Attachment C

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

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

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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.

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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
ºC-	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

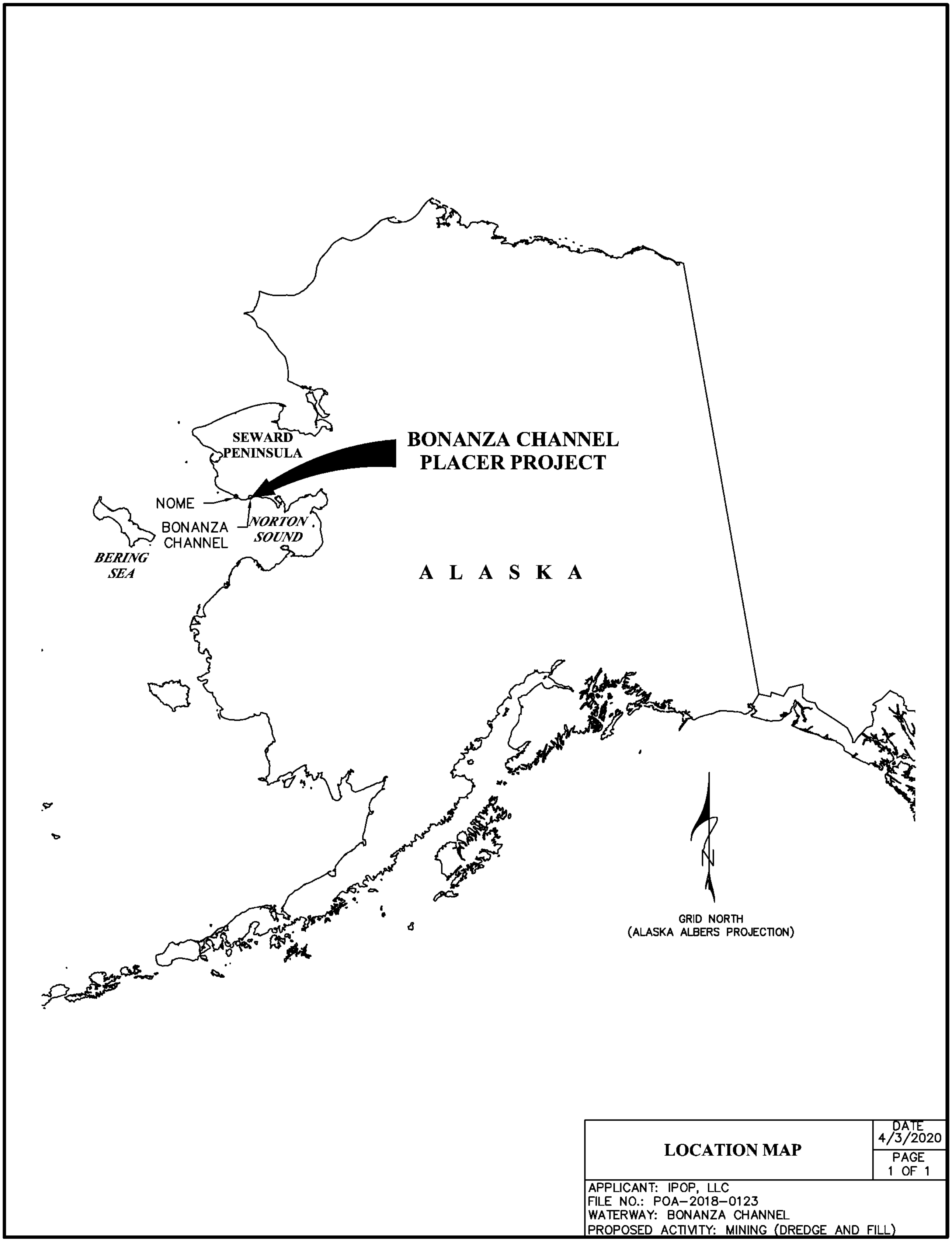


Figure 1-2. Initial project area, BCPP (graphic scale accurate, verbal scale refers to full size printed map)

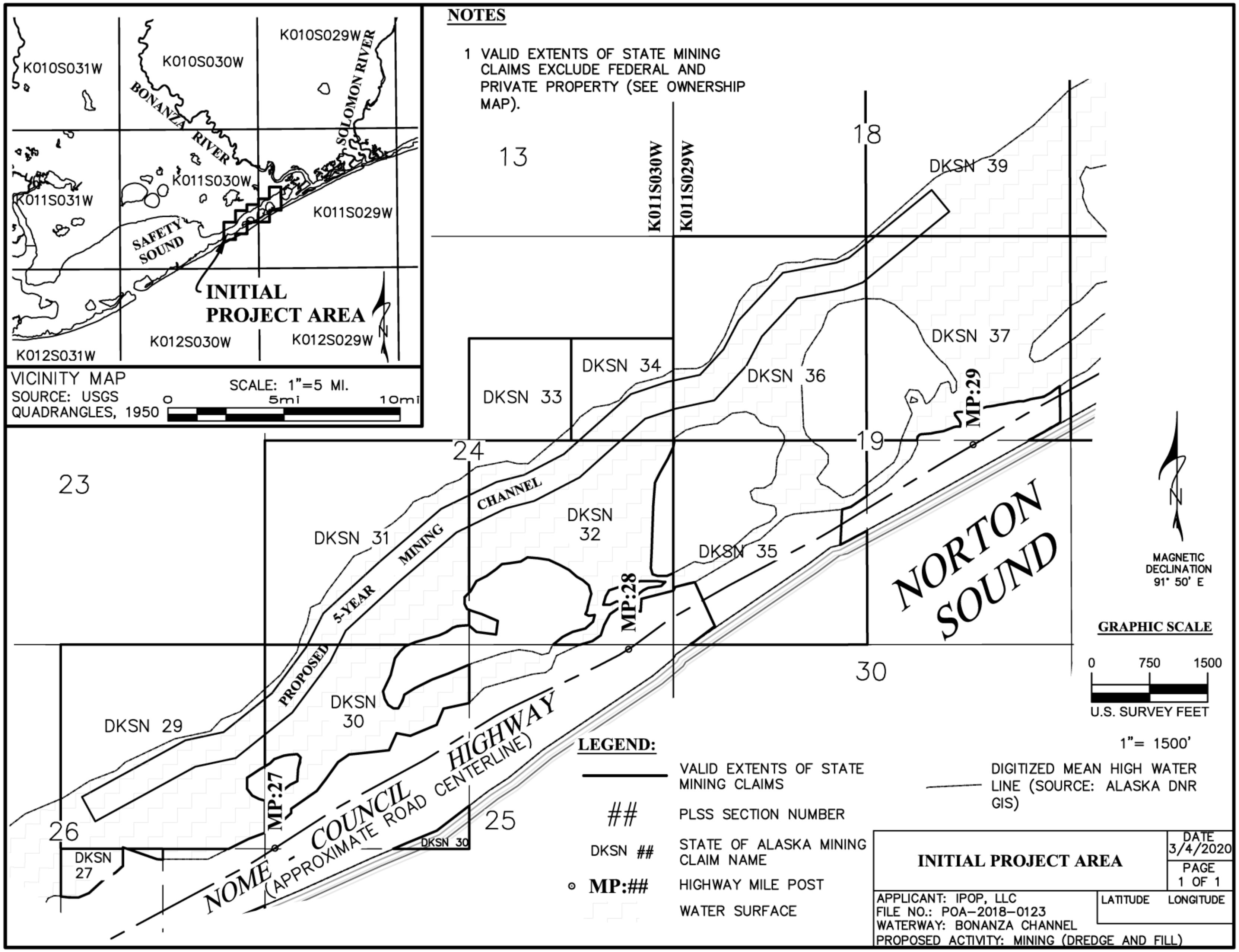


Figure 1-3. Central project area, BCPP (graphic scale accurate, verbal scale refers to full size printed map)

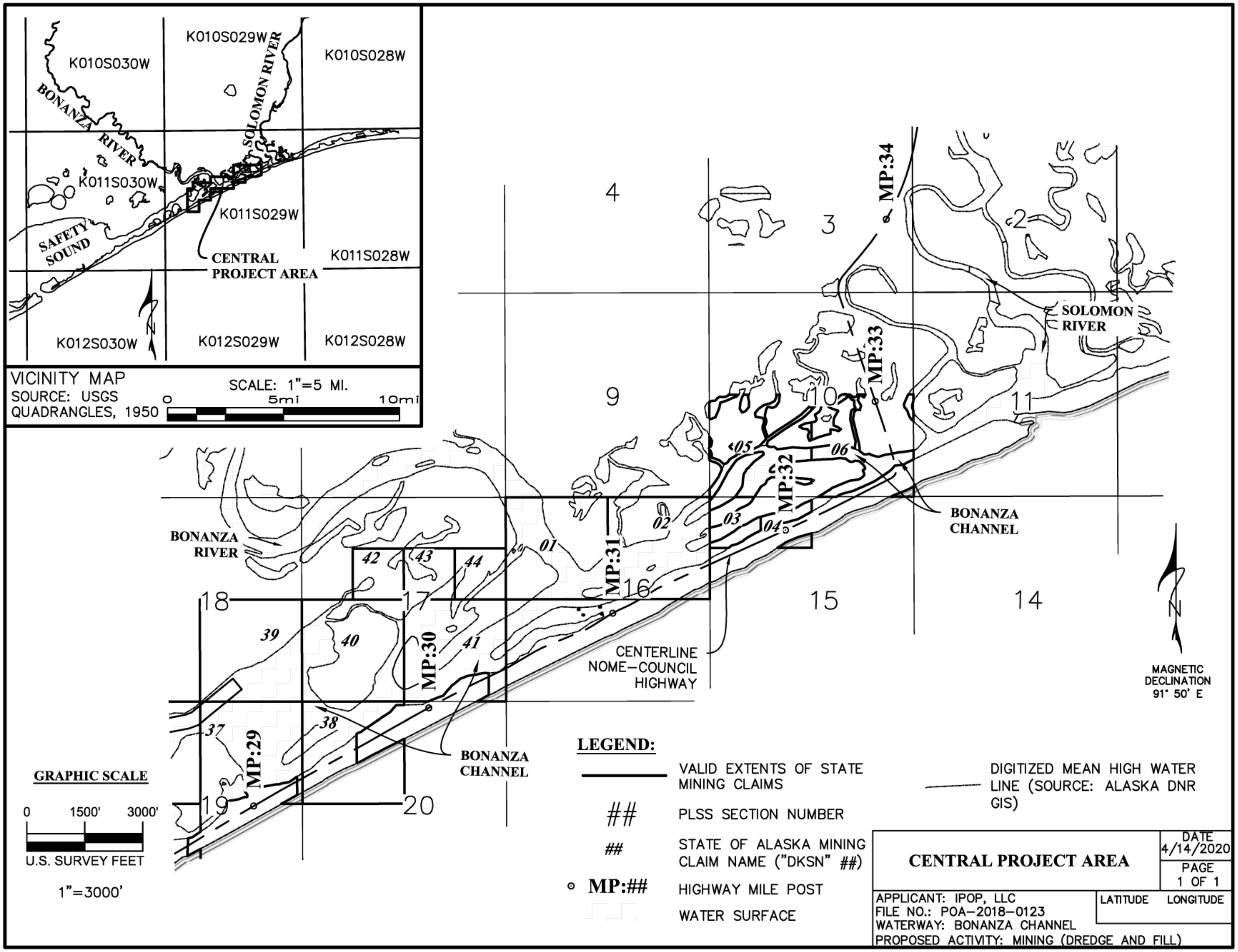


Figure 1-4. Eastern project area, BCPP (graphic scale accurate, verbal scale refers to full size printed map)

