.1

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Rivers of Gold
REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	W ICP-5A-UT 0.01 ppm	Y ICP-5A-UT 0.01 ppm	Yb ICP-5A-UT 0.01 ppm	Zn ICP-5A-UT 0.2 ppm	Zr ICP-5A-UT 0.1 ppm	Al2O3 XRF-WR 0.01 pct	BaO XRF-WR 0.01 pct	CaO XRF-WR 0.01 pct	Cr2O3 XRF-WR 0.01 pct	Fe2O3 XRF-WR 0.01 pct	K2O XRF-WR 0.01 pct	MgO XRF-WR 0.01 pct	MnO XRF-WR 0.01 pct	Na2O XRF-WR 0.01 pct	P2O5 XRF-WR 0.01 pct	SiO2 XRF-WR 0.01 pct	SrO XRF-WR 0.01 pct
#1	0.74	12.89	1.22	49.5	24.0	7.44	0.04	1.38	0.01	5.25	0.72	1.41	0.06	1.79	0.08	77.04	0.02
#2	1.71	13.68	1.31	48.9	28.8	7.85	0.05	1.43	-0.01	6.69	0.86	1.48	0.07	1.78	0.09	74.00	0.01
#2-X	0.86	13.01	1.23	53.1	25.9	7.35	0.05	1.40	-0.01	5.45	0.75	1.34	0.08	1.70	0.09	75.19	0.01
BLANK	0.02	0.50	0.05	4.5	4.1	0.40	-0.01	0.03	-0.01	0.05	0.11	-0.01	-0.01	-0.01	-0.01	96.37	-0.01
STD - OxA131																	
STD - CDN-ME-1205	19.70	13.35	1.33	3411.8	61.4												
STD - AAL2010						10.20	0.26	6.92	0.03	6.37	3.19	2.99	0.09	0.53	0.23	60.49	0.03
STD - OREAS 905	2.62	15.48	0.68	132.6	242.3												

SP0122408

FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Rivers of Gold
REFERENCE : #1-#2
REPORTED : 18-May-2018

SAMPLES	TiO2 XRF-WR 0.01 pct	V2O5 XRF-WR 0.01 pct	LOI LOI 0.01 pct
#1	0.83	0.01	1.96
#2	0.87	0.02	2.03
#2-X	0.85	0.02	2.21
BLANK	0.04	-0.01	0.35
STD - OxA131			
STD - CDN-ME-1205			
STD - AAL2010	0.46	0.04	8.26
STD - OREAS 905			

EXHIBIT 8B

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 West Chadston Blvd, Las Vegas	Address	

				Notes:	Known Hazards			
Client:	IPOP	Location Name:	Borehole 18-01	N/A	Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Bezin		Radiological		Other	
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling					

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-01 0-4	SD	4/13/19	1334				
2	BH18-01 4-10.5	SD	4/13/19					
3	BH18-01 10.5-14.5	SD	4/13/19					
4	BH18-01 14.5-18	SD	4/13/19					
5	BH18-01 18-22	SD	4/13/19					
6	BH18-01 22-26.5	SD	4/13/19					
7	BH18-01 26.5-31.5	SD	4/13/19	1623				
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Samples Intact	
1	Jeffrey Bezin	4/20/19			Y	N	Y	N
2		5:00 pm			Y	N	Y	N
3	Yvette AAL	6/4 3:48pm	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N
X 4	[signature]	10:17AM						

Receipt
Temperature:

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards			
Client:	IPOP	Location Name:	BH18-02		Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Rizin		Radiological		Other	
Location Code:	Clwm 30, 31, 32	Event Desc:	Core Drilling					

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-02 0-6	SD	4/17/19	1632				
2	BH18-02 6-10	SD	4/17/19					
3	BH18-02 10-14	SD	4/17/19					
4	BH18-02 14-17	SD	4/17/19					
5	BH18-02 17-20	SD	4/17/19					
6	BH18-02 20-23.5	SD	4/17/19	1900				
7								
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on ice		Samples Intact		Receipt: Temperature:
1	Jeffrey Rizin	4/20/19			Y	N	Y	N	
2		5:00pm			Y	N	Y	N	
3	Yvette AAL	6/4 3:48	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	
4	[signature]	10:12 AM 6/5							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 West Charleston Blvd #2-444	Address	

				Notes:	Known Hazards			
Client:	IPOP	Location Name:	BH18-03	Las Vegas, NV	Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological		Other	
Location Code:	Claim 30,31,32	Event Desc:	Core Drilling					

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-03 0-4'	SD	4/14/19	1115				
2	BH18-03 4-10'	SD	"	"				
3	BH18-03 10-14'	SD						
4	BH18-03 14-19'	SD						
5	BH18-03 19-23'	SD						
6	BH18-03 23-26'	SD	↓	1342				
7								
8								

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Sample Condition: Samples Intact		Receipt: Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00pm			Y	N	Y	N	
3	Yvette AAL	6/4 3:48	Claudia Wise &	6/4/19 3:50pm	Y	N	Y	N	
4		6/5 10:13							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 West Charleston Blvd #2-444	Address	

				Notes:	Known Hazards	
Client:	IPOP	Location Name:	BH18-04	Las Vegas, NV	Flammable	Poison
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological	Other
Location Code:	Claim 30,31,32	Event Desc:	Core Drilling			

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-04 0-8.5	SD	4/14/19	1401				
2	BH18-04 8.5-12.5	SD	4/14/19	"				
3	BH18-04 12.5-17	SD	4/14/19	"				
4	BH18-04 17-20.5	SD	4/14/19	"				
5	BH18-04 20.5-23.5	SD	4/14/19	1722				
6								
7								
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Sample Condition: Samples Intact		Receipt Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00pm			Y	N	Y	N	
3	Yvette AAL	6/4 3:48	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	
4	~~[illegible]~~	6/5 10:12am							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444, Las Vegas, NV	Address	

				Notes:	Known Hazards			
Client:	IROP	Location Name:	BH18-05		Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological		Other	
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling					

#	Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment Sample ID, Description	Matrix	Collection Actual Collection Date	Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-05 0-5.5'	SD	4/14/19	1744				
2	BH18-05 5.5-9.5'							
3	BH18-05 9.5-15.5'							
4	BH18-05 15.5-19.5'							
5	BH 18-05 19.5-23.5'							
6	BH 18-05 23.5-28'							
7	BH18-05 28-33.5'			2057				
8								

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on ice		Samples Intact		Receipt: Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00 pm			Y	N	Y	N	
3	Yvette AAL	6/4 3:49	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	
4	~~Jeffrey Rezin~~	6/5 10:12am							

Environmental Chain of Custody Form

Additional Report Recipients			
To	Amerstern Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards			
Client:	IFOP	Location Name:	BH18-06		Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological		Other	
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling					

#	Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment Sample ID, Description	Matrix	Collection Actual Collection Date	Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-06 0-5.5'	SD	4/17/19	1337				
2	BH18-06 5.5-9.5'	SD						
3	BH18-06 9.5-13.5'	SD						
4	BH18-06 13.5-15.5'	SD						
5	BH18-06 15.5-21.5'	SD		1603				
6								
7								
8								

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition Received on Ice		Sample Condition Samples Intact		Receipt Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00pm			Y	N	Y	N	
3			Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	

4 [signature] 6/5 10:17 6/5

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards	
Client:	IPOP	Location Name:	BH18-07		Flammable	Poison
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological	Other
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling			

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-07 0-7'	SD	4/15/19	1032				
2	BH18-07 7-11'	SD						
3	BH18-07 11-15'	SD						
4	BH18-07 15-19'	SD						
5	BH18-07 19-22.5	SD		1301				
6								
7								
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Samples Intact		Receipt: Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00pm			Y	N	Y	N	
3	Yvette AAL	6/4 3:49	ClaudiaWise	6/4/19 3:50pm	Y	N	Y	N	
4	[signature]	6/5 10:19am							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards	
Client:	IDOP	Location Name:	BH18-08		Flammable	Poison
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological	Other
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling			

#	Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-08 0-6'	SD	4/15	1331				
2	BH18-08 6-10'	SD						
3	BH18-08 10-14'	SD						
4	BH18-08 14-18'	SD						
5	BH18-08 18-21.5'	SD						
6	BH18-08 21.5-24.5'	SD		1559				
7								
8								

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Sample Condition: Samples Intact		Receipt: Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00 pm			Y	N	Y	N	
3	Yvette	6/4 3:49	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	
4	[illegible]	6/5 10:12ac							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards			
Client:	IPOP	Location Name:	BH 18-09		Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological		Other	
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling					

#	Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment Sample ID, Description	Matrix	Collection Actual Collection Date	Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH 18-09 0-6'	SD	4/17/19	1031				
2	BH 18-09 6-10'	SD	"	"				
3	BH 18-09 10-14'	SD	"	"				
4	BH 18-09 14-18.5'	SD	"	"				
5	BH 18-09 18.5-21.5'	SD	"	"				
6	BH 18-09 21.5-25.5'	SD	↓	1307				
7								
8								

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Samples Intact		Receipt: Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00pm			Y	N	Y	N	
3	[illegible] AAL	6/4 3:49	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	
4	[illegible]	6/5 10:19							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards			
Client:	IDOP	Location Name:	BH18-10		Flammable		Poison	
Profile:	Sediment Lithology	Collector:	Jeffrey Rezin		Radiological		Other	
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling					

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-10 0-4	SD	4/15/19	1630				
2	BH18-10 4-8	SD						
3	BH18-10 8-12	SD						
4	BH18-10 12-16	SD						
5	BH18-10 16-20	SD						
6	BH18-10 20-28	SD		1427				
7								
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Sample Condition: Samples Intact		Receipt: Temperature:
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	
2		5:00 pm			Y	N	Y	N	
3	[illegible] AAL	6/4 3:41	ClaudiaWise	6/4/19 3:50pm	Y	N	Y	N	
4	[illegible]	6/5 10:12am							

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Lab	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

				Notes:	Known Hazards			
Client:	TPOP	Location Name:	BH 18-11		Flammable		Poison	
Profile:	Sediment lithology	Collector:	Jeffrey Rezin		Radiological		Other	
Location Code:	Claim 30, 31, 32	Event Desc:	Core Drilling					

#	Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment Sample ID, Description	Matrix	Collection Actual Collection Date	Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-11 0-4	SD	4/16/19	0952				
2	BH 18-11 4-8	SD						
3	BH 18-11 8-12	SD						
4	BH 18-11 12-16	SD						
5	BH 18-11 16-19	SD						
6	BH 18-11 19-22	SD						
7	BH 18-11 Slough	SD	↓	1245				
8								

