THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Natural Resources
DIVISION OF OIL AND GAS
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December 29, 2016

Mr. Robert Britch
Senior Advisor
Armstrong Energy, LLC
510 L Street, Suite 310
Anchorage, AK 99517

RE: **LONS 16-005, Armstrong Horseshoe #1 2016 - 2017 Winter Exploration Drilling Program Lease Plan of Operations Approval, Exploration Phase**

Dear Mr. Britch:

I. INTRODUCTION

On October 3, 2016 Armstrong Energy, LLC (Armstrong) submitted a request to the Division of Oil and Gas (Division) for approval of a Lease Plan of Operations (Plan) to carry out the Horseshoe #1 2016 – 2017 Winter Exploration Drilling Program (Horseshoe #1), consisting of a single exploration well. The Horseshoe #1 well is located approximately 1,500 feet east of the Colville River approximately 12 miles southwest of Nuiqsuit. Approval of this Plan, along with approvals from other state and federal agencies, is necessary for Armstrong to carry out the Horseshoe #1 Project. Any further exploration is subject to further review and approval by the Department of Natural Resources (DNR).

After state land is leased for oil and gas development, projects currently follow a phased progression. These phases include exploration, development, production and transportation. The Division continually examines effects of oil and gas activities as projects transition throughout each phase. Before the next phase of a project may proceed, public notice and opportunity to comment as well as Division approval is required. Armstrong's proposed operations would begin the exploration phase for the subject project of this review.

II. SCOPE OF DECISION

The DNR Commissioner has delegated authority for approval of Lease Plan of Operations activities to the Division under Department Order: 003 in accordance with Alaska Statute (AS) 38.05 and 11 Alaska Administrative Code (AAC) 83.158. As set forth below, the Division has evaluated the proposed Plan to determine if sufficient information as required by 11 AAC 83.158 is provided. In approving a Plan, the Division may require amendments that it determines are necessary to protect the State's interests (11 AAC 83.158(e)).

This Plan Decision (Decision) will review the Horseshoe #1 well and an associated ice road and ice drilling pad on one oil and gas lease. The exploration well will be slightly deviated with a

true vertical depth (TVD) of approximately 9,000 feet. If necessary, production testing and hydraulic fracturing will be authorized via amendment to this Plan.

The following Plan elements require authorization from other agencies:

AOGCC	Permit to Drill
ADEC	Minor General Air Quality Permit 1
ADEC	Oil Discharge Prevention and Contingency Plan (C-Plan)
ADEC	Temporary Storage of Drilling Waste
ADFG	Habitat Permits
AK Fire Marshall	Fire Permits for Camps
DMLW	Temporary Water Use Authorization
DMLW	Land Use Permit – Ice Roads
DMLW	Land Use Permit – Summer Studies
DMLW	Temporary Water Use
EPA	Spill Prevention, Control, and Countermeasure
NSB	Development Permits and Administrative Approvals
OHA	Archaeological and Cultural Resource Clearance

III. LAND STATUS

The project area is comprised of state lands.

A. Division's Leased Lands: This section refers to Division managed oil and gas leases regardless of ownership of overlying surface lands.

Oil and Gas Lease: ADL 392048
Oil and Gas Mineral Estate Lessee(s): Armstrong Energy, LLC
Surface Ownership and Access Agreement: State of Alaska owns the land within the project area
Special Use Lands: North Slope Area Special Use Lands (ADL 50666)
Jointly Managed Lands: None identified
Other Considerations: None Identified

Project Components	**Meridian, Township, Range, & Section(s)**	**GPS Coordinates**
Horseshoe #1 Drilling Pad, Camp Pad, and Well	Sec. 15 Township 18N, Range 4E, Umiat Meridian	70.04615, -151.1206 (DD)
Ice Road	Sec. 14-15, Township 18N, Range 4E, Umiat Meridian	70.04554, -151.1213 (DD)

B. State of Alaska Surface Lands: This section refers to State owned surface lands where no Division managed oil and gas leases exist.

Oil and Gas Mineral Estate Owner and Relationship with Applicant: N/A
Access Agreement: N/A

Special Use Lands: N/A
Jointly Managed Lands: N/A
Other Considerations: N/A

Project Components	Meridian, Township, Range, & Section(s)	GPS Coordinates
N/A	N/A	N/A

C. Non-State Lands: This section refers to areas where the State does not own the surface land and no Division managed oil and gas leases exist.

Oil and Gas Mineral Estate Owner and Relationship with Applicant: N/A
Surface Ownership and Access Agreement: N/A
Special Use Lands: N/A
Jointly Managed Lands: N/A
Other Considerations: N/A

Project Components	Meridian, Township, Range, & Section(s)	GPS Coordinates
N/A	N/A	N/A

IV. PROPOSED OPERATIONS

The Plan describes the proposed operations in full detail. Set forth below is a summary of the key details.