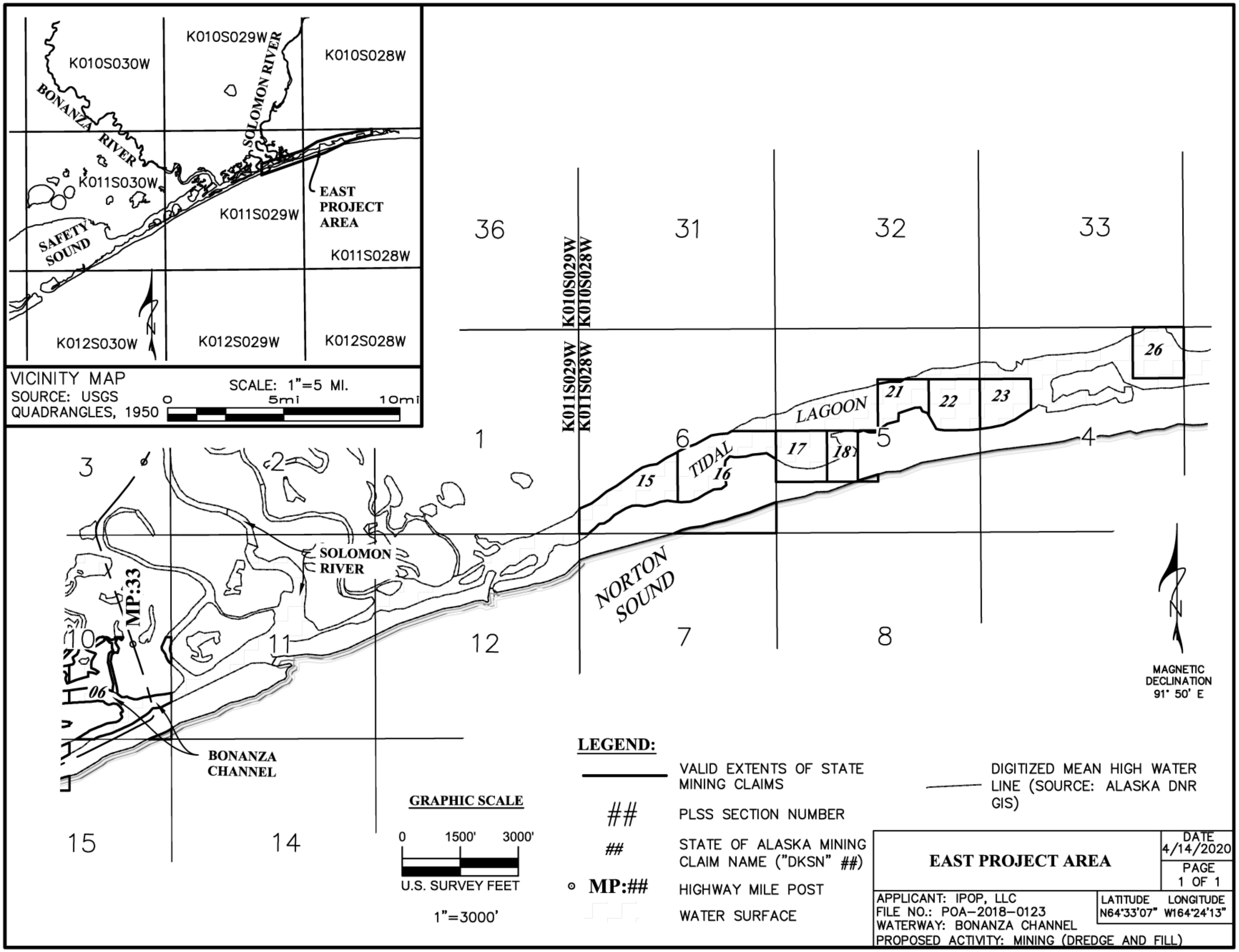


Table 1-1. Geographic location of the Bonanza Channel Placer Project

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.

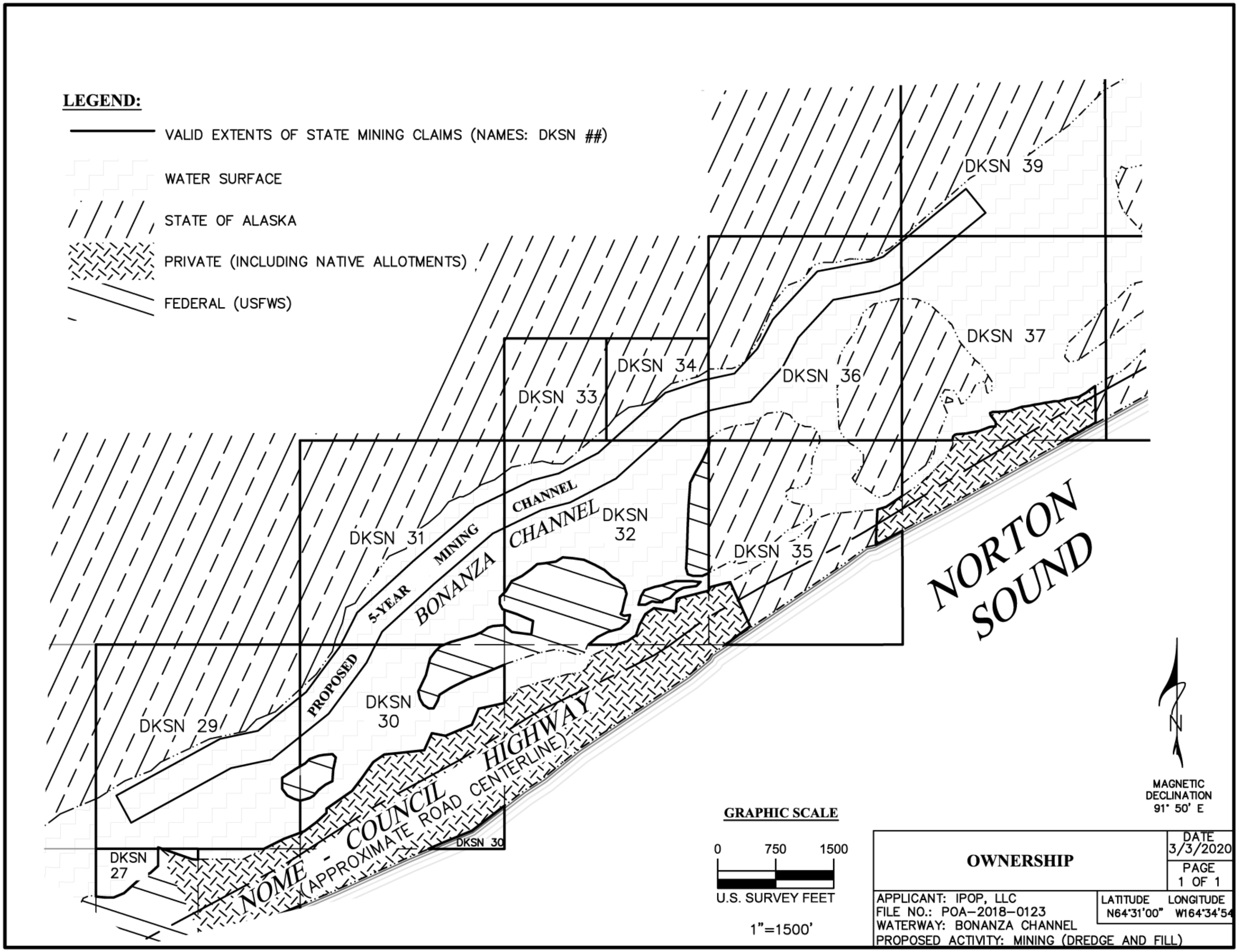
Title to the subsurface estate of Kateel River Meridian Township 11 South, Range 28 West, section 6, was patented to Bering Straits Native Corporation pursuant the Alaska Native Claims Settlement Act as Patent Number 50-2004-0450 on September 24, 2004. A copy of this patent was recorded in the records 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)

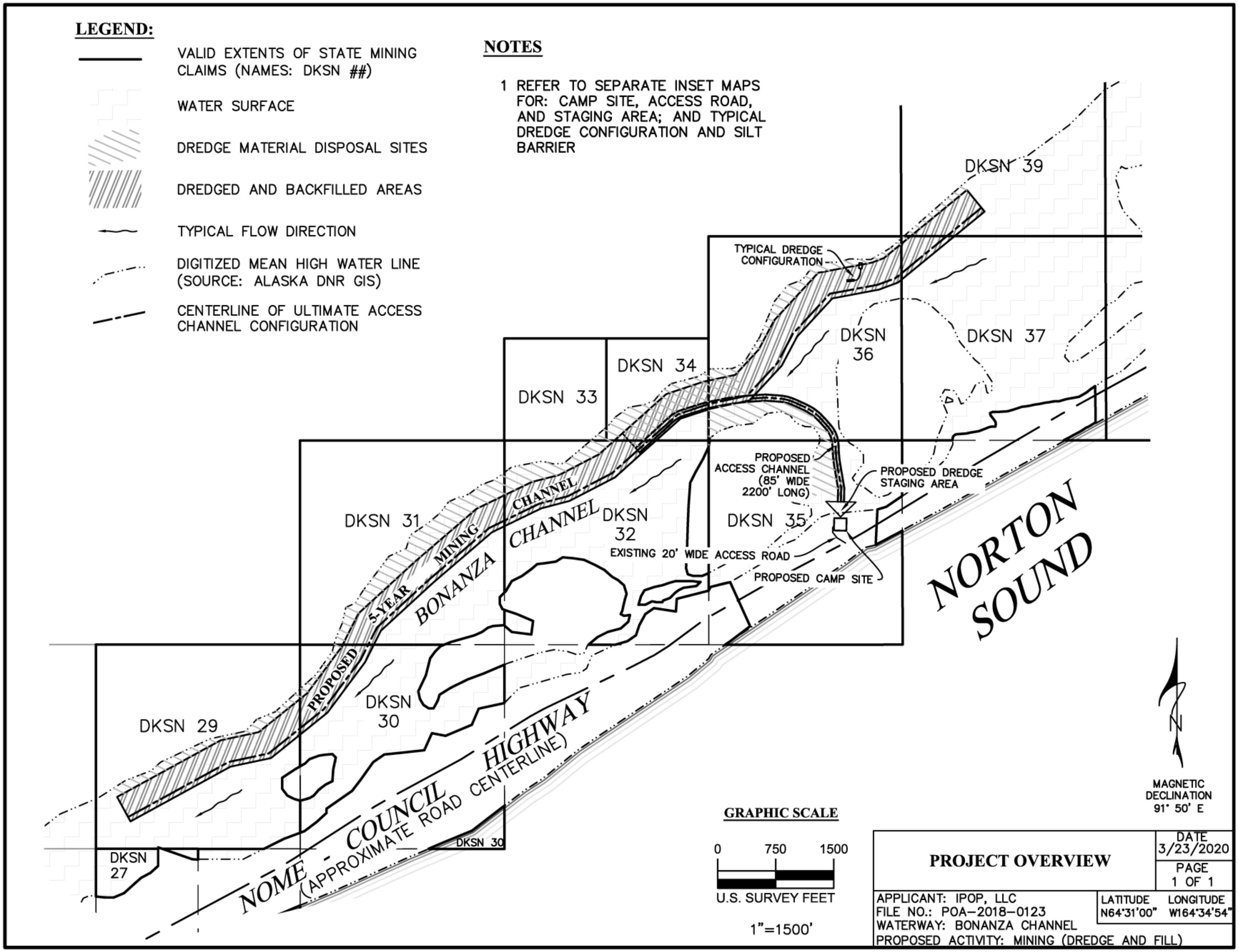


Figure 5-2. Camp Location (graphic scale is accurate, verbal scale refers to full size printed map)

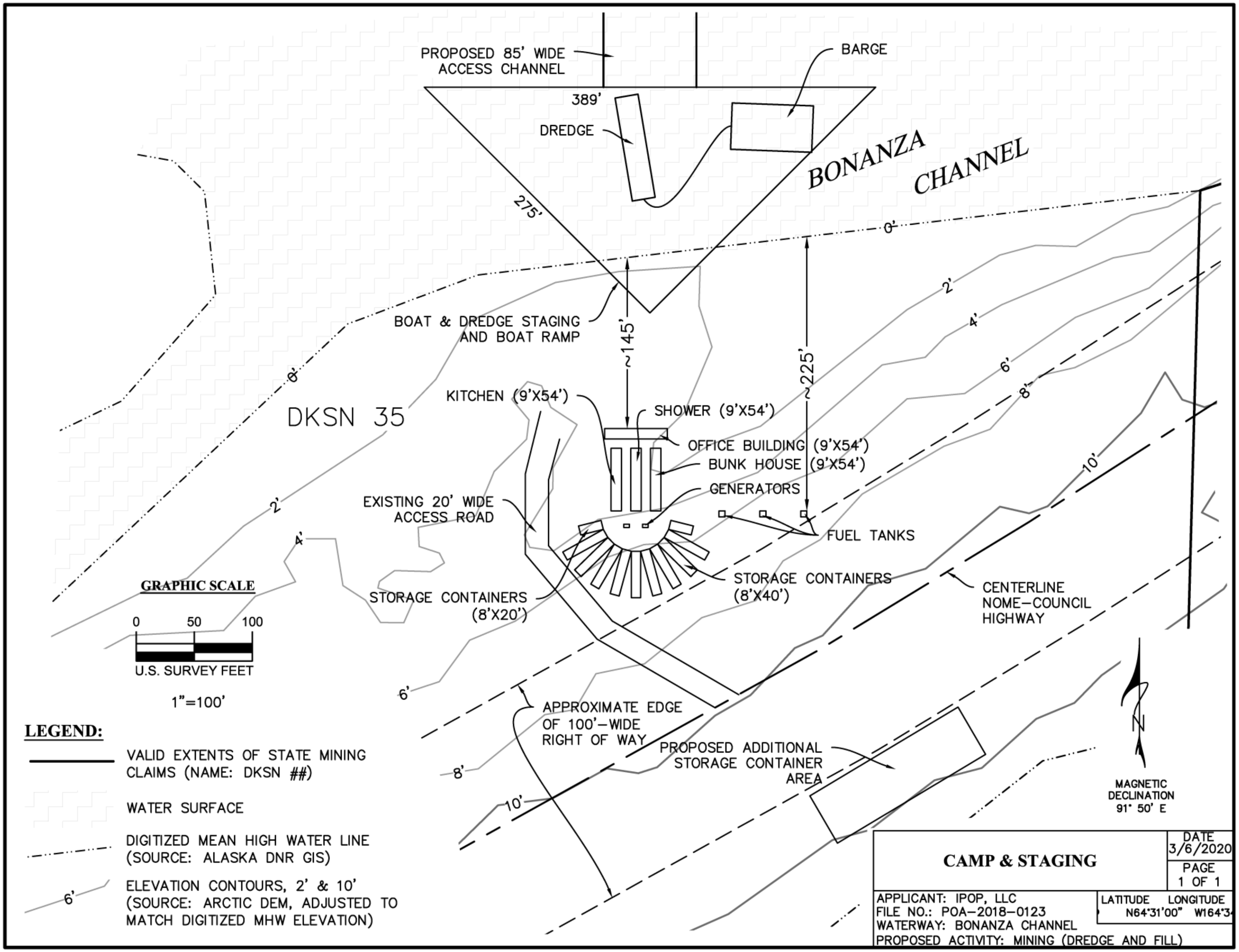
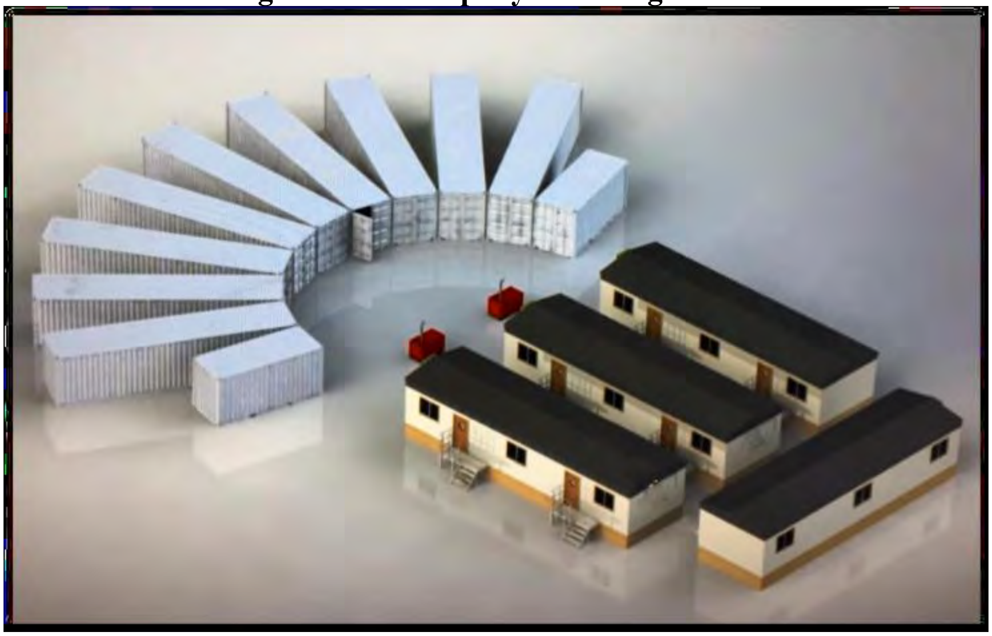