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition Received on Ice		Sample Condition Samples Intact		Receipt
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	Temperature:
2		5:00pm			Y	N	Y	N	
3	Lynette AAL	6/4 3:49	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	

6/5 10:17am

Environmental Chain of Custody Form

Additional Report Recipients			
To	American Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas NV	Address	

Client:	IPOP	Location Name:	BH18-12	Notes:	Known Hazards
Profile:	Sediment Lithology 4	Collector:	Jeffrey Rezin		Flammable / Poison
Location Code:	Claim 30, 31, 38	Event Desc:	Core Drilling		Radiological / Other

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-12 0-5.5'	SD	4/16/20	1322				
2	BH18-12 5.5-8'	SD						
3	BH18-12 8-13.5'	SD						
4	BH18-12 13.5-15.5'	SD						
5	BH18-12 15.5-19.5'	SD						
6	BH18-12 19.5-24.5'	SD		1621				
7								
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Samples Intact	
1	Jeffrey Rezin	4/20/19			Y	N	Y	N
2		5:00 pm			Y	N	Y	N
3	[illegible] AAL	6/4 3:49	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N
4	[signature]	6/5 10:17						

Receipt
Temperature:

Environmental Chain of Custody Form

Additional Report Recipients			
To	Ametsteam Assay Labs	To	
Address	9811 W Charleston Blvd #2-444 Las Vegas, NV	Address	

Client:	IPOP	Location Name:	BH18-13	Notes:	Known Hazards	
Profile:	Sediment lithology	Collector:	Jeffrey Rezin		Flammable	Poison
Location Code:	Claim 32, 31, 32	Event Desc:	Core Drilling		Radiological	Other

#	Sample ID, Description	Matrix	Collection: Actual Collection Date	Collection: Actual Collection Time	Sample Comments	Analyses	Total number of containers	Field Test Results
1	BH18-13 0-5.5'	SD	4/16/19	1702				
2	BH18-13 5.5-9.5'	SD						
3	BH18-13 9.5-13.5'	SD						
4	BH18-13 13.5-17.5'	SD						
5	BH18-13 17.5-21.5'	SD		1900				
6								
7								
8								

Matrix Codes: DW=Drinking Water W=Water WW=Waste Water SO=Soil SL=Solid SD=Sediment

Transfers	Released By	Date/Time	Received By	Date/Time	Sample Condition: Received on Ice		Sample Condition: Samples Intact		Receipt
1	Jeffrey Rezin	4/20/19			Y	N	Y	N	Temperature:
2		5:00pm			Y	N	Y	N	
3	Yvette AAL	6/4 3:50	Claudia Wise	6/4/19 3:50pm	Y	N	Y	N	
4	[illegible]	6/5 10:12am							

EXHIBIT 8C

SP0126278
FINAL REPORT

Multi Element Package

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV USA 89431-5902
Ph.(775) 356-0606
Fax.(775) 356-1413
EMAIL: info@aallabs.com

IPOP LLC

COPIES TO :	Edwin Epstein	CLIENT REFERENCE No:	BH18-01 to BH18-13 COMP	RECEIVED :	29-Apr-2019
:		No. SAMPLES :	13	REPORTED :	15-May-2019
:		MAIN SAMPLE TYPE :	COMPOSITES		
:					

COMPANY DISCLAIMER :-
When small samples are submitted, AAL may process the sample at smaller then specified weights to retain some pulp for quality control reassay.
When Values exceed upper limits, AAL will run an Over Range analysis, to establish an accurate value. Additional cost will apply.
Due to USDA Soil Quarantine programs - all foreign and some domestic soil material must be decontaminated by drying @ 125c for 48 hours, which will result in loss of Mercury (Hg).

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project. Nevada State Law NRS 519.130.

ANALYSIS	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	In	K	La	Li	Mg	Mn	Mo	Na	Nb
METHOD	ICP-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48
UNIT	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
LOWER LIMIT	0.05	100	0.1	5	0.01	0.01	100	0.02	0.1	0.1	0.1	0.1	0.1	100	0.02	0.01	0.01	0.01	100	0.01	0.2	100	5	0.1	100	0.02

ANALYSIS	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr	Al2O3	BaO	CaO	Cr2O3
METHOD	ICP-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	-5AM48	FeOre	FeOre	FeOre	FeOre
UNIT	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	pct	pct	pct	pct
LOWER LIMIT	0.1	10	3	1	0.002	100	0.05	0.01	0.2	0.1	1	0.02	0.01	0.1	10	0.002	0.1	1	0.1	0.1	2	0.1	0.01	0.01	0.01	0.01

ANALYSIS	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SO3	SiO2	SrO	TiO2	V2O5	C	S	LOI	Quartz	ldspar	chlore	covite	alcite	hibole	Sand	Silt	Clay
METHOD	XRF-FUSION	FeOre	FeOre	FeOre	FeOre	FeOre	FeOre	FeOre	FeOre	FeOre	FeOre	TRA-CS	TRA-CS	LOI	nt XRD	nt XRD	nt XRD	nt XRD	nt XRD	nt XRD	action	action	action
UNIT		pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct	PCT	PCT	PCT
LOWER LIMIT	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.003	0.003	0.01	1	1	1	1	1	1	0.01	0.01	0.01

SIGNATORY

ANALYSIS
Au
XRD

SP0126278
FINAL REPORT

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV USA 89431-5902
Ph.(775) 356-0606
Fax.(775) 356-1413
EMAIL: AALLABS@NVBELL.NET

	Abbreviation	Definition
Preparation	DIP	Sample Destroyed in Preparation
	DIS	Sample Destroyed in Shipment
	ISS	Insufficient Sample Submitted
	SDI	Sample Diesel Impregnated
	SHI	Sample Hydraulic Impregnated
	SNR	Sample Not Received
Analysis	STD - ??	International Reference Material Standard
	STD - AAL##	AAL generated standard material
	BLANK	AAL Laboratory Silica Blank
	DTF	Data to Follow
	DL	Detection Limit of Method
	< or -	Less Than Lower Detection Limit of Method
	>	Greater than Upper Limit of Method
	N/A	Not Analyzed
	NR	Not Reported
	(R) column	Laboratory repeat weigh, digestion, analysis from original pulp or reject resplit
	D or -D after Sample ID	Client submitted duplicate rig split sample
	-R after Sample ID	Repeat analysis from original pulp reweigh, digestion and analysis
	-X after Sample ID	Repeat analysis from reject resplit, preparation, weigh, digestion and analysis
	ppb	Parts per Billion 0.001 ppm = 1 ppb
	ppm	Parts per Million 1 ppm = 1 mg/Kg
	OPT	Troy Ounces per Short Ton(2,000 lbs)(1 ppm= 0.02917 OPT
	Oz	Troy Ounce = 31.103 grams
	%	Percent 1%=10,000 ppm
	g	Grams 1g=0.001 kilogram
	mg	Milligrams 1mg=0.001gram
	Kg	Kilograms 1Kg=1000grams
	lbs	Pounds 1lb=0.454kilogram
Method	FA-PB##	Fire Assay Lead Collection - ## sample weight in gram
	GRAV	Gravimetric (Weighed) finish
	SF	Screen Fire Assay reporting a plus, 2 minus fractions and a head Ca
	+ ###	Plus Fraction (Retained on top of Mesh) ###Screen Siz
	- ###	Minus Fraction (Passed through Mesh) ###Screen Siz
	CN	Cyanide Extraction
	ORE GRADE	2g sample made to 1000ml volumetric for results > upper limit of method
	Ox-H2SO4 or -HCl	Dilute acid leach for oxide fraction in copper or molybdenum analysis
	QLA	Dilute 10%H2SO4/0.5%Fe2(SO4)3 30C leach for acid soluble copper
	QLT	Dilute 15%H2SO4 30C leach for acid soluble copper
	SAP	Dilute 5%H2SO4/0.5%Fe2(SO4)3 85C leach for acid soluble & chalcocite copper
	D#A	Digestion #=2,3 or 4 Acids
		2A=HCl/HNO3 3A=HCl/HNO3/HClO4 4A=HCl/HNO3/HF/HClO
	HCl	Hydrochloric Acid(37%w/v) Boiling Point 109
	HF	Hydrofluoric Acid(48%w/v) Boiling Point 108C Extreme Health Hazar
	HClO4	Perchloric Acid(69%w/v) Boiling Point 203C Extreme Fire/Explosion Hazar
	HNO3	Nitric Acid(69%w/v) Boiling Point 121
	H2SO4	Sulfuric Acid(98% w/v) Boiling Point 338
	ICP-xB or -xZ	ICP-AES and/or ICP-MS analysis using x=2, 3 or 4 acid digestion
	LiBO2-C	Lithium Metaborate fusion in Carbon crucible
	Na2O2-C	Sodium Peroxide fusion in Carbon crucible
	Na2O2-Zr	Sodium Peroxide fusion in Zirconium crucible
Technique	AAS	Atomic Absorption Spectroscopy
	ICP-AES	Inductively Coupled Plasma Atomic Emission Spectroscopy
	ICP-MS	Inductively Coupled Plasma Mass Spectroscopy
	RG	Research Grade (Low detection limit ICP-AES
	UT	Ultra Trace (ICP-AES+ICP-MS analyses
	XRF-ED or -WD	X-Ray Flourescence (-ED = Energy Dispersive) (-WD = Wavelength Dispersive
	XRD	X-Ray Diffraction
	ELTRA-I	Carbon & Sulfur infrared detection analyzer inductive heating
	ELTRA-R	Carbon, Hydrogen & Sulfur infrared detection analyzer resistance furnace
	LECO-I	Nitrogen & Oxygen infra red detection analyzer inductive heating
	MW	Microwave Digestion (-PT is at 1500psig and 300C
	SG-WD or -HP	Specific Gravity-WD=Water Displacement -HP=Helium Pycnometer 1g/cm3=62.4lbs/f

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel coring
REFERENCE : BH18-01 to BH18-13 COMP
REPORTED : 15-May-2019