Figure 5-3. Camp layout configuration



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.

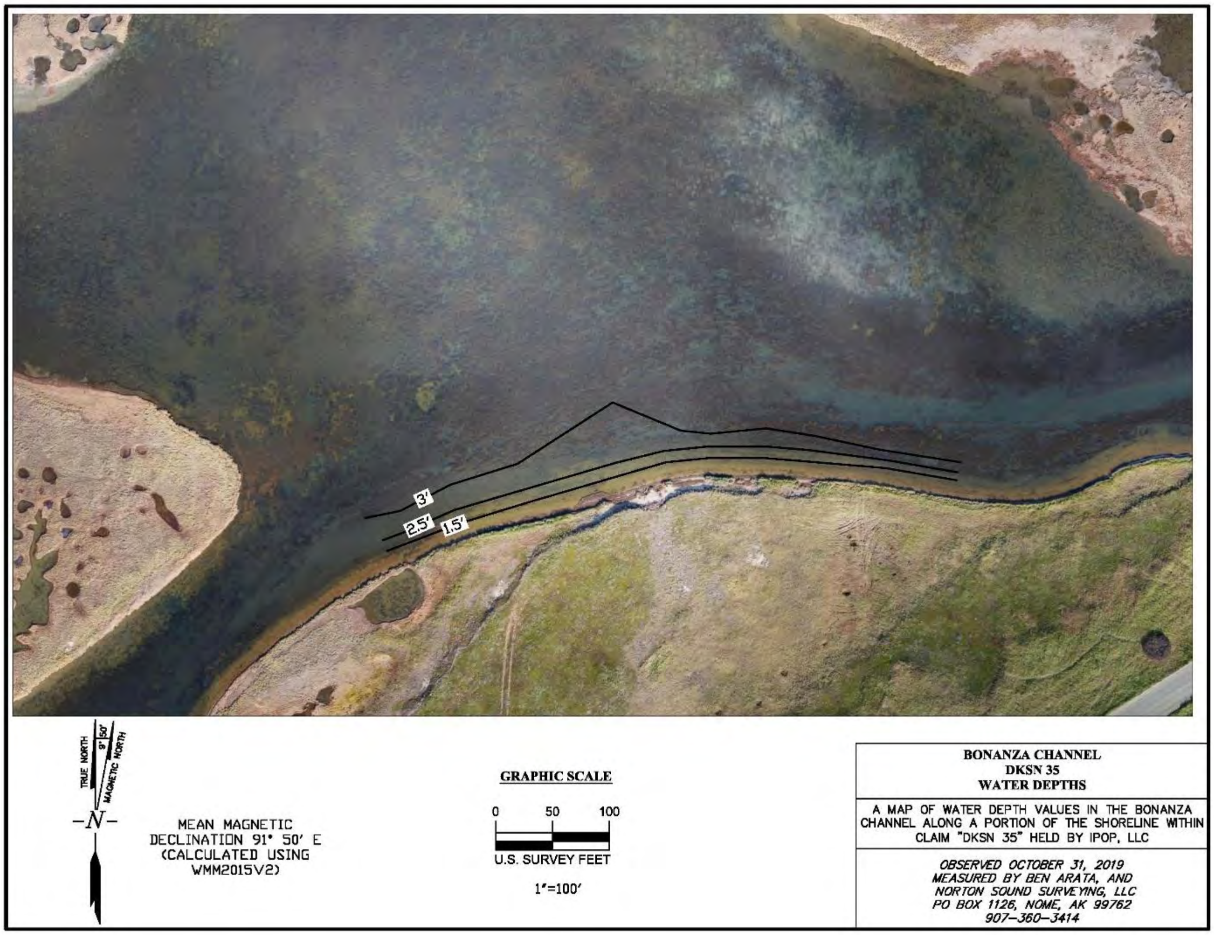
Figure 5-4. Sectional barge platform general layout

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

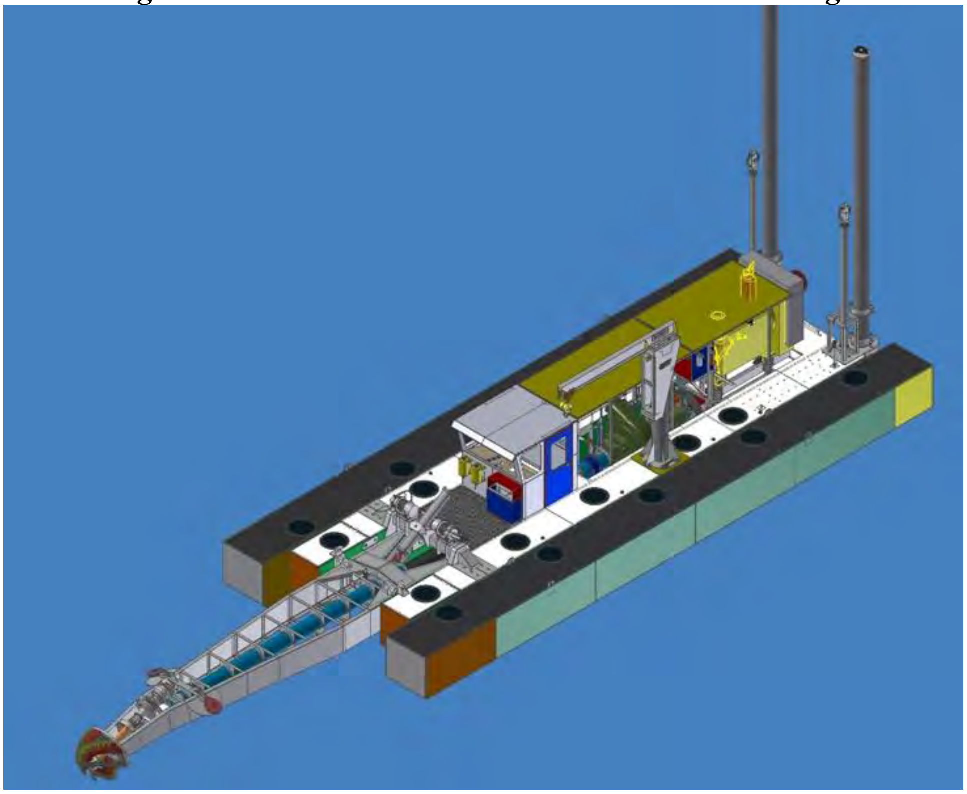


Figure 5-9. Idler float showing pin bushings where it attaches to the dredge

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.

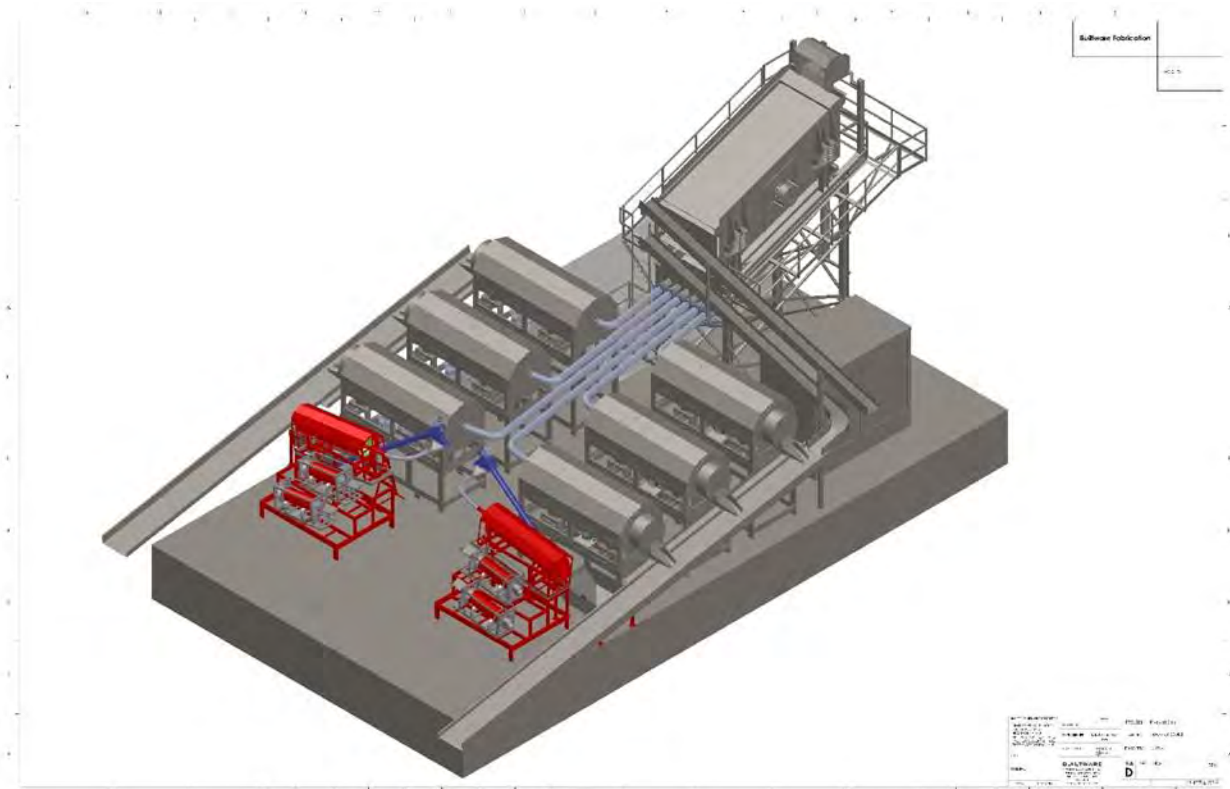
State-of-the-art Hypac© software for dredging control, in conjunction with GPS readings and computer control, the software will allow both excavating and re-depositing materials in a controlled and planned manner, maintaining a record of activities.

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.