SAMPLES	Ag ICP-5AM48 0.05 ppm	Al ICP-5AM48 100 ppm	As ICP-5AM48 0.1 ppm	Ba ICP-5AM48 5 ppm	Be ICP-5AM48 0.01 ppm	Bi ICP-5AM48 0.01 ppm	Ca ICP-5AM48 100 ppm	Cd ICP-5AM48 0.02 ppm	Ce ICP-5AM48 0.1 ppm	Co ICP-5AM48 0.1 ppm	Cr ICP-5AM48 0.1 ppm	Cs ICP-5AM48 0.1 ppm	Cu ICP-5AM48 0.1 ppm
BH18-01 COMP	0.06	45757	7.5	319	0.83	0.10	33599	-0.02	32.4	13.0	579.7	2.2	17.0
BH18-02 COMP	-0.05	35651	5.4	188	0.64	0.05	33464	-0.02	22.9	10.5	623.8	1.2	10.8
BH18-03 COMP	-0.05	40359	7.9	264	0.68	0.05	35281	-0.02	28.5	12.1	696.7	1.6	13.0
BH18-04 COMP	-0.05	47219	9.7	329	0.86	0.06	26952	-0.02	32.8	15.1	847.5	2.3	18.0
BH18-05 COMP	0.07	52408	9.4	308	0.93	0.09	27100	0.05	38.5	18.2	647.3	2.5	23.0
BH18-06 COMP	0.06	44364	7.1	272	0.76	0.05	26361	-0.02	28.8	13.5	505.1	1.9	13.2
BH18-06 COMP-X	-0.05	43080	7.5	267	0.77	0.05	26049	-0.02	29.7	13.3	489.8	1.9	13.1
BH18-07 COMP	-0.05	43335	8.3	257	1.01	0.06	24457	-0.02	29.6	12.5	543.2	1.9	13.6
BH18-08 COMP	-0.05	43575	9.7	285	0.74	0.05	11852	-0.02	30.1	13.5	1107.4	1.9	15.7
BH18-09 COMP	-0.05	51037	5.6	285	0.86	0.07	21816	0.06	36.8	19.5	480.5	2.2	20.9
BLANK	0.06	1938	-0.1	6	0.03	-0.01	-100	-0.02	9.7	0.2	2.9	0.1	0.8
BH18-10 COMP	0.05	52634	9.5	329	0.93	0.07	23188	0.05	37.3	18.6	748.7	2.4	23.2
BH18-11 COMP	0.06	45937	13.0	263	0.77	0.04	13475	-0.02	31.1	15.3	669.6	1.8	14.6
BH18-12 COMP	-0.05	55085	6.1	322	0.98	0.07	17251	0.07	40.0	18.4	553.1	2.4	23.3
BH18-12 COMP-X	-0.05	54041	6.1	320	0.96	0.08	16903	0.02	38.5	18.6	541.0	2.5	22.5
BH18-13 COMP	0.09	43401	4.5	253	0.71	0.04	27168	-0.02	29.6	14.1	431.1	1.5	13.4
STD - OREAS906													
STD - KZK-1													
STD - CDN-ME-1205	26.90	60010	1338.1	781	0.74	9.65	28495	18.31	33.9	22.7	72.0	1.8	2228.5
STD - AAL2010	97.68	53658	1045.1	1856	1.37	665.39	46584	3.31	50.7	25.3	149.1	29.4	2157.6
STD - OREAS905	0.52	73476	32.7	2636	2.52	5.25	6072	0.06	92.0	15.0	19.8	7.1	1542.7

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel co
REFERENCE : BH18-01 to BH18-13
REPORTED : 15-May-2019

SAMPLES	Fe ICP-5AM48 100 ppm	Ga ICP-5AM48 0.02 ppm	Ge ICP-5AM48 0.01 ppm	Hf ICP-5AM48 0.01 ppm	In ICP-5AM48 0.01 ppm	K ICP-5AM48 100 ppm	La ICP-5AM48 0.01 ppm	Li ICP-5AM48 0.2 ppm	Mg ICP-5AM48 100 ppm	Mn ICP-5AM48 5 ppm	Mo ICP-5AM48 0.1 ppm	Na ICP-5AM48 100 ppm	Nb ICP-5AM48 0.02 ppm
BH18-01 COMP	31343	10.34	0.04	0.55	0.05	9957	16.60	22.9	10767	505	2.2	13847	7.07
BH18-02 COMP	25231	7.44	0.03	0.32	0.03	6170	11.95	14.8	7604	465	2.0	12790	5.72
BH18-03 COMP	29760	8.59	0.04	0.42	0.03	7714	14.60	17.8	8870	549	2.0	12935	6.96
BH18-04 COMP	34711	10.71	0.03	0.59	0.04	10408	16.60	24.8	11694	523	2.8	14313	7.78
BH18-05 COMP	40865	12.69	0.05	0.54	0.06	10988	19.22	26.6	13334	641	2.0	13803	8.72
BH18-06 COMP	30513	9.97	0.04	0.43	0.04	8527	14.74	21.5	10547	510	1.9	13574	6.80
BH18-06 COMP-X	29411	9.72	0.04	0.44	0.04	8336	15.02	20.9	10361	500	2.0	13367	6.64
BH18-07 COMP	29377	9.71	0.03	0.49	0.04	8726	15.35	20.1	10321	486	2.0	14367	6.67
BH18-08 COMP	33180	9.55	0.04	0.61	0.04	8258	15.11	20.0	9304	436	3.0	15704	7.31
BH18-09 COMP	40884	12.29	0.04	0.48	0.05	9761	18.52	25.5	13420	644	1.7	14477	8.48
BLANK	525	0.44	-0.01	0.07	-0.01	782	3.17	0.7	-100	-5	0.5	151	0.20
BH18-10 COMP	41377	12.38	0.04	0.51	0.05	10635	18.79	27.4	13557	595	2.5	13345	7.61
BH18-11 COMP	33033	9.89	0.03	0.54	0.04	8712	15.85	21.6	10204	476	2.1	16403	7.35
BH18-12 COMP	39530	11.91	0.04	0.50	0.05	11465	19.75	28.5	13929	581	1.9	15335	6.92
BH18-12 COMP-X	40235	12.24	0.03	0.52	0.05	11147	19.20	27.4	13723	573	2.0	14837	7.26
BH18-13 COMP	30336	9.27	0.04	0.40	0.04	7417	14.67	19.2	10067	523	1.6	12273	6.54
STD - OREAS906													
STD - KZK-1													
STD - CDN-ME-1205	64528	14.33	0.05	1.34	1.81	12177	17.49	20.8	13240	821	80.3	17630	14.60
STD - AAL2010	43150	14.56	0.11	1.90	0.86	22968	28.80	33.5	17893	649	463.9	4893	11.55
STD - OREAS905	41619	24.53	0.08	6.81	0.70	29352	43.56	20.9	2932	384	3.7	23238	17.78

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel co
REFERENCE : BH18-01 to BH18-13
REPORTED : 15-May-2019

SAMPLES	Ni ICP-5AM48 0.1 ppm	P ICP-5AM48 10 ppm	Pb ICP-5AM48 3 ppm	Rb ICP-5AM48 1 ppm	Re ICP-5AM48 0.002 ppm	S ICP-5AM48 100 ppm	Sb ICP-5AM48 0.05 ppm	Sc ICP-5AM48 0.01 ppm	Se ICP-5AM48 0.2 ppm	Sn ICP-5AM48 0.1 ppm	Sr ICP-5AM48 1 ppm	Ta ICP-5AM48 0.02 ppm	Te ICP-5AM48 0.01 ppm
BH18-01 COMP	31.6	606	111	49	0.002	2487	0.89	8.87	-0.2	1.7	203	-0.02	-0.01
BH18-02 COMP	27.2	481	75	32	-0.002	688	0.78	6.62	-0.2	1.1	203	-0.02	-0.01
BH18-03 COMP	30.6	557	39	37	-0.002	1478	0.72	7.78	-0.2	1.3	212	-0.02	-0.01
BH18-04 COMP	39.2	641	45	50	-0.002	2868	0.96	9.08	-0.2	1.5	192	-0.02	0.01
BH18-05 COMP	42.0	732	21	54	-0.002	1031	0.87	11.22	-0.2	1.7	211	-0.02	0.03
BH18-06 COMP	33.2	574	61	43	-0.002	1372	0.81	8.51	-0.2	1.4	186	-0.02	-0.01
BH18-06 COMP-X	32.7	550	60	41	-0.002	1356	0.82	8.40	-0.2	1.3	180	-0.02	0.01
BH18-07 COMP	32.8	578	16	44	-0.002	1865	0.72	8.19	-0.2	1.4	166	-0.02	-0.01
BH18-08 COMP	38.6	602	25	39	0.002	3514	0.86	8.12	-0.2	1.4	129	-0.02	-0.01
BH18-09 COMP	40.9	762	23	47	0.002	932	0.85	12.15	-0.2	1.7	189	0.06	0.01
BLANK	0.4	18	-3	2	-0.002	-100	0.18	0.30	-0.2	-0.1	4	-0.02	-0.01
BH18-10 COMP	47.9	727	20	52	-0.002	1238	0.94	11.06	0.3	1.6	194	-0.02	0.01
BH18-11 COMP	35.9	618	18	39	-0.002	2874	0.77	9.08	-0.2	1.4	139	-0.02	-0.01
BH18-12 COMP	47.2	764	17	50	-0.002	1061	0.82	11.87	-0.2	1.6	163	-0.02	-0.01
BH18-12 COMP-X	46.6	747	17	53	-0.002	1036	0.84	11.62	-0.2	1.7	158	-0.02	0.02
BH18-13 COMP	29.9	616	13	34	-0.002	520	0.74	8.63	-0.2	1.2	193	0.13	-0.01
STD - OREAS906													
STD - KZK-1													
STD - CDN-ME-1205	191.3	781	1314	43	0.042	16009	23.89	10.79	3.7	14.8	348	0.54	0.57
STD - AAL2010	173.8	1243	1882	135	0.163	15576	53.09	7.97	15.6	26.2	223	1.22	7.22
STD - OREAS905	10.3	311	32	148	-0.002	726	2.10	4.52	2.4	4.1	162	4.03	0.07

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel co
REFERENCE : BH18-01 to BH18-13
REPORTED : 15-May-2019