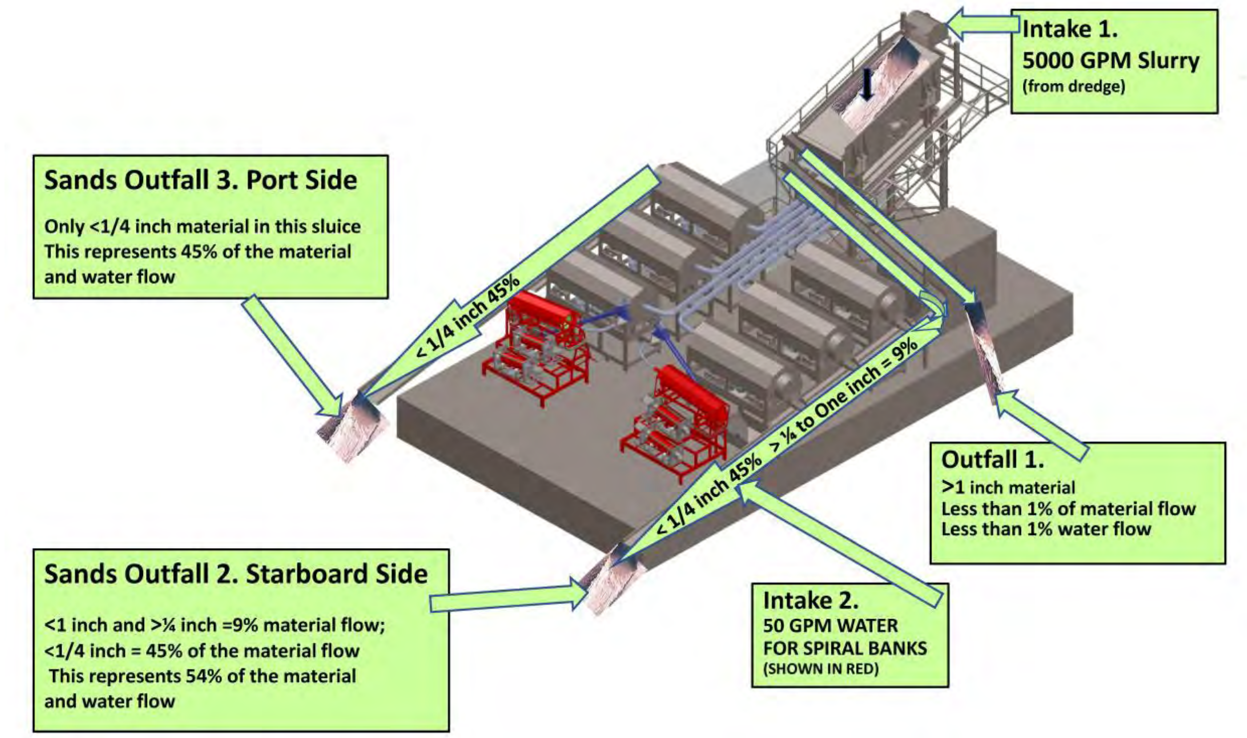
The processing barge is connected to the suction dredging barge, via a 10" internal diameter floating poly pipeline. The dredging operation will only suck up materials smaller than 4".

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

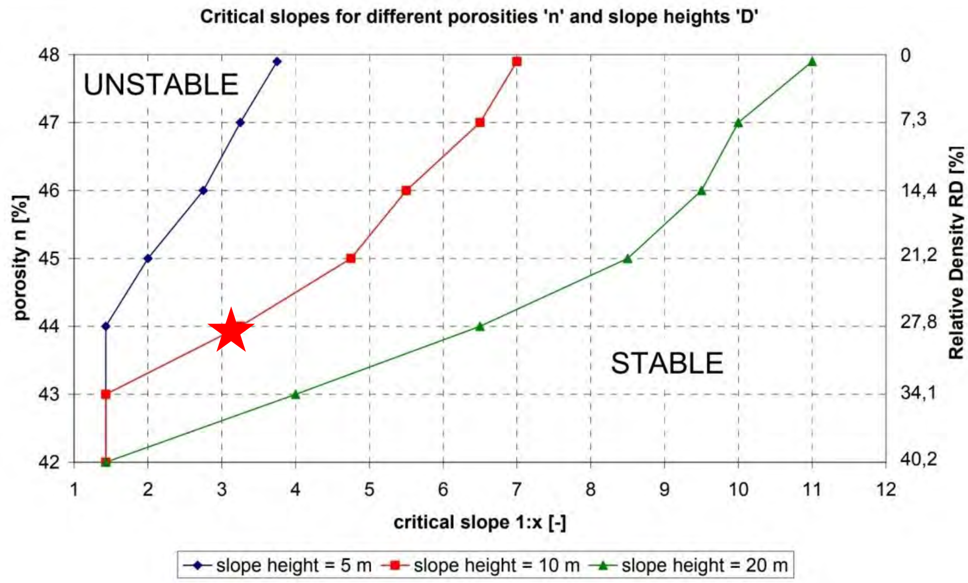
Size fractions are known from the test drill hole analysis and show that the material averages 81.6% sand, 13.12% Silt, and 4.94% clay. Normal facies changes in a beach stratigraphic sequence results in highly variable sand, silt and clay layers that can affect the in-situ stability of the soil. In general, 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		
2018 Core Holes	**Drill Hole ID**	**Sand**	**Silt**	**Clay**	B.F. Bray	B.F. Lecasse
	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			

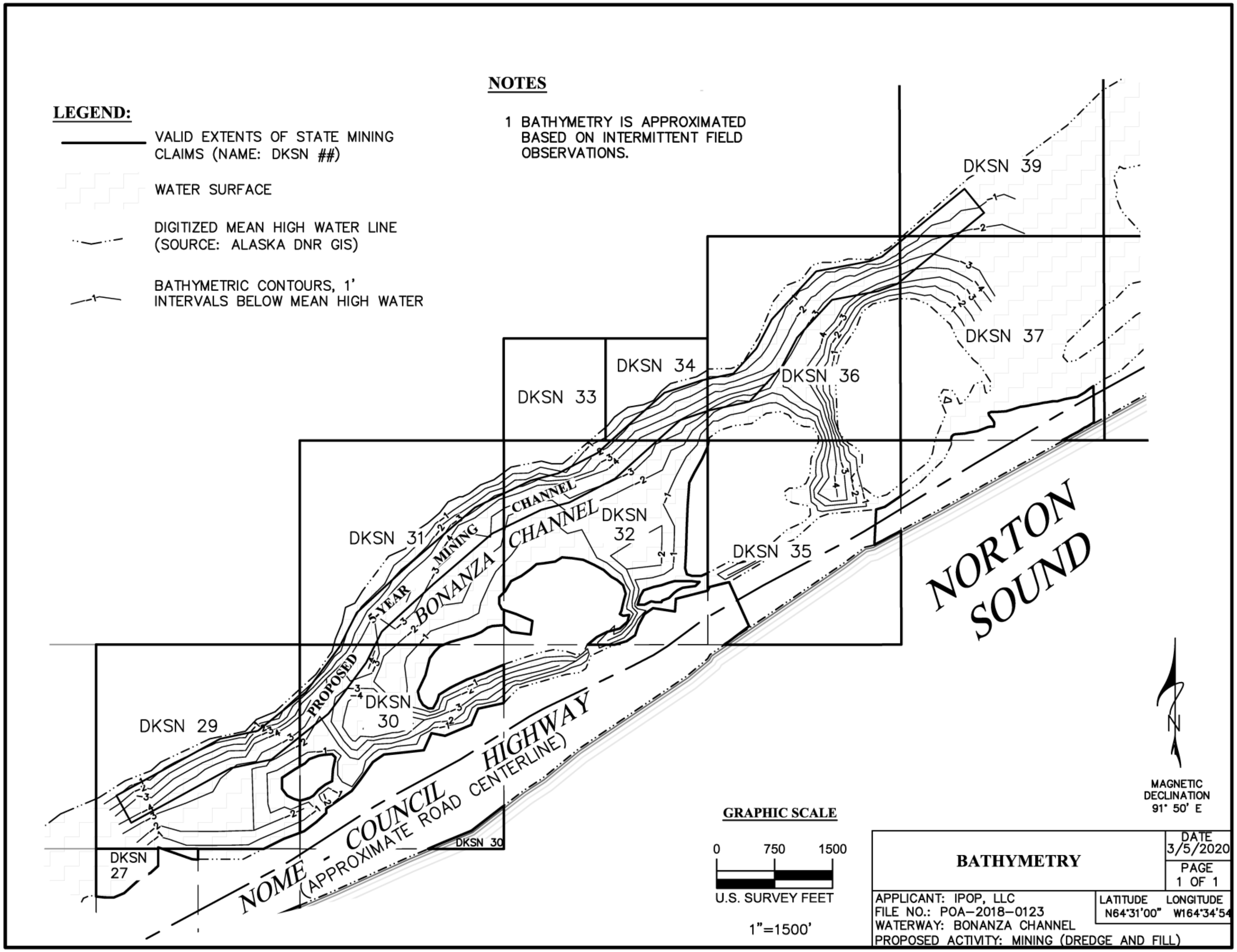
BC=Bonanza Channel
BR=Bonanza River
BCBR=Bonanza Channel Bridge
DL=Dredge Location (near as possible to planned plume study locations)

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)

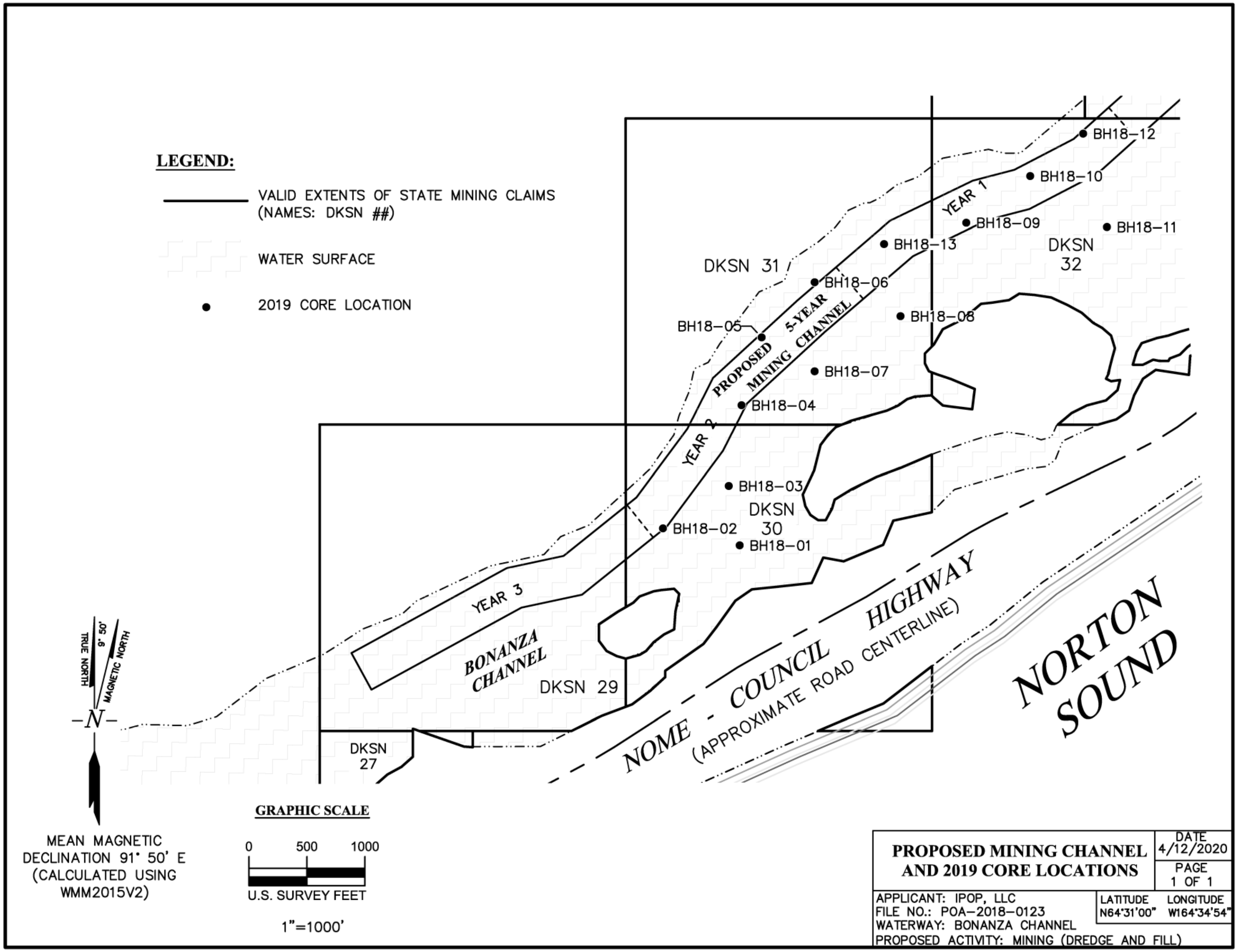
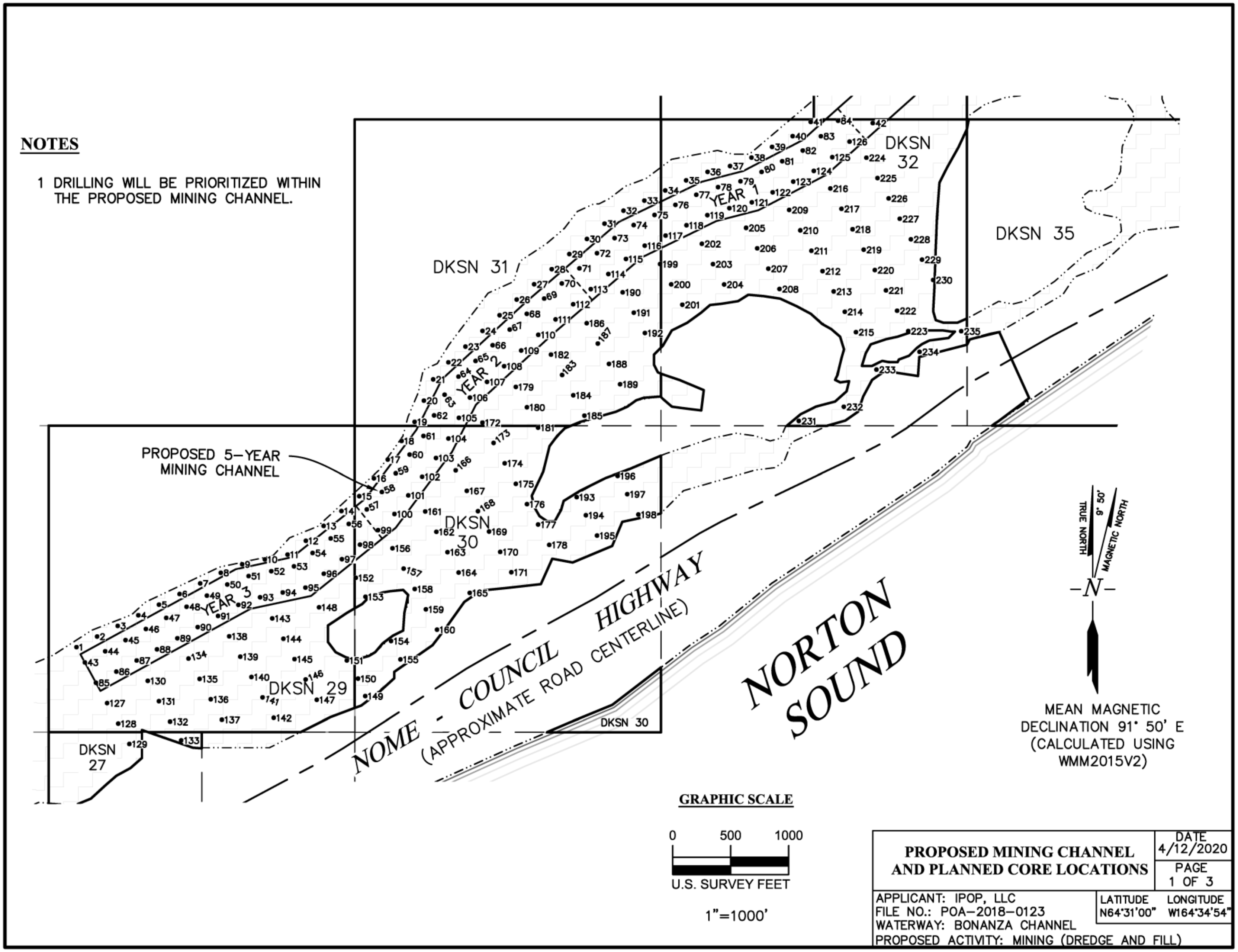