SAMPLES	Th ICP-5AM48 0.1 ppm	Ti ICP-5AM48 10 ppm	Tl ICP-5AM48 0.002 ppm	U ICP-5AM48 0.1 ppm	V ICP-5AM48 1 ppm	W ICP-5AM48 0.1 ppm	Y ICP-5AM48 0.1 ppm	Zn ICP-5AM48 2 ppm	Zr ICP-5AM48 0.1 ppm	Al2O3 XRF-FUSION FeOre 0.01 pct	BaO XRF-FUSION FeOre 0.01 pct
BH18-01 COMP	4.6	3140	0.293	1.2	73	0.7	14.2	46	26.3	8.31	0.03
BH18-02 COMP	3.3	2863	0.202	0.8	56	0.7	11.8	33	19.7	6.42	0.02
BH18-03 COMP	3.8	3264	0.229	1.0	66	0.6	14.0	37	21.2	7.24	-0.01
BH18-04 COMP	4.6	3650	0.298	1.2	81	0.6	14.8	52	30.3	8.61	0.02
BH18-05 COMP	5.3	4156	0.298	1.3	93	0.8	17.9	56	30.0	9.72	0.04
BH18-06 COMP	4.2	3221	0.247	1.1	75	0.5	13.8	47	22.7	7.91	0.02
BH18-06 COMP-X	4.1	3128	0.249	1.1	75	0.5	13.6	46	23.0	8.03	0.01
BH18-07 COMP	4.5	3193	0.255	1.2	70	0.8	13.4	44	21.9	7.88	0.04
BH18-08 COMP	4.1	3375	0.251	1.2	71	0.6	13.8	45	26.9	8.09	0.03
BH18-09 COMP	5.0	4852	0.257	1.2	105	0.6	18.2	60	24.2	9.56	0.03
BLANK	0.9	109	0.015	0.2	2	-0.1	0.4	-2	3.1	0.26	-0.01
BH18-10 COMP	5.3	3914	0.283	1.5	99	0.6	17.0	58	26.9	9.80	0.03
BH18-11 COMP	4.1	3832	0.244	1.0	82	0.5	15.0	49	25.6	8.40	0.02
BH18-12 COMP	5.2	3964	0.286	1.3	100	0.6	18.1	62	29.0	10.06	0.04
BH18-12 COMP-X	5.3	4014	0.299	1.3	98	0.6	18.0	62	29.1	10.31	0.04
BH18-13 COMP	3.8	3571	0.199	1.0	75	0.5	14.4	44	21.9	7.78	-0.01
STD - OREAS906										14.18	0.27
STD - KZK-1											
STD - CDN-ME-1205	3.9	2961	1.921	1.4	98	14.7	12.1	3433	58.0		
STD - AAL2010	9.7	2221	4.314	10.9	154	51.5	16.7	407	52.8		
STD - OREAS905	14.9	1207	0.777	5.0	9	2.9	13.8	131	230.1		

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel co
REFERENCE : BH18-01 to BH18-13
REPORTED : 15-May-2019

	CaO		Cr2O3		Fe2O3		K2O		MgO		MnO		Na2O		P2O5	
	XRF-FUSION	FeOre	XRF-FUSION	FeOre	XRF-FUSION	FeOre	XRF-FUSION	FeOre	XRF-FUSION	FeOre	XRF-FUSION	FeOre	XRF-FUSION	FeOre	XRF-FUSION	FeOre
	0.01		0.01		0.01		0.01		0.01		0.01		0.01		0.01	
SAMPLES	pct		pct		pct		pct		pct		pct		pct		pct	
BH18-01 COMP	4.52		0.10		4.25		1.05		1.72		0.09		1.62		0.10	
BH18-02 COMP	4.46		0.10		3.38		0.65		1.19		0.08		1.55		0.08	
BH18-03 COMP	4.67		0.11		3.97		0.81		1.39		0.09		1.58		0.09	
BH18-04 COMP	3.60		0.13		4.76		1.09		1.86		0.08		1.73		0.11	
BH18-05 COMP	3.68		0.10		5.54		1.15		2.15		0.10		1.68		0.13	
BH18-06 COMP	3.72		0.08		4.13		0.89		1.74		0.09		1.63		0.10	
BH18-06 COMP-X	3.57		0.08		4.17		0.91		1.66		0.09		1.65		0.09	
BH18-07 COMP	3.29		0.09		4.06		0.91		1.62		0.08		1.71		0.10	
BH18-08 COMP	1.61		0.18		4.53		0.86		1.48		0.08		1.86		0.10	
BH18-09 COMP	2.97		0.07		5.61		1.03		2.13		0.10		1.70		0.13	
BLANK	-0.01		-0.01		0.10		0.09		-0.01		0.02		-0.01		-0.01	
BH18-10 COMP	3.16		0.12		5.66		1.13		2.18		0.09		1.68		0.13	
BH18-11 COMP	1.83		0.11		4.50		0.90		1.63		0.08		1.90		0.10	
BH18-12 COMP	2.31		0.08		5.53		1.20		2.20		0.08		1.84		0.13	
BH18-12 COMP-X	2.34		0.08		5.56		1.21		2.19		0.09		1.78		0.13	
BH18-13 COMP	3.66		0.06		4.17		0.77		1.57		0.08		1.56		0.10	
STD - OREAS906	0.81		-0.01		7.96		3.36		0.42		0.07		3.00		0.05	
STD - KZK-1																
STD - CDN-ME-1205																
STD - AAL2010																
STD - OREAS905																

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel co
REFERENCE : BH18-01 to BH18-13
REPORTED : 15-May-2019

	SO3	SiO2	SrO	TiO2	V2O5	C	S	LOI	Quartz	Feldspar
	XRF-FUSION FeOre	XRF-FUSION FeOre	XRF-FUSION FeOre	XRF-FUSION FeOre	XRF-FUSION FeOre	ELTRA-CS	ELTRA-CS	LOI	Quant XRD	Quant XRD
	0.01	0.01	0.01	0.01	0.01	0.003	0.003	0.01	1	1
SAMPLES	pct	pct	pct	pct	pct	pct	pct	pct	pct	pct
BH18-01 COMP	0.49	71.86	0.02	0.70	0.02	1.356	0.193	5.78	37	29
BH18-02 COMP	0.10	78.08	0.02	0.61	-0.01	0.951	0.053	4.09	45	17
BH18-03 COMP	0.26	74.11	0.02	0.71	-0.01	1.121	0.116	4.67	37	20
BH18-04 COMP	0.58	73.02	0.02	0.77	0.01	0.993	0.219	4.63	48	21
BH18-05 COMP	0.18	70.58	0.02	0.94	0.02	0.768	0.080	4.21	46	14
BH18-06 COMP	0.24	75.11	0.02	0.73	0.01	0.836	0.104	3.96	46	22
BH18-06 COMP-X	0.23	76.28	0.02	0.71	0.01	0.844	0.106	3.94	45	26
BH18-07 COMP	0.35	75.49	0.02	0.69	0.02	0.841	0.145	3.76	52	26
BH18-08 COMP	0.73	77.59	0.02	0.73	0.02	0.692	..267	2.91	47	25
BH18-09 COMP	0.15	72.64	0.02	1.01	0.02	0.429	0.075	3.08	47	24
BLANK	-0.01	99.41	-0.01	0.03	-0.01	0.007	0.008	0.25	100	
BH18-10 COMP	0.21	71.18	0.02	0.90	0.03	0.733	0.097	4.17	43	18
BH18-11 COMP	0.58	77.34	0.01	0.82	0.02	0.535	0.221	3.11	52	25
BH18-12 COMP	0.17	72.14	0.02	0.90	0.02	0.470	0.080	3.47	38	28
BH18-12 COMP-X	0.17	72.73	0.02	0.90	0.02	0.473	0.079	3.46	42	13
BH18-13 COMP	0.06	76.04	0.02	0.75	0.02	0.810	0.039	3.80	44	20
STD - OREAS906	0.04	66.41	0.02	0.18	-0.01			2.58		
STD - KZK-1						0.998	0.793			
STD - CDN-ME-1205										
STD - AAL2010										
STD - OREAS905										

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FINAL REPORT

CLIENT : IPOP LLC
PROJECT : Bonanza Channel co
REFERENCE : BH18-01 to BH18-13
REPORTED : 15-May-2019

SAMPLES	Clinochlore Quant XRD 1 pct	Muscovite Quant XRD 1 pct	Calcite Quant XRD 1 pct	Amphibole Quant XRD 1 pct	Sand Extraction Size 0.01 PCT	Silt Extraction Size 0.01 PCT	Clay Extraction 0.01 PCT
BH18-01 COMP	6	23	1	3	82.03	12.75	5.22
BH18-02 COMP	4	30	1	2	94.58	3.05	2.37
BH18-03 COMP	5	35	1	1	89.25	6.09	4.66
BH18-04 COMP	8	20	1	2	77.70	16.55	5.75
BH18-05 COMP	10	26	1	3	72.14	21.32	6.54
BH18-06 COMP	6	23	1	1	83.75	11.42	4.82
BH18-06 COMP-X	5	22	1	2	85.77	9.54	4.69
BH18-07 COMP	8	12	2	3	83.26	11.13	5.61
BH18-08 COMP	7	11	2	8	81.37	13.66	4.97
BH18-09 COMP	9	16		4	80.42	14.46	5.11
BLANK					6.09	84.27	9.65
BH18-10 COMP	12	23	1	3	77.63	18.01	4.36
BH18-11 COMP	8	13		2	82.24	14.12	3.64
BH18-12 COMP	7	25		2	72.33	22.06	5.60
BH18-12 COMP-X	7	36		2	74.59	17.70	7.71
BH18-13 COMP	6	28	1	2	84.32	12.14	3.55
STD - OREAS906							
STD - KZK-1							
STD - CDN-ME-1205							
STD - AAL2010							
STD - OREAS905							

EXHIBIT 8D

DATE: 6.03.19 **1506/Warehouse/Prep/Client**

COMPANY: IPOP LLC (BONANZA)

PICK-UP BY: Claudia Wise **DATE:** 6/4/19 3:50pm

SHIPPED VIA: _____ **DATE:** _____

DELIVERED BY: X Claudia Wise **DATE:** 6/5/19 10:18 AM

EMPLOYEE SIGNATURE: ~~X~~ [signature] 6/5/19 10:18AM

PULPS, SPLIT PULPS, CORE REJECTS, REJECTS COMPOSITIES, DISPOSAL

JOB NUMBERS:

****

☐ SEE ATTACHED

126278

CLIENT: X Claudia Wise **DATE:** 6-4-19

AAL: [signature] **DATE:** 6.03.19

DATE: 6.3.19 **1506/Warehouse/Prep/Client**

COMPANY: IPOP LLC (BONANZA)

PICK-UP BY: Claudia Wise **DATE:** 6/4/19 3:50pm

SHIPPED VIA: _____ **DATE:** _____

DELIVERED BY: Claudia Wise **DATE:** 6/5/19 10:18 am

EMPLOYEE SIGNATURE: [signature] 6/5/19 10:18am

PULPS, SPLIT PULPS, CORE REJECTS, REJECTS COMPOSITIES, DISPOSAL

JOB NUMBERS:

****

☒ SEE ATTACHED

CLIENT: Claudia Wise **DATE:** 6-4-19

AAL: [signature] **DATE:** 6.3.19

SP0126279,IPOP LLC,Bonanza Channel coring,BH18 COMP,BH18-COMP +50 (1),BH18-COMP -230 (4),4/29/2019,1 of 1,,05/01/19

SP0126278,IPOP LLC,Bonanza Channel coring,BH18-01 to BH18-13 COMP,BH18-01 COMP (1),BH18-13 COMP (13),4/29/2019,1 of 1,,05/03/19

SP0126277,IPOP LLC,Bonanza Channel coring,BH18-01 0-4' to BH18-13 17.5-21.5',BH18-01 0-4 (1),BH18-13 0-5.5 (73),4/29/2019,1 of 1,,05/02/19

EXHIBIT 8E

Chain of Custody Proof
Sparks Nevada, AALabs.