Figure 5-18. Planned delineation drill hole locations (graphic scale is accurate, verbal scale refers to full size printed map)



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

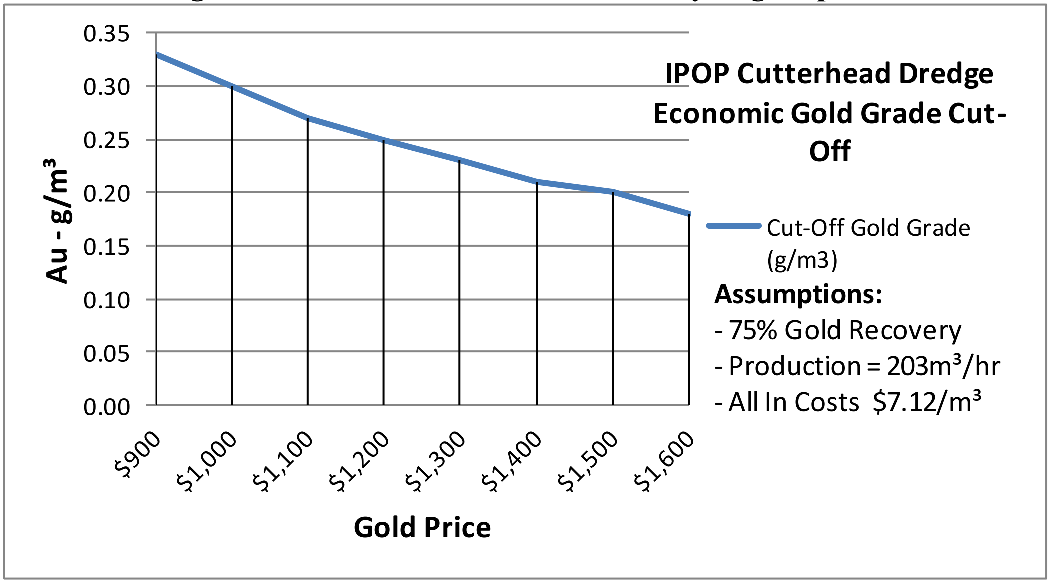
Cost Center	**$/m³**
G&A	$ 2.00
Fuel	$ 0.40
Camp	$ 0.50
Mining	$ 1.80
Processing	$ 1.32
Environmental Compliance	$ 0.10
Maintenance	$ 1.00
Total All-In Dredging Cost/m³	**$ 7.12**
Gold Price	$ 1,300
Recovery	75.0%
$/Gram	$ 31.35
Calculated Cut-Off (grams/m³)	**0.23**

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)

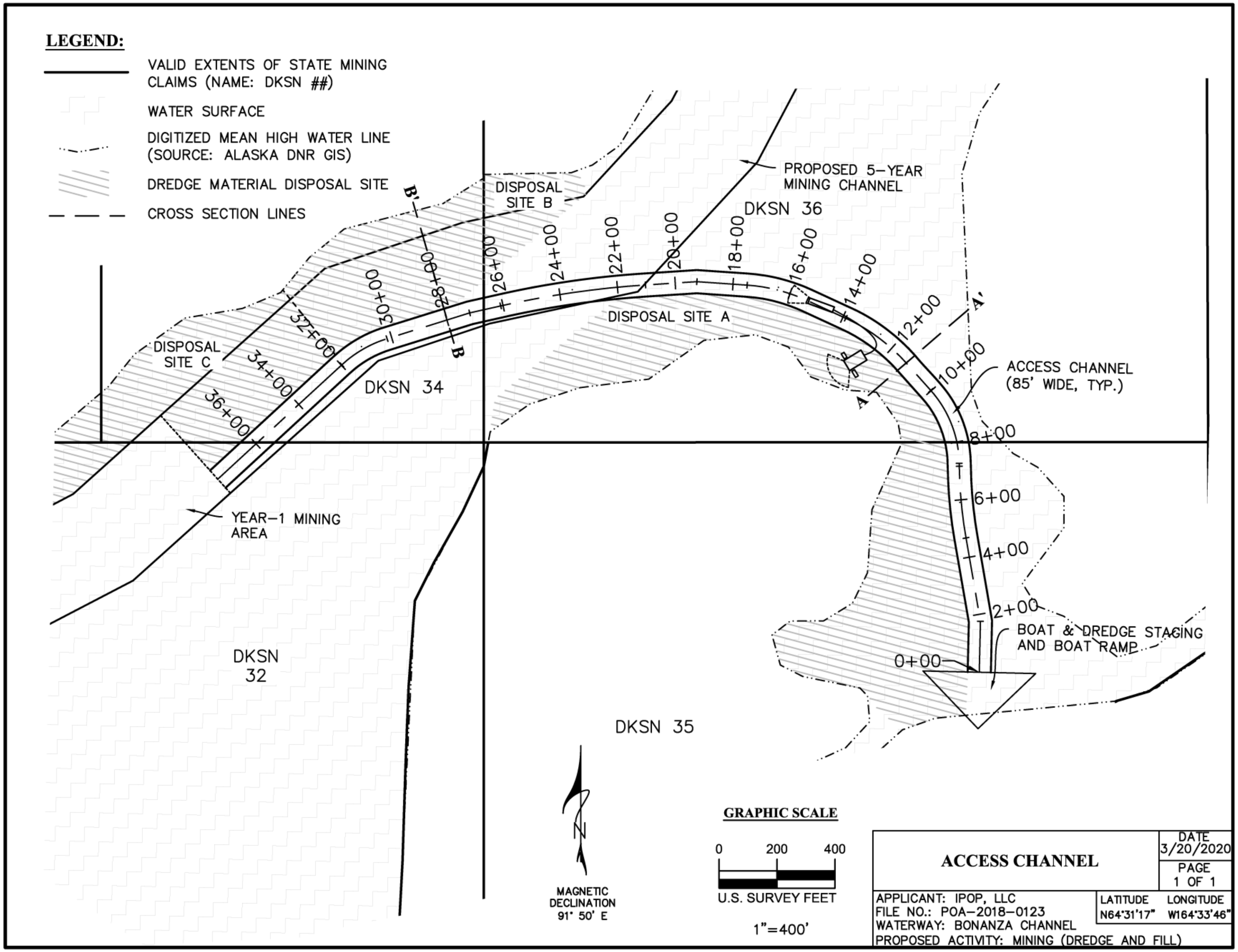
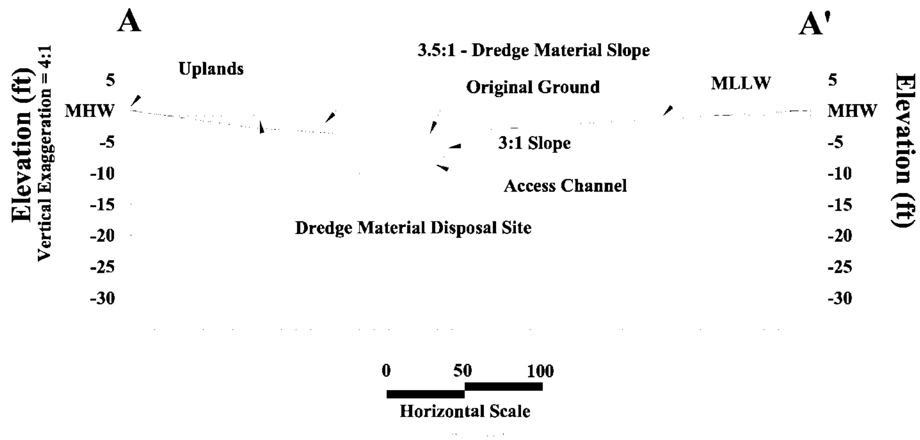
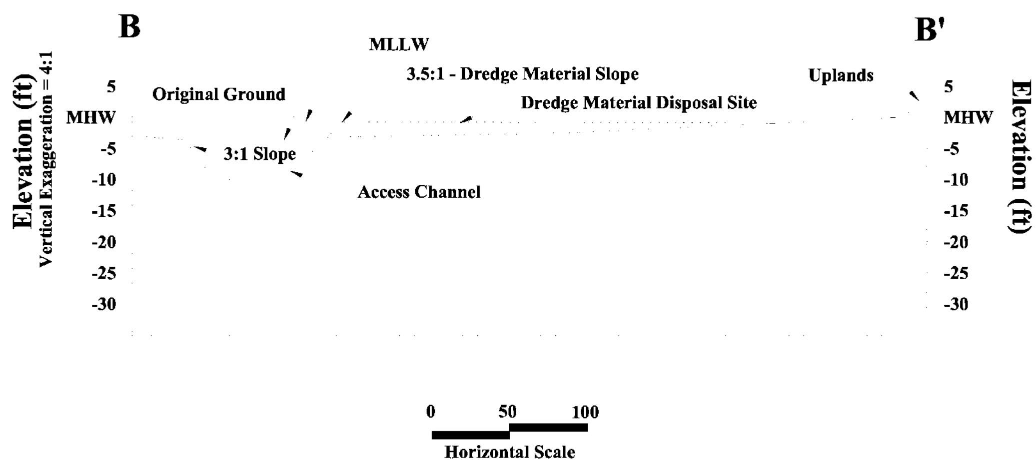


Figure 5-21. Typical cross sections of access channel dredge and fill: A-A' and B-B'





CROSS SECTIONS

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 267yd^3/hr for the work window of 140 days. Assuming 100% equipment availability the operation will dredge at most 897,120 yd^3 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)

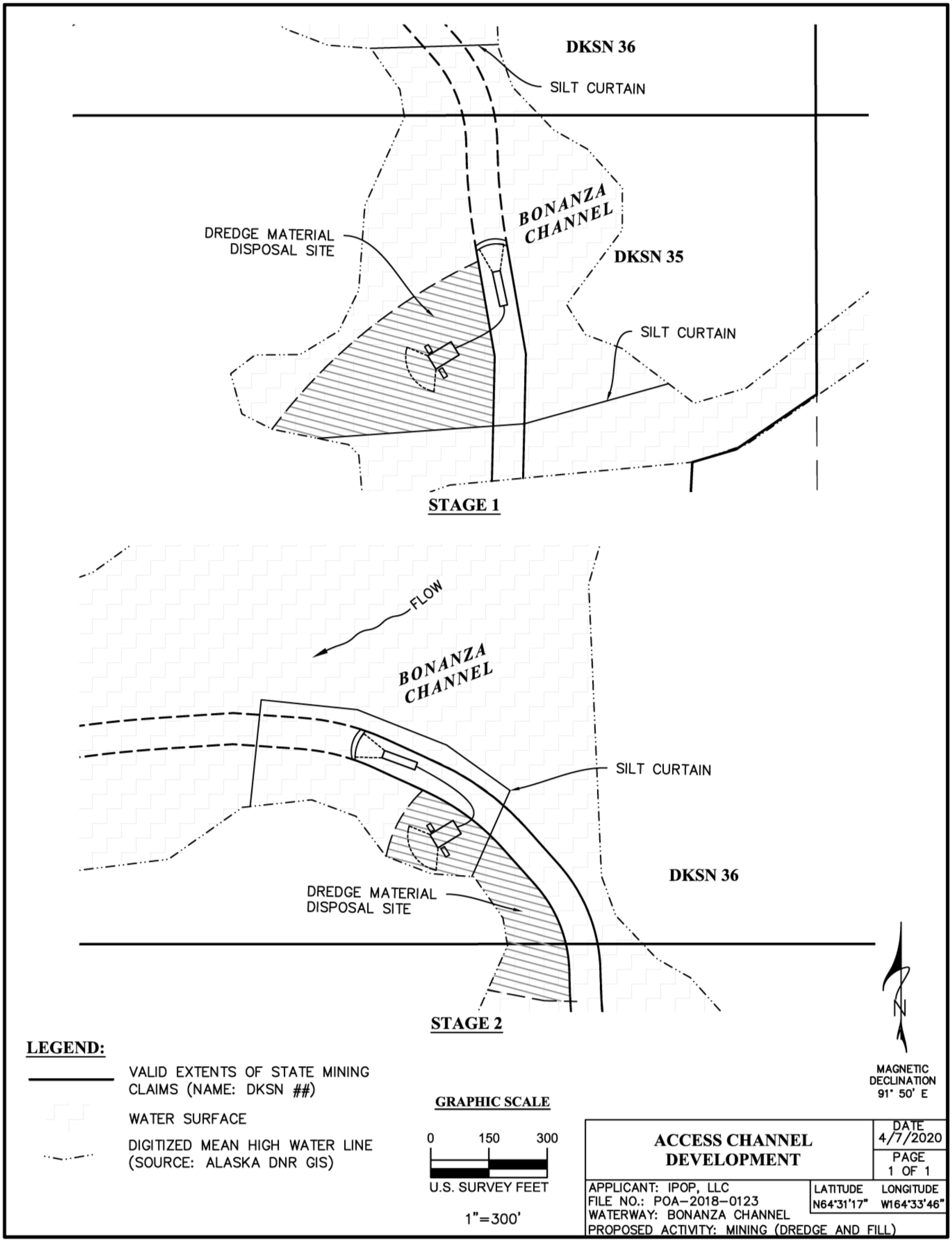


Figure 5-23. Typical dredging layout map showing typical BMP layouts, cut and disposal (graphic scale is accurate)

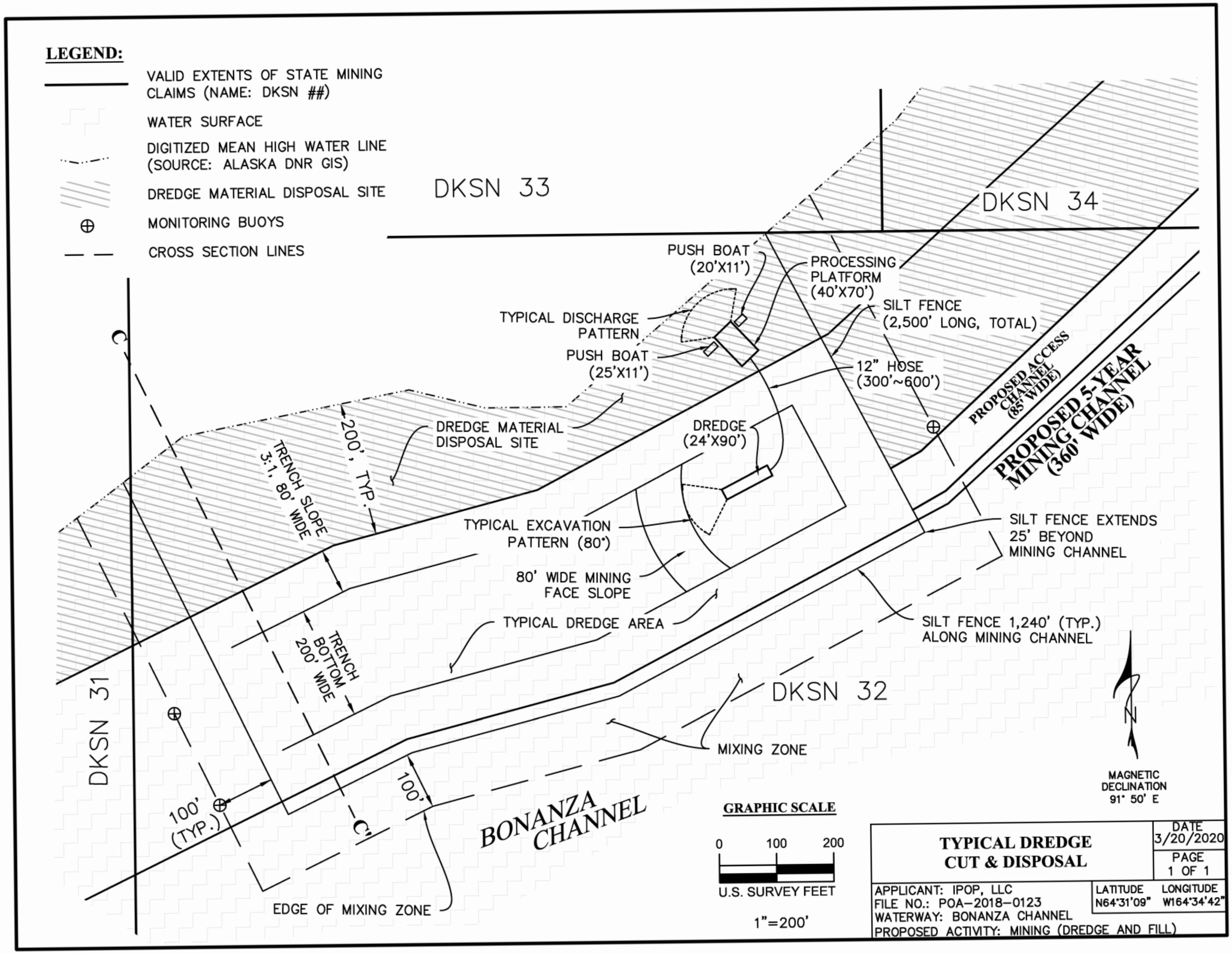
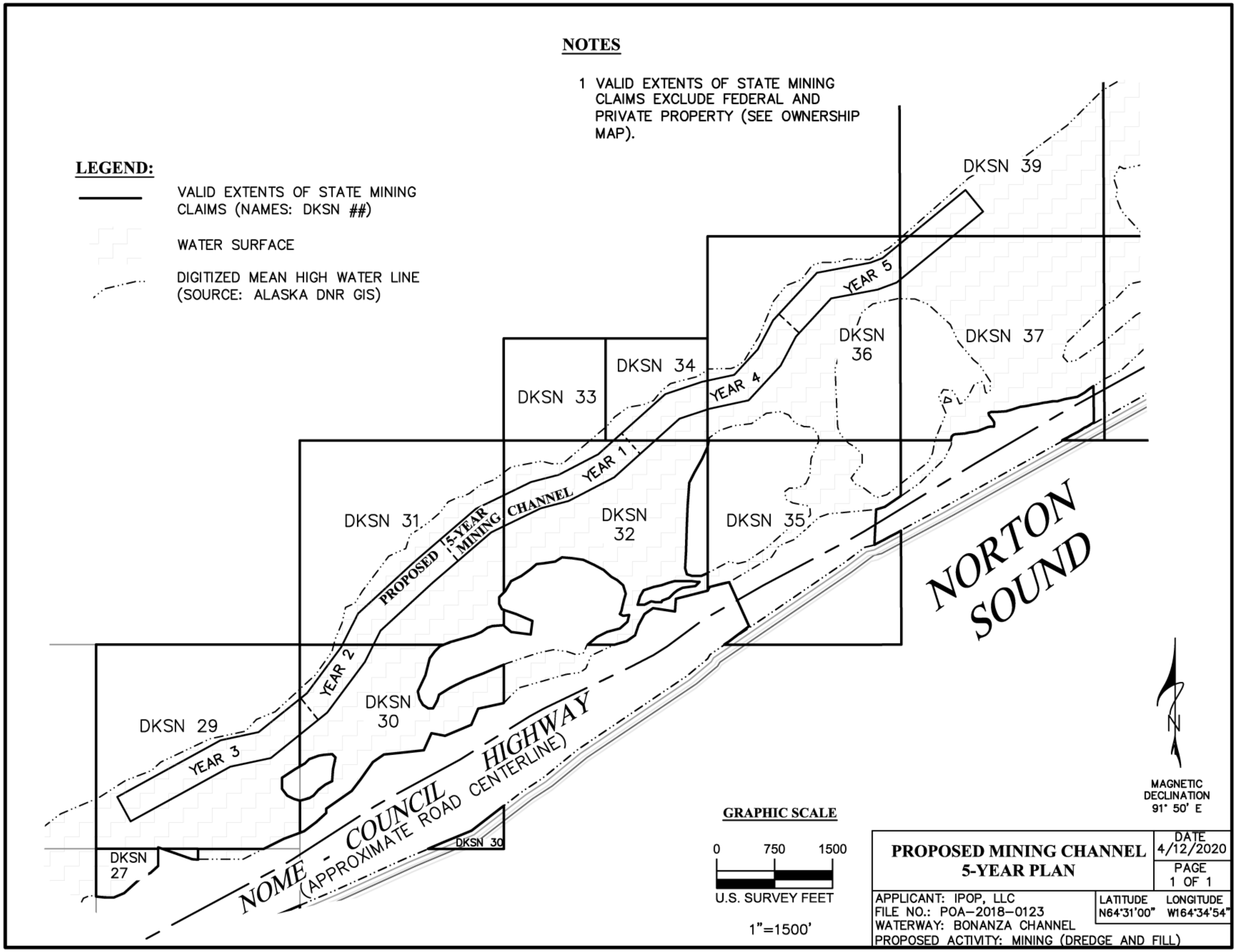


Figure 5-24. Five-year mine layout for IPA (graphic scale is accurate, verbal scale refers to full size printed map)



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)

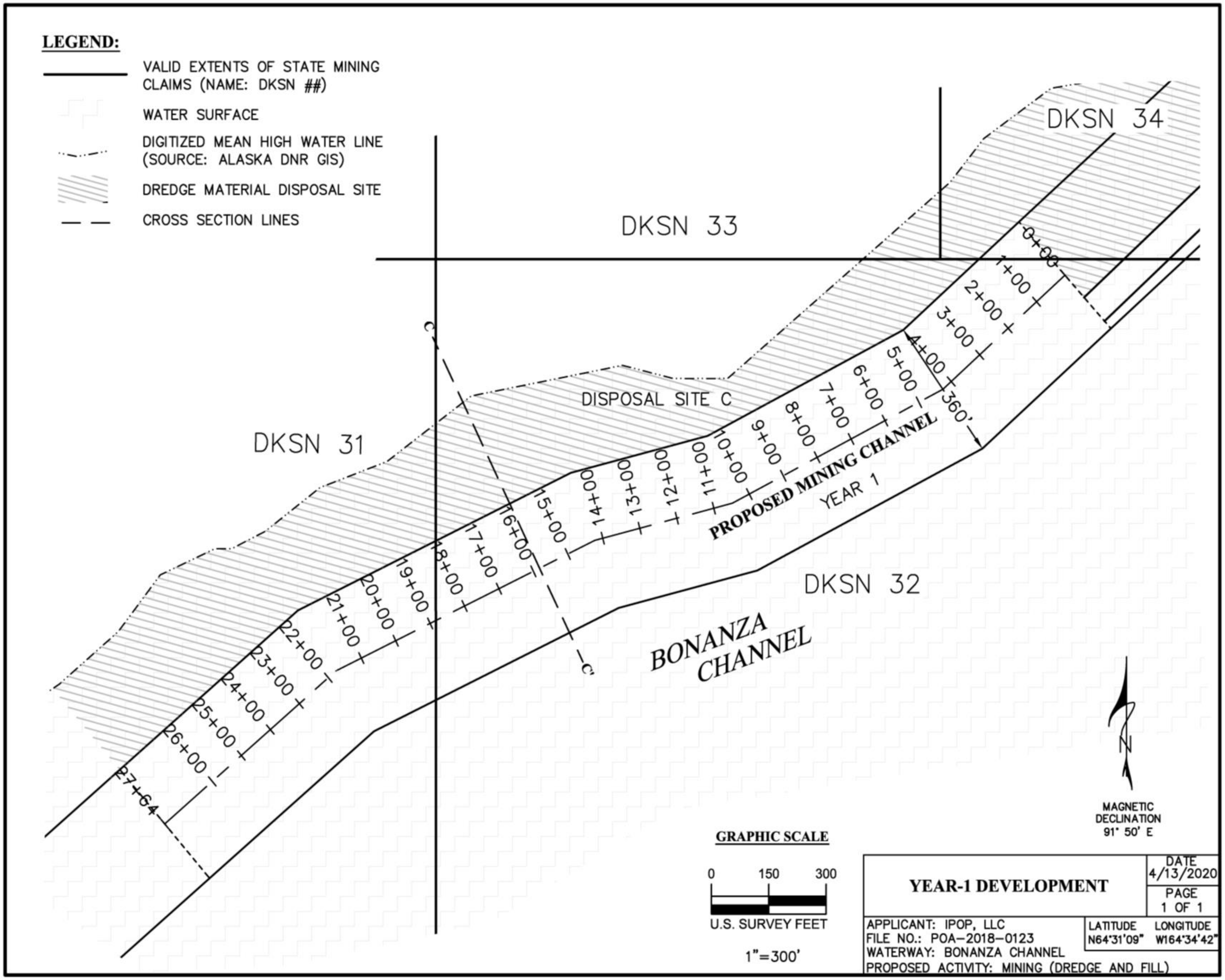


Figure 5-26. Typical dredging and filling stages (part 1) (graphic scale accurate)