BOXES ARE SEALED AND OPENED BY ORO INDUSTRIES

CORES ARRIVE

LAUDIA WISE

Chain of Custody Proof
Oro Industries Arrival, Paul Clift Signs

BOXES ARE SEALED AND OPENED BY ORO INDUSTRIES

DAVID, JOE GREENE AND CLAUDIA

JOE CLAUDIA WITH PAUL CLIFT
CHAIN OF CUSTODY PAPERS

PAUL CLIFT TAKING CUSTODY

PAUL SIGNING FOR SAMPLES DAVID AND CLAUDIA OBSERVE

READY TO UNLOAD OVER 300 LBS. OF CORES

UNLOAD SAMPLES START AT ORO INDUSTRIES

EXHIBIT 8F

GETTING READY TO OPEN SEALED BOXES CORES

DAVID MAKING
NOTATIONS ON SAMPLES
ANALYSIS CONTROL SHEET

PROCESSING STARTS WITH LARGE CENTRIFUGE

NOTE SMALL SIZE MATERIAL

DAVID WATCHES PAUL START EXTRACTION OF GOLD

DAVID HANDS ON EXAMINATION

AN EXCITED PAUL PANS FOR GOLD IMMEDIATELY

PAUL HAND PANNING MATERIAL 1

PAUL TESTS TURBIDITY OF MATERIAL STARTING HERE-PART 1 OF 2

PAUL JUST “SUPER SHOOK” THE MATERIAL

PAUL SEES ZERO TURBIDITY ISSUES- VERY FAST SETTLING MATERIAL

MATERIAL SETTLED OUT PART 2 OF 2

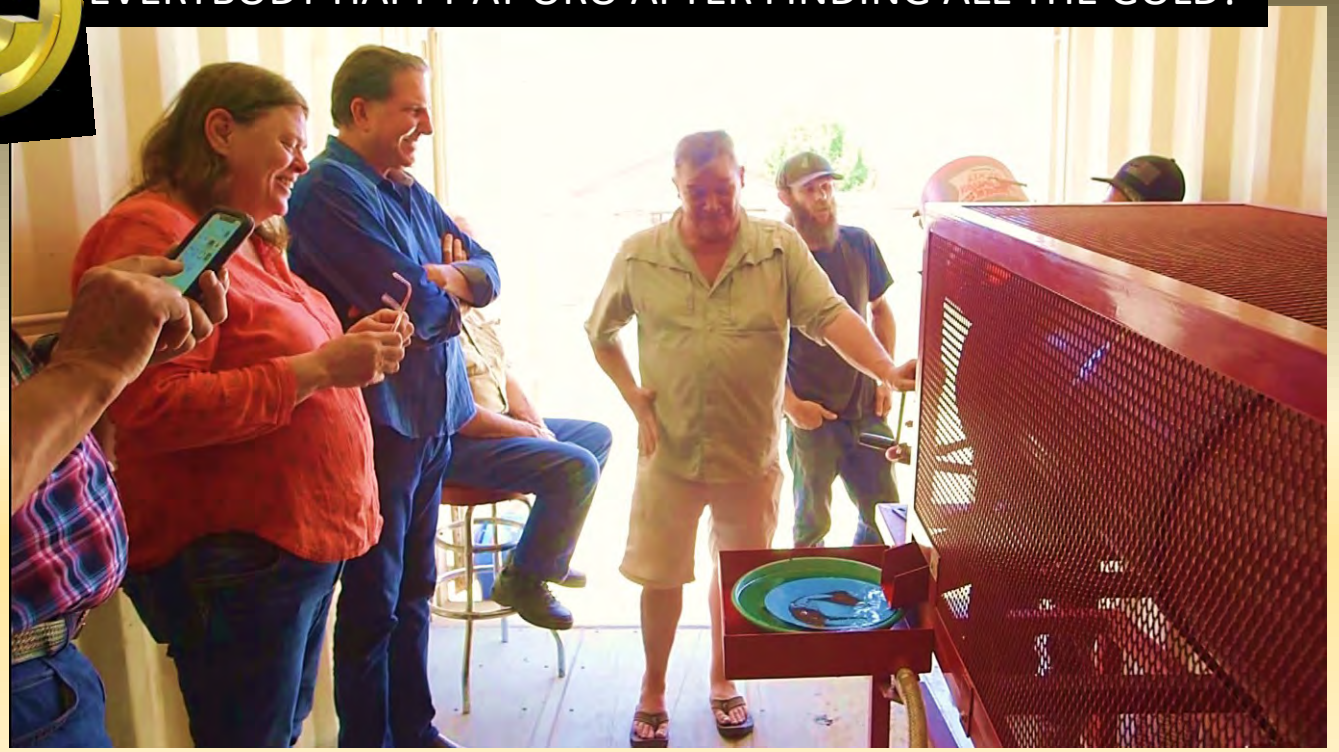
PAUL IS CURIOUS WANTS TO PAN AGAIN

RUNNING THE SPIRAL AT ORO

RUNNING THE GOLD RICH CORE SAMPLES; PART OF THE 323

AT ORO POURING IN THE “SECOND” BUCKET

EVERYBODY HAPPY AT ORO AFTER FINDING ALL THE GOLD!




From just one of your pans
This a fact.
David sao marcos

EXHIBIT 8G

ORO INDUSTRIES

" Your ore is our business "

Date: November 1, 2019

To Whom it May Concern:

Oro Industries received on June 5, 2019 approximately 323 pounds of core samples delivered from IPOP LLC. We ran this material through a centrifuge and then a spiral concentrator of the same type IPOP intends to use in its Alaska dredging and processing operations as a batch test to confirm that our design for the equipment was consistent with the material to be processed in Alaska.

This process recovered approximately seven grams of gold from the 323 pound sample. We were all very gratified because the process had worked well and the amount of gold recovered was very rich.

Sincerely,

Paul Clift / CEO

Oro Industries Inc.

1203 F St. Marysville, Ca. 95901

paul@oro-industries.com
ph - 530-741-3800

Exhibit 9

Safety Sound Conductivity and Temperature Measurements

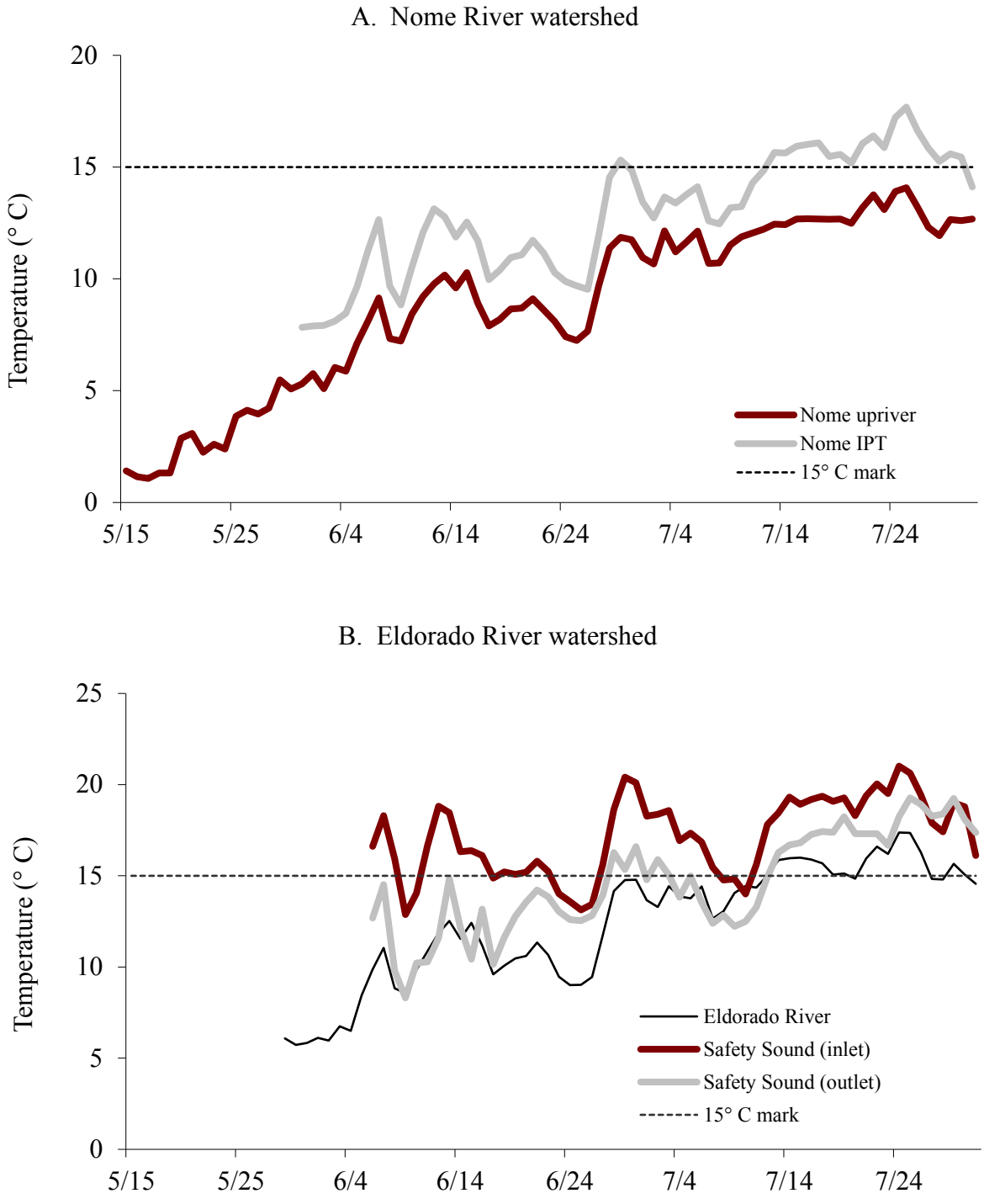


Figure 10. Mean daily temperature from continuous recorders in the (A) Nome River, and (B) Eldorado River watersheds, summer 2004. Dashed line shows 15° C for reference. Data for Nome River (upriver site) and Eldorado River from Kroeker and Dunmall (2005).