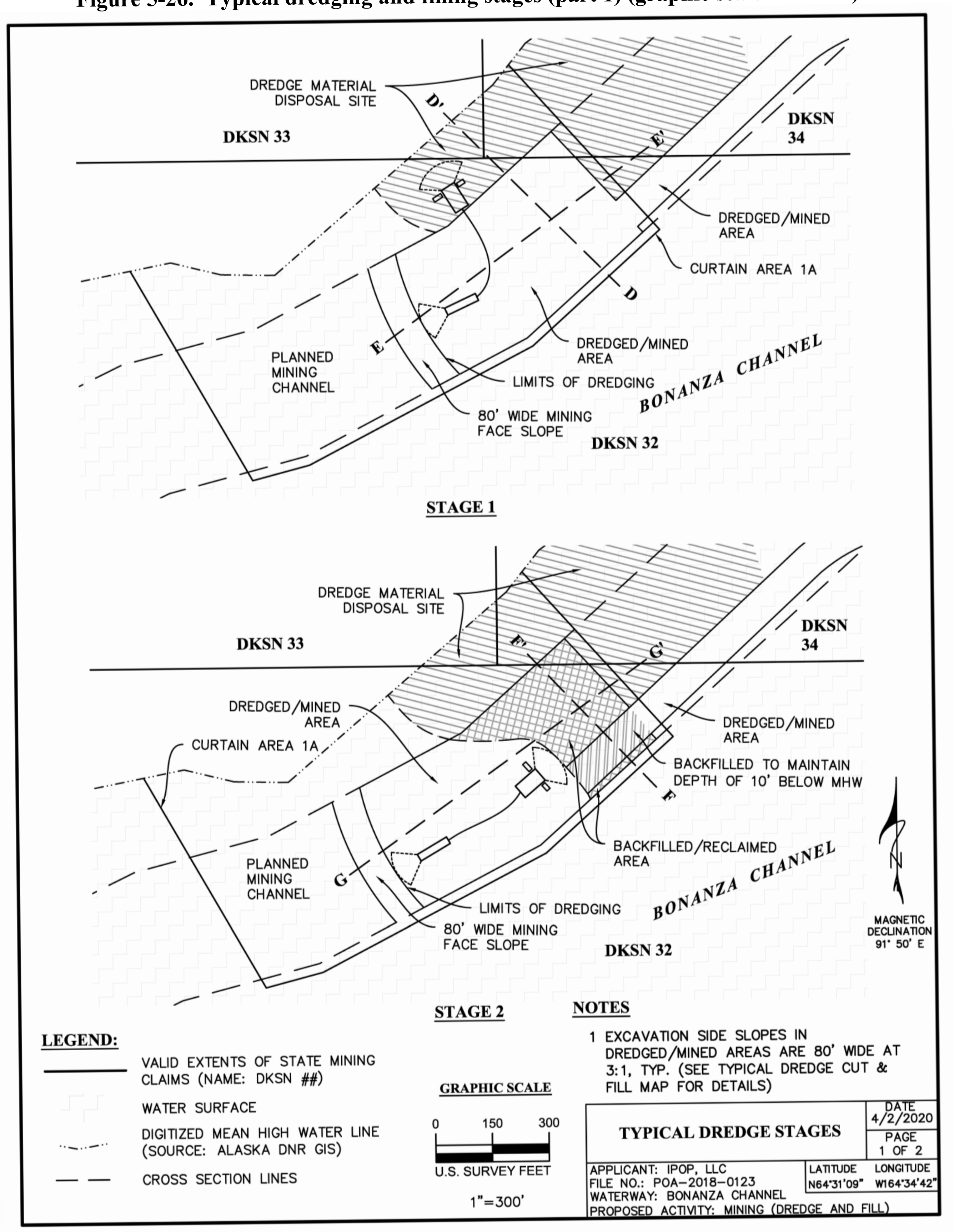


Figure 5-27. Typical dredge and fill stages (part 2) (graphic scale accurate)

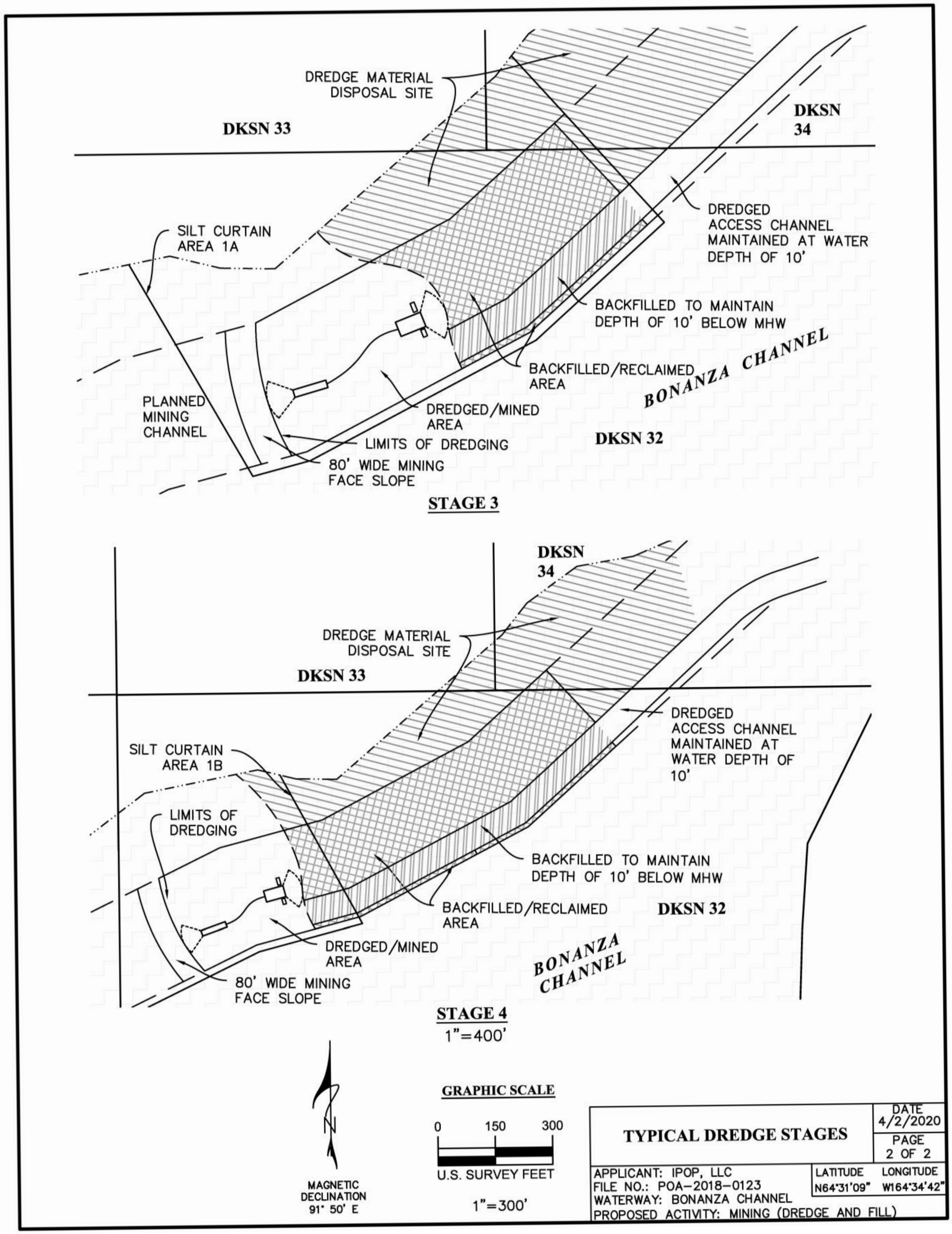
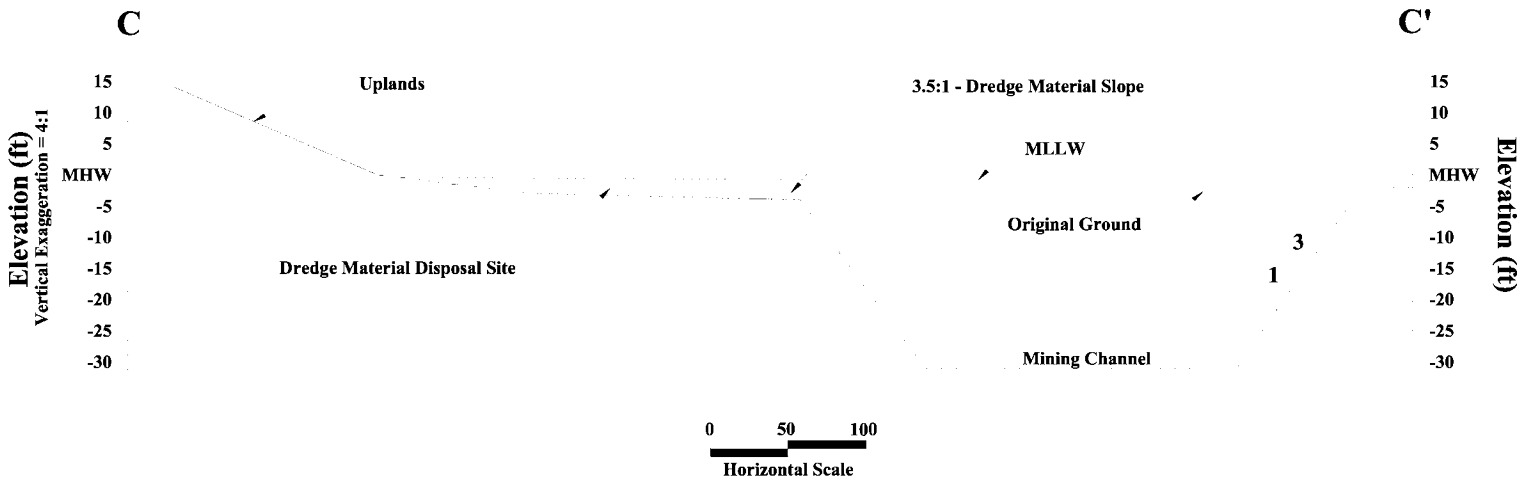
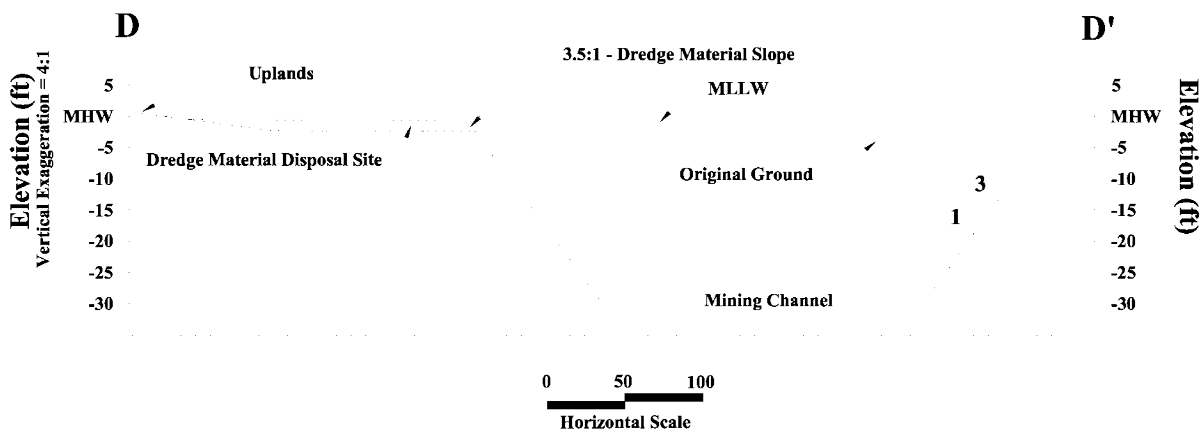


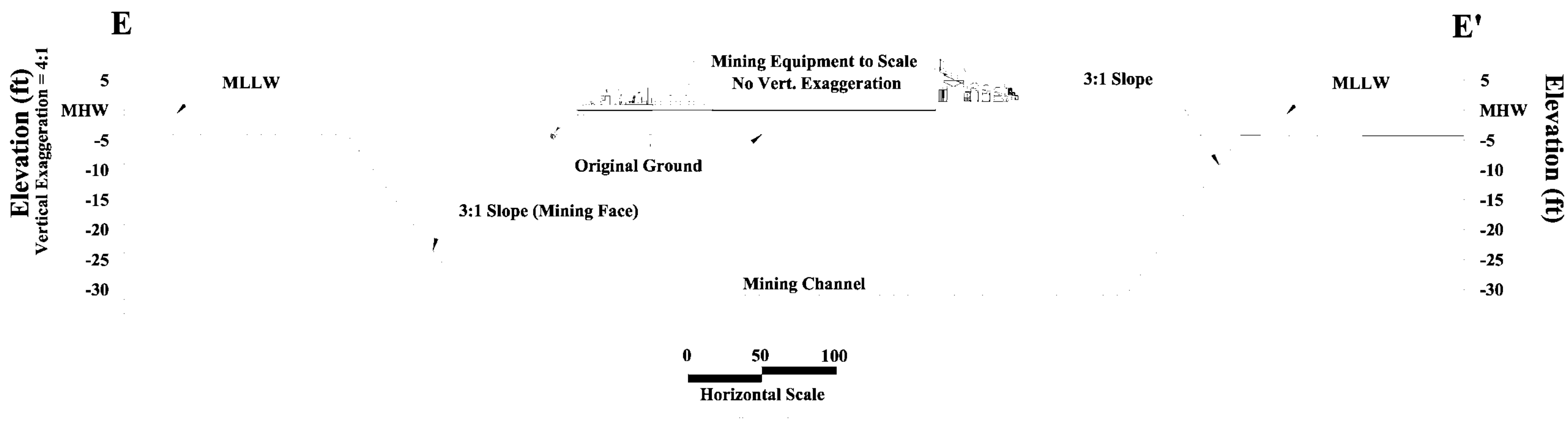
Figure 5-28. Cross sections of typical dredge and fill: C-C' and D-D'