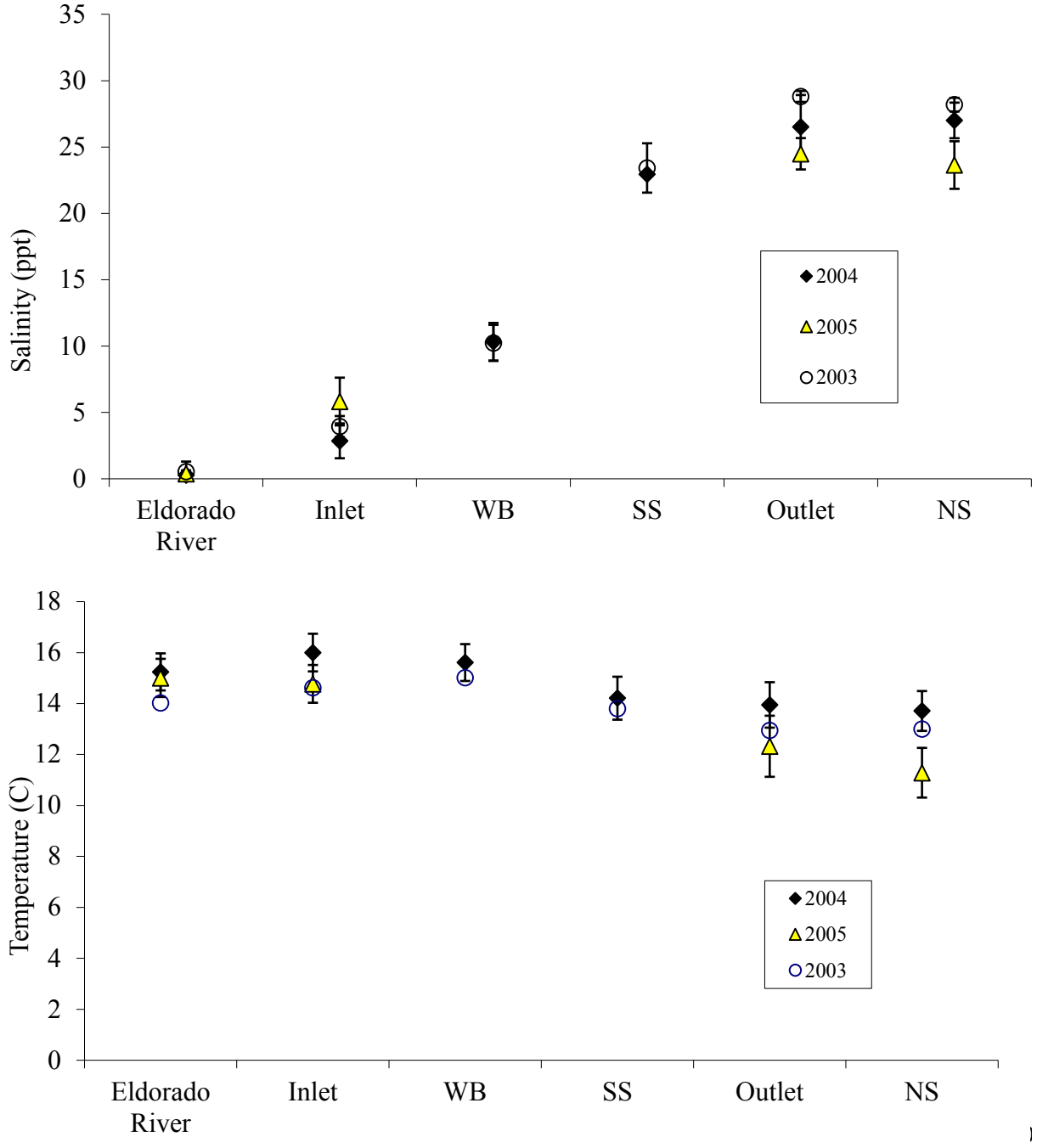


Figure 11. Mean water temperature and salinity throughout Safety Sound, 2003-2005. Sites listed from upstream to downstream. Vertical lines are 1 SE.

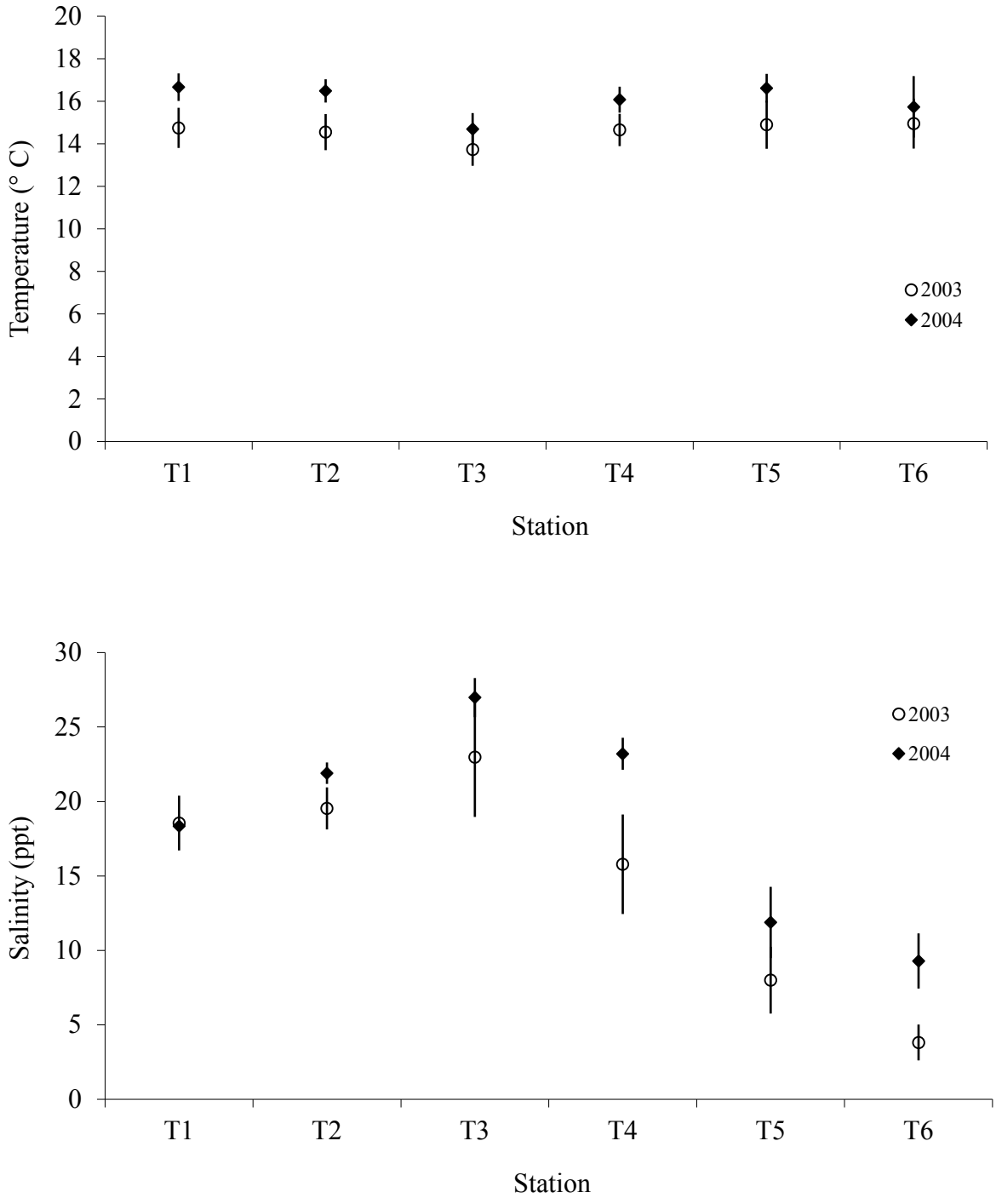


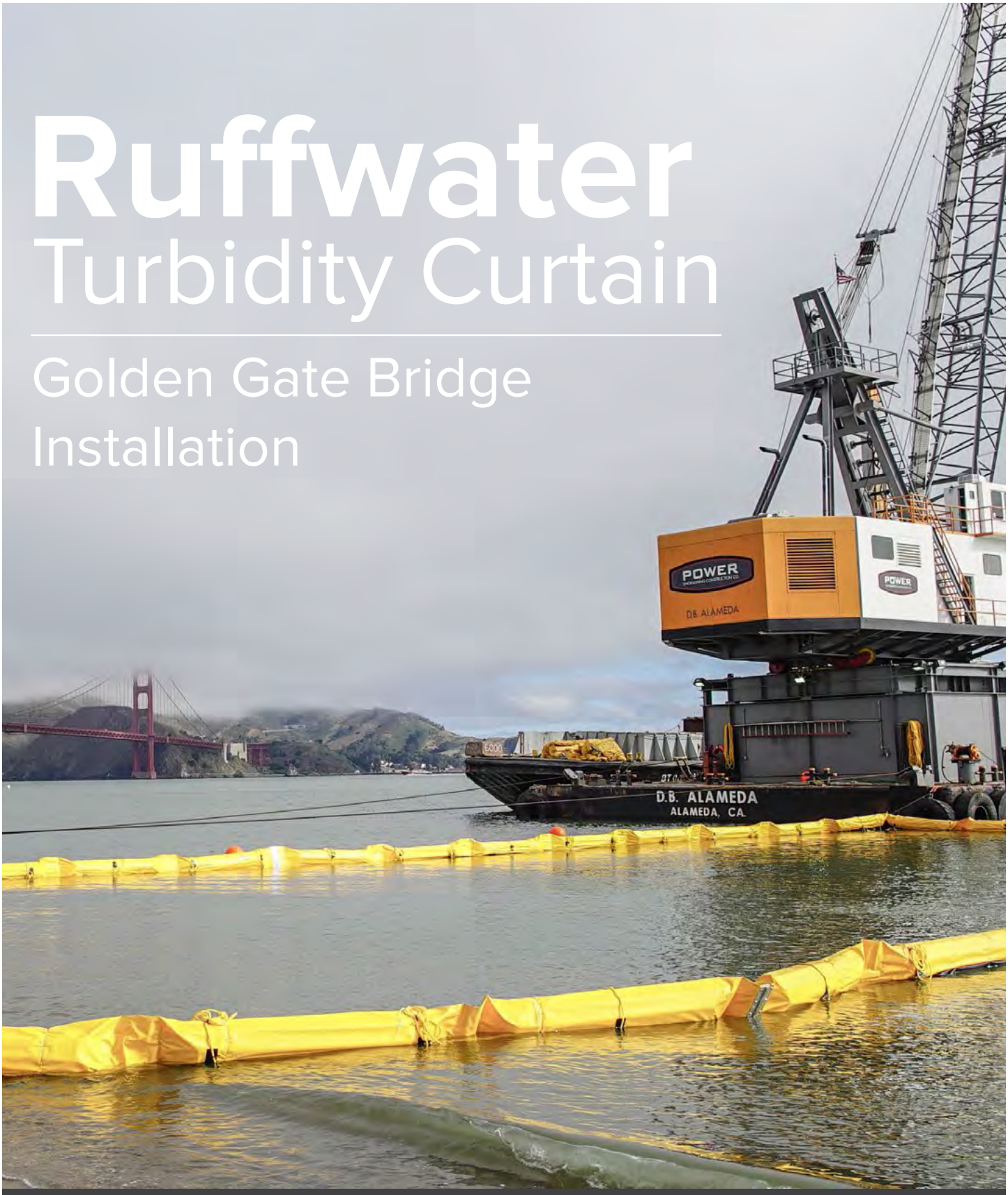
Figure 12. Mean water temperature and salinity across Safety Sound, 2003 and 2004. Stations are listed east to west. Vertical lines are 1 SE. Transects were not performed in 2005.

Exhibit 10

Turbidity Curtain Case Studies and Specifications

Ruffwater
Turbidity Curtain

Golden Gate Bridge Installation



ELASTEC

Oil Spill Equipment | Floating Barriers | Incinerators

The Project: Crissy Field Drainage Improvement Project San Francisco, California

A stormwater drainage outfall pipe near the Golden Gate Bridge needed to be widened and extended to prevent blockage from sand buildup which contributed to flooding problems upstream in the Crissy Field and Mason Street areas in San Francisco.

Environmental Impact Mitigation
To protect the fish and marine wildlife, underwater Best Management Practices were established before dredging and repair of the pipe began. An ELASTEC Type III Ruffwater Screen turbidity curtain was installed to minimize construction impacts and silt flow to this sensitive habitat.

ELASTEC Type III Ruffwater Screen
This is a heavy duty premium turbidity curtain for use in demanding waters such as tidal areas, nearshore ocean environments with strong currents, rivers, bays, harbors and lakes. An ELASTEC Ruffwater Screen controls the migration of silt and turbid water in the construction zone, keeping the surrounding water and marine wildlife safe.

In the Crissy Field project, 500 ft. of the 8 ft. skirt curtain was configured in a “U” shape to encompass the work site. The curtain installation was conducted by Elastec and monitored by the media, California Department of Transportation (Caltrans) and marine biologists. Crissy Field falls under the National Park Service jurisdiction. Powers Engineering Construction was the project contractor.

“It performed like a champ!”

On behalf of Caltrans I would sincerely like to thank you and your crew for our turbidity control curtain. Thank you to the Elastec family for assisting Caltrans in designing a Best Management Practice that has been both cost effective and has exceeded our expectations in performance.

Recently I was observing the waves onsite crashing against the shoreline - the winds were so strong they were blowing our plastic covers about; however, the turbidity curtain remained intact and during dredging operations there was no visible notice of turbidity outside of the curtain! It performed like a champ!

Eltora Charles, Civil T.E.
California Department of Transportation

ELASTEC

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Carmi, IL 62821, USA
Phone: +1 (618) 382-2525
Fax: +1 (618) 382-3610
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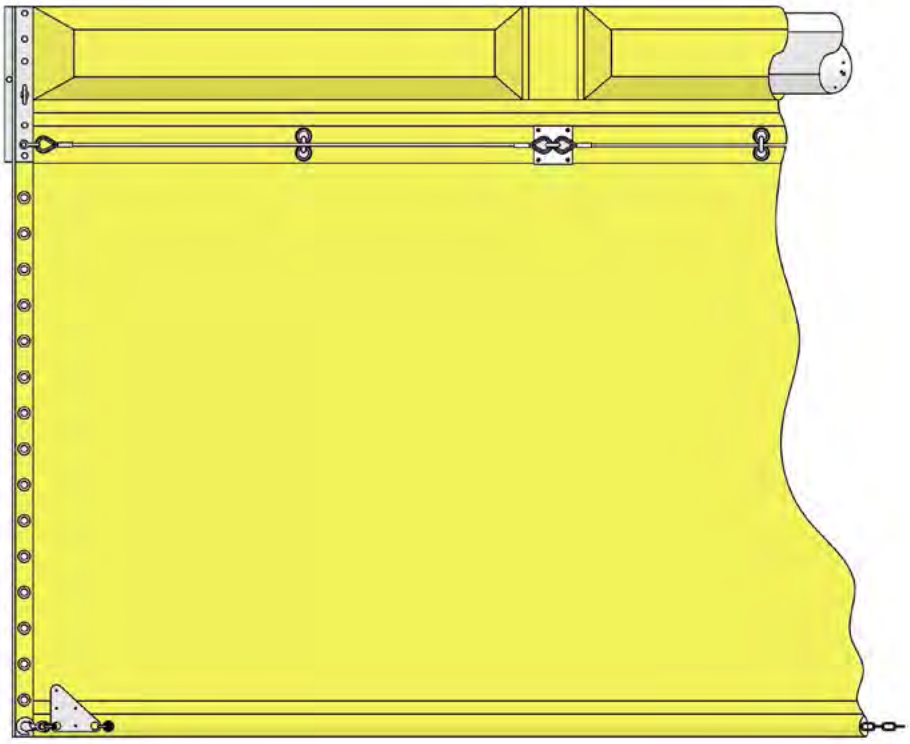
RBC-002
7/27/15

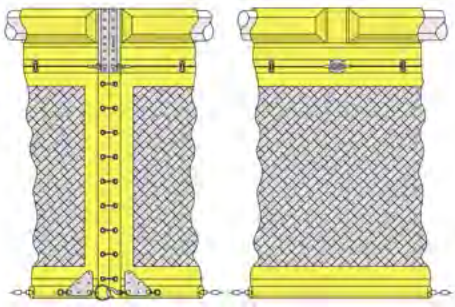
1309 W. Main St. Carmi, IL 62821
Tel: +1 (618) 382 2525 Fax: +1 (618) 382 3610
E-mail: elastec@elastec.com
Web Page: www.elastec.com

RUFFWATER SCREEN

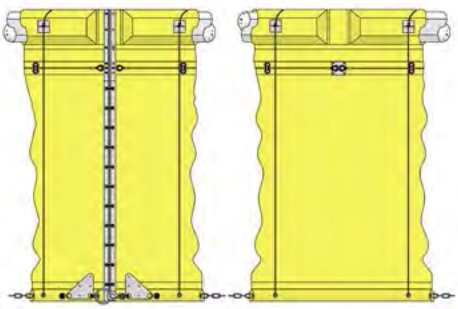


OPTIONAL RUFFWATER SCREEN MODIFICATIONS

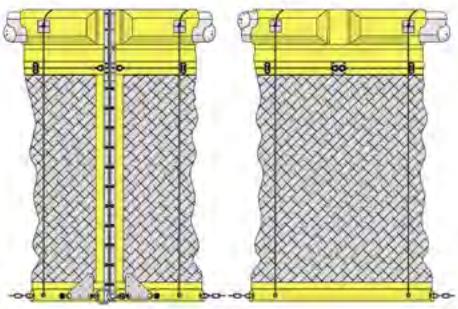
FILTER CLOTH



REEFING SYSTEM



FILTER CLOTH & REEFING SYSTEM



Type III Ruffwater Screen Turbidity Curtain is a heavy duty premium barrier for use in tidal areas or areas where adverse conditions can occur. It is designed for use in demanding water conditions. The curtain intercepts debris and slows the movement of rough water, helping to keep marine habitats safe.