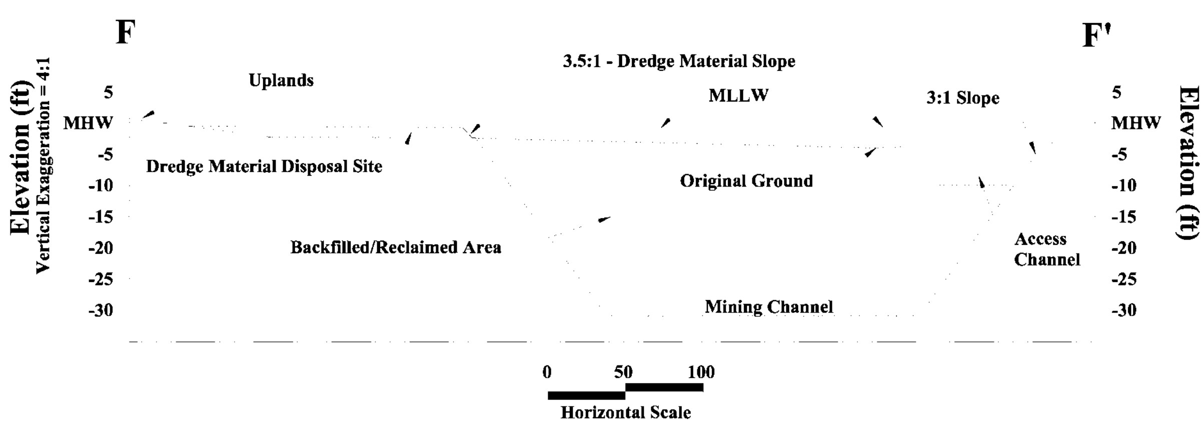




CROSS SECTIONS

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





CROSS SECTIONS

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.

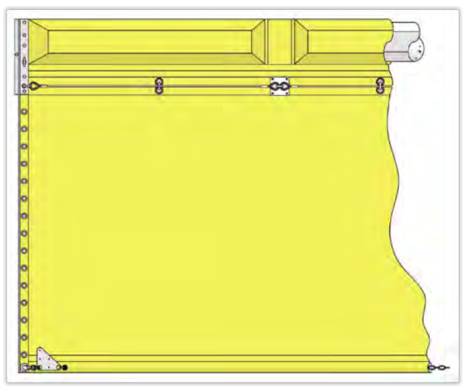
5.10.1 Turbidity Control

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)

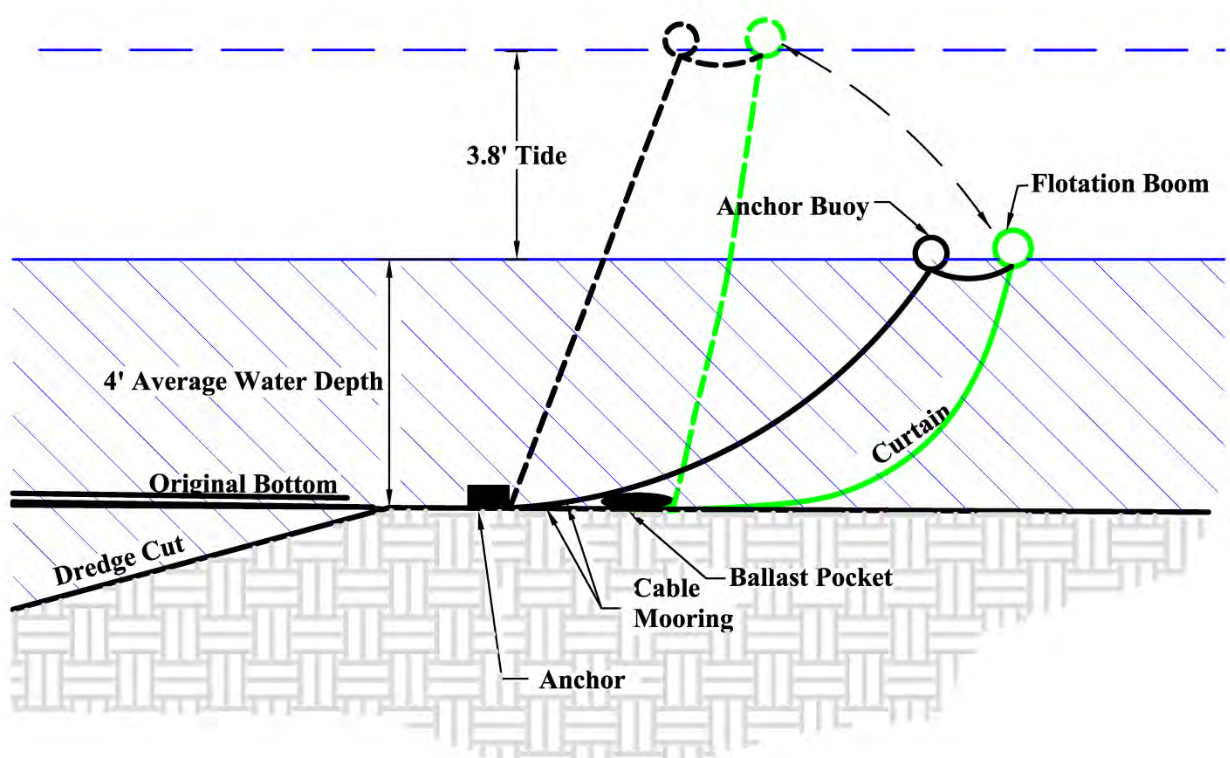
The curtains incorporate furling lines for easy lifting and repositioning of curtain during the operating season. The curtain will also include a small gate over the access channel that can be opened and closed to allow sufficient access and egress for re-supply and personnel transport into the operational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

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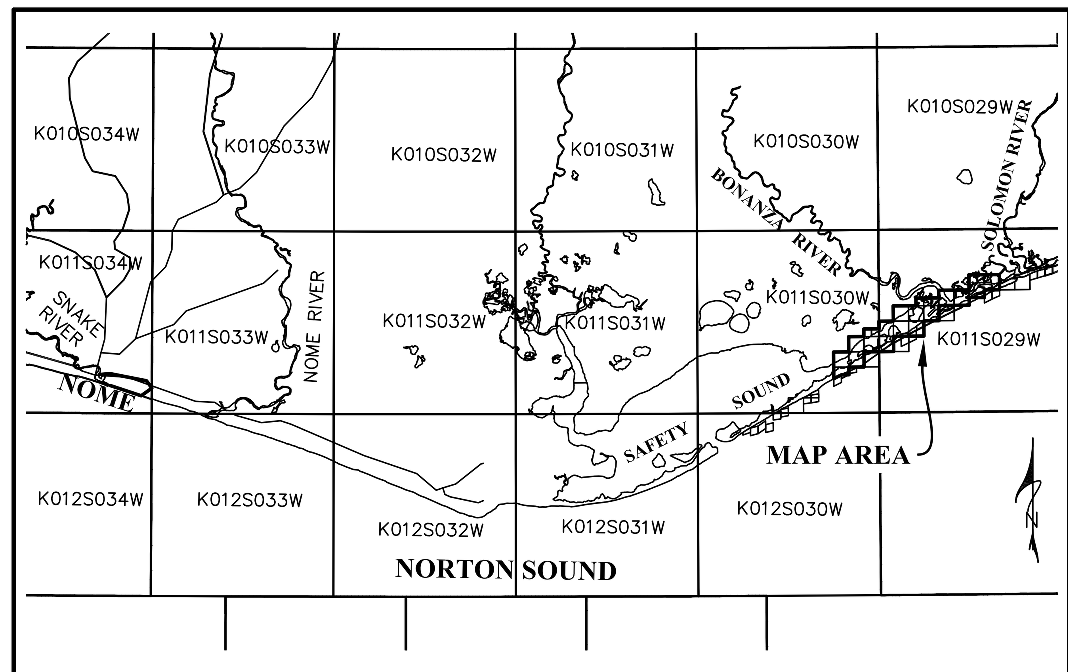
Plate 1

Land Ownership Map



AREA MAP
SCALE: 1"=5 MI.
SOURCE: USGS QUADRANGLES, 1950
0 5mi 10mi

GENERAL NOTES

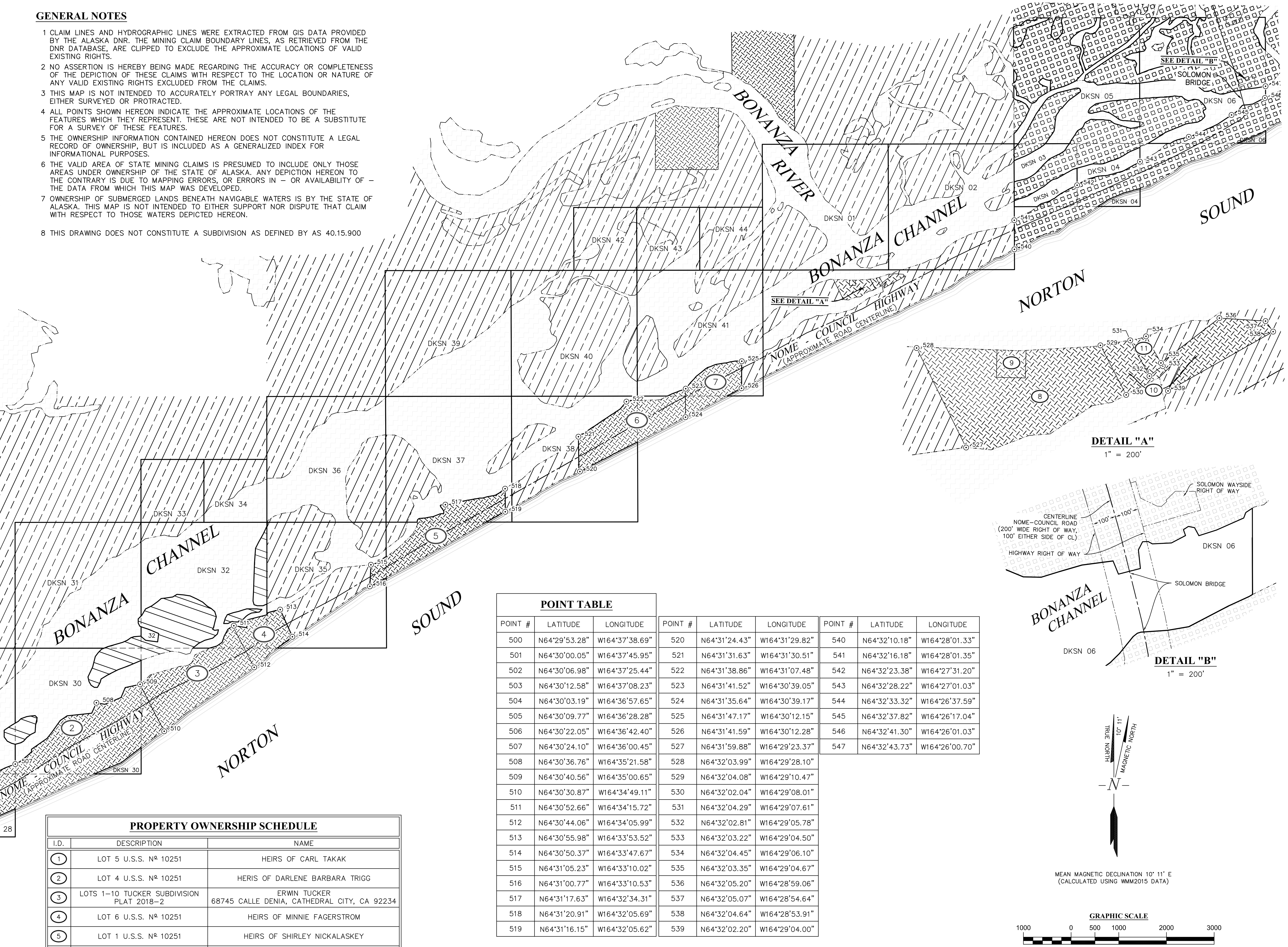
1. CLAIM LINES AND HYDROGRAPHIC LINES WERE EXTRACTED FROM GIS DATA PROVIDED BY THE ALASKA DNR. THE MINING CLAIM BOUNDARY LINES, AS RETRIEVED FROM THE DNR DATABASE, ARE CLIPPED TO EXCLUDE THE APPROXIMATE LOCATIONS OF VALID EXISTING RIGHTS.
2. NO ASSERTION IS HEREBY BEING MADE REGARDING THE ACCURACY OR 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



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

GRAPHIC SCALE
1000 0 500 1000 2000 3000
U.S. SURVEY FEET

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"
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"
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"

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

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

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Checked		