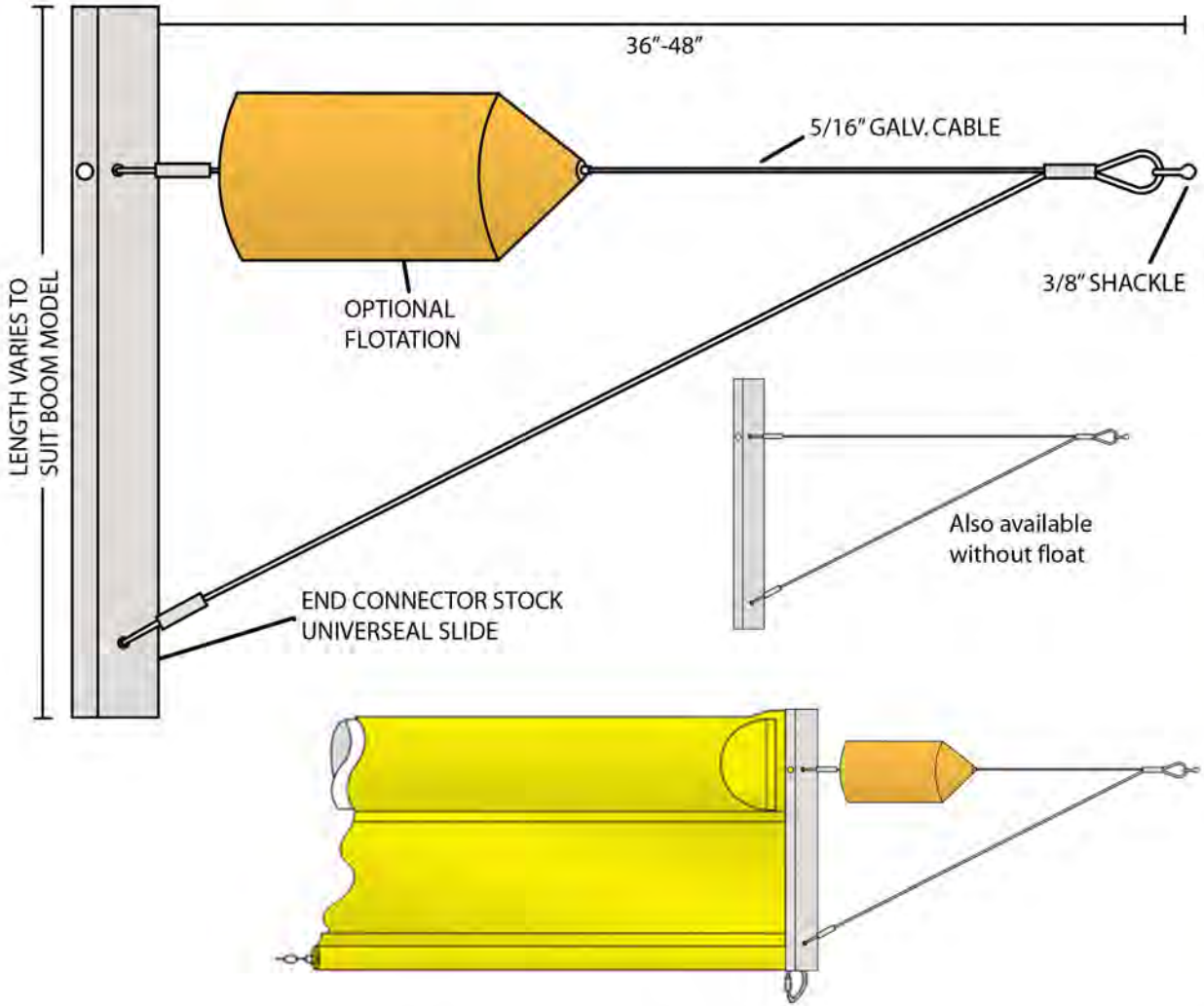
RuffWater Screen is the toughest turbidity curtain for sediment and silt control to protect fragile environmental conditions. The California Depatrment of Transportation's (CALTRAN) Crissy Field Drainage Improvement Project installed the RuffWater Screen to mitigate silt and turbid water in the construction zone. This project has received several environmental awards and recognitions. This curtain is well suited for the construction of bridges, intakes, and pipelines. It is available in permeable and impermeable options.

Section Length	100 ft / 30 m Standard (other lengths available on request)
Draft	3 - 30 ft / xx m (custom depths available on request)
Freeboard	12 inchs / xx cm
Flotation Element	12 inch octagonal expanded polystyrene logs placed end to end in the top fabric pocket with separations between logs to allow folding for storage.
Base Fabric	22 oz PVC - Safety Yellow (other colors available) 500 lb/in^2 tensile strength
Permeable Fabric	Bradley Fabrics - Phoenix XL55 (specifications available on request)
Tension Cable	2 each 5/16” galvanized steel cable, with a break strength of 10,540 lbs, is sheathed in vinyl and seamed into the fabric one on each side of the skirt 20” below the flotation. These cables are shackled to the section connectors for uniform tension load transfer.
Ballast	The ballast/tension member is a 3/8”, or heavier, galvanized steel chain enclosed in a double layer fabric pocket at the bottom of the skirt. The ballast chain enables the skirt to hang vertically in the water column. The ballast chain is shackled to a stainless steel stress plate at the end of each section. A hook and ring arrangement is provided to transfer the load from one section to the next through the stress plates.
Section Connector	Section of RuffWater Screen are joined together by sliding together the aluminum Universeal connectors that extend from the top of the flotation down the edge of the skirt. Below the connectors, skirts are joined by rope ties between evenly spaced grommets on the skirts. The ballast chain/stress plates are attached via a safety hook and ring. No tools are required.
Anchor Points	Provided every 50 ft. Standard anchoring is 1 anchor every 100’ in one directional flow (on upstream side), or 2 every 100’ (one on each side) if bi-directional is anticipated. Should flows increase or additional anchors be needed, the points will already be in place 50’ OC.
Reefing System (optional)	To raise and lower the curtain skirt. This allows for the system to match the depth requirements of the project exactly.
Optional Items	Marker Buoys, Anchor Systems, Navigational Warning Lights, Repair Kits, Oil Spill Kit, Incinerators, Debris Boom

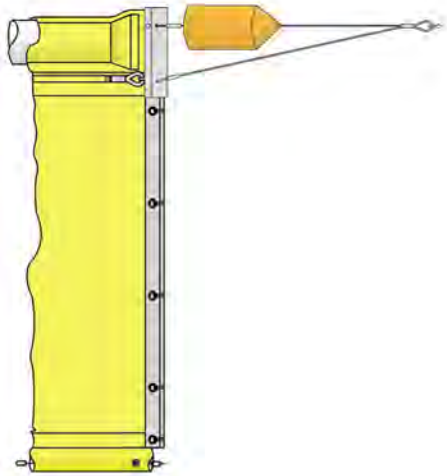
ELASTEC INC.

AmericanMarine INC.
Innovative Environmental Products

Tow Bridles



Tow Bridles can be provided with or without auxiliary floats. They may be used for handling the containment boom or silt curtain in water. Prior to deployment, the connector on the tow bridle should be mated to the boom or silt curtain and secured with a toggle pin. The shackle on the tow bridle will accept a line up to 3/4" in diameter. A choice of connectors are available.



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401 Shearer Blvd. Cocoa, FL 32922
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Email: elastec@elastec.com www.elastec.com

DBC-016
4/13/09

ELASTEC INC.
AmericanMarine INC.

401 Shearer Blvd. Cocoa, FL 32922, USA
Tel: (321) 636-5783 Fax: (321) 636-5787
E-mail: elastec@elastec.com
Web Page: www.elastec.com

Phoenix 55XL

Fabric Property	Unit	Test Method	Minimum Average Roll Values
Fabric Weight	oz/yd^2	ASTM D-3776	7.4
Thickness	mils	ASTM D-1777	18
Grab Strength (MD/CD)	lbs	ASTM D-4632	350
Grab Elongation (MD/CD)	%	ASTM D-4632	21
Wide Width Tensile	lbs/in	ASTM D4595	225
Wide Width Elongation @ Break	%	ASTM D4595	18
Wide Width Tensile @ 5% Strain	lbs/in	ASTM D4595	80
Wide Width Tensile @ 10% Strain	lbs/in	ASTM D4595	150
Trapezoid Tear Strength (MD/CD)	lbs	ASTM D-4533	125
Puncture Resistance (5/16")	lbs	ASTM D-4833	165
Mullen Burst Strength	psi	ASTM D-3786	695
Vertical Water Flow	gpm/ft^2	ASTM D-4491	70
Coefficient of Permeability, K	cm/sec	ASTM D-4491	.046
AOS (Mod. to 10 min.)	sieve size	ASTM D-4751	45

MD = Machine Direction
CD = Cross Machine Direction

Reputable case study on effectiveness of bottom sealed turbidity curtain.

Evaluation of Filtering Geotextile Aquatic Filter Barrier Technology for Controlling Suspended Sediments and Turbidity During Dredging, Construction and Demolition

Andrew J. McCusker, C.E.P., Jaret Johnson, P.E., Melissa Hamlin and Christian Guelke
(Mackworth Group LLC, Scarborough, ME, USA)

MACKWORTH-ENVIRO
Aquatic Barrier & Screening Solutions

BARRIER TECHNOLOGY

Typically

- **Flexible geotextiles** for in-waterbody filtering, containment, flow training
- **Flotation** to support barrier curtain and maintain integrity at water surface
- **Sealed at sides and bottom** to prevent unfiltered flow

For Some Applications

- Impermeable materials, various mesh sizes
- Fixed frame or structure
- Automated air-cleaning systems with feedback instrumentation

MACKWORTH-ENVIRO
Aquatic Barrier & Screening Solutions

FULL-DEPTH, SHORE-TO-SHORE ENGINEERED TURBIDITY & FISH EXCLUSION BARRIER

Intertidal Coal Tar Remediation

Portland Harbor, Maine

7

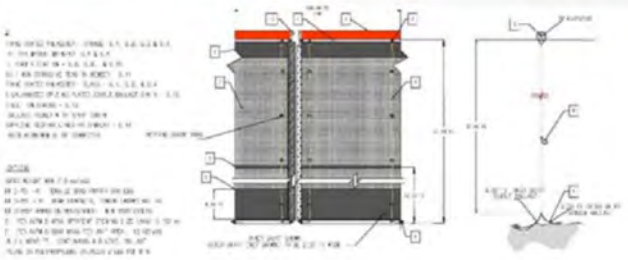
FULL-DEPTH, SHORE-TO-SHORE SYSTEM

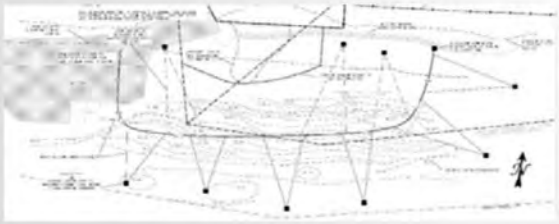
- Coal Tar Remediation
  - Voluntary; site of former MGP
  - Intertidal excavation
- AMEC Foster Wheeler Project
  - Mackworth-Enviro provided **turnkey** from design through installation, operation and removal
- ***Turbidity and Fish Exclusion Barrier – selected over a temporary sheet pile wall cofferdam***
  - Substantial cost savings
  - Substantial savings to overall schedule
  - Provided partial relief from time-of-year restrictions by excluding winter flounder during spawning season

FULL-DEPTH, SHORE-TO-SHORE SYSTEM

Challenges:

- Up to ~15-ft tides; strong tidal currents
- Sudden heavy loads from tanker and tug transit
- Rocky, uneven bottom; rock seawall
- Critical need to contain contaminants
- Threading through old pilings





Solutions:

- 3 layers for strength/filtration, plus sorbent
- Helical anchors for bottom holding strength
- Rock anchors & T-skirt into rock wall shoreline attachment – daisy chain helical anchors added on shore after rock pulled away

FULL-DEPTH, SHORE-TO-SHORE SYSTEM

Performance & Lessons Learned:

- No violations
- No sheen or turbidity plume observed outside of barrier
- Water displacement due to tanker with excessive speed pulled rock from seawall
- Barrier remained in place and sealed to bottom throughout.

Aerial view showing an example of a turbidity curtain effectively containing turbidity on a separate dredging project.