A. Sequence and Schedule of Events

Project Milestone #	Project Milestone	Proposed Start Date	Proposed End Date
1	Project planning and design	5/1/2016	8/1/2016
2	Project permitting	6/1/2016	12/1/2016
3	Ice road and pad construction	11/1/2016	1/1/2017
4	Mobilization of drilling equipment	1/1/2017	1/15/2017
5	Drilling operations	1/15/2017	4/15/2017
6	Demobilization and winter site cleanup	4/15/2017	4/30/2017
7	Summer site cleanup	7/1/2017	9/1/2017

B. Well Sites

An ice pad will be constructed to accommodate the well and associated facilities and equipment (Appendix A). The drilling ice pad will be approximately 300 feet by 400 feet. Due to terrain considerations and to avoid willows, a food source for local animal species, the ice pad will be irregularly shaped, with an area of approximately 4.5 acres.

Armstrong has requested an exception for the siting of the Horseshoe #1 drilling pad as discussed in Section M below.

The well will be slightly deviated with a true vertical depth of less than 9,000 feet. The well will be similar to that employed in previous exploration wells and designed in accordance with Alaska Oil and Gas Conservation Commission (AOGCC) regulations.

C. Buildings

Several facilities will be used to support Horseshoe #1 and will be located on an ice drilling pad, an ice camp pad approximately 1,600 feet south of the ice drilling pad, or an ice storage pad at the beginning of the Horseshoe #1 ice road. Facilities include a 90-man camp, maintenance buildings and storage containers.

D. Fuel and Hazardous Substances

State and federal regulations require that a number of contingency plans be in place for drilling operations. Details of the facilities, spill risks and potential impacts are provided in these plans. Per the Alaska Department of Environmental Conservation (ADEC) C-Plan, the largest spill source would be from a well blowout of up to 5,500 barrels of oil per day (bopd), other sources include fuel oil tanks, crude oil test tanks typically 500 barrels or less, and main fuel tanks which will be 238 barrels (10,000 gallons) or less. Other oil and chemicals will typically be in 55 gallon drums or other smaller containers. Fuel and chemicals will be placed within secondary containment capable of holding 110% of the volume of the largest tank plus the volume of annual precipitation. Fuel will be transferred in accordance with procedures as outlined in the C-Plan. Drip pans will be placed beneath vehicles and equipment when not in use.

E. Solid Waste Sites

Waste management activities for Horseshoe #1 will be conducted in general accordance with best environmental practices as described in the North Slope Environmental Field Handbook. Armstrong will focus on waste minimization, segregation, reuse and recycling. Solid burnable waste may be incinerated on location per 18 AAC 50.

Up to 2,000 barrels of water-based drilling mud and cuttings may be generated. Waste drilling effluents will be stored onsite in accordance with a temporary storage permit until they are processed or disposed. Drilling wastes will be hauled offsite to an approved disposal facility on the North Slope or disposed of on-site via annular injection as approved by AOGCC. Contractual arrangements are in place with other operators to handle these wastes.

F. Water Supplies

Armstrong will withdraw water from permitted sources to be used for ice road and pad maintenance and construction, drilling, and camp operations. Armstrong estimates that up to 1 million gallons per day will be used for ice road and pad construction, and 100,000 gallons per day for their maintenance. Approximately 5,000 gallons of water per day will be used to support camp operations and up to 20,000 gallons will be required for drilling operations.

Approximately 5,000 gallons of potable water per day will be supplied via existing water supply operations by the North Slope Borough (NSB) each day. Potable water will be stored in tanks

approved for potable water use and handled by potable water approved equipment. Gray and waste water will be hauled offsite for disposal at North Slope Borough (NSB) facilities.

G. Utilities

Rig operations will be self-contained. Power will be generated using generators located on-site. GCI communications towers will be placed on the drilling and storage pads.

H. Material Sites

Due to its temporary, exploratory nature, no material sites will be used as part of Horseshoe #1.

I. Roads

Approximately 18 miles of ice road will be constructed as part of Horseshoe #1. Main roads will be approximately 35 feet wide and spur roads 25 feet wide.

J. Airstrips

No airstrips will be constructed as part of Horseshoe #1.

K. All Other Facilities and Equipment

No other facilities or equipment will be used for Horseshoe #1 activities.

L. Rehabilitation Plan

When drilling and evaluation operations are complete, the well will be either plugged and abandoned or suspended in accordance with AOGCC regulations. Equipment will be demobilized and removed from the pads and any debris or identified contaminated ice and snow will be removed prior to spring breakup in May 2017.

M. Operating Procedures Designed to Minimize Adverse Effects

As part of the exploration phase, Armstrong has consulted with the residents of Nuiqsuit, as well as the NSB on several occasions to minimize cultural and subsistence impacts. Baseline environmental data acquisition was purchased from a previous lessee. Additionally, Armstrong completed archaeological and cultural resource surveys in June 2016. The data collected by these projects has been used to determine the location of ice roads to minimize potential impacts to the surrounding vegetation and hydrology.

Armstrong has required all of its employees to undergo training programs in an effort to minimize adverse effects. At a minimum, these training programs include Incident Command System 100 through 300 training, International Association of Drilling Contractors Well Control, North Slope Training Cooperative Unescorted, and Cultural Resources Training for all employees.

In approving a Plan, DNR may require amendments necessary to protect the State's interest (11 AAC 83.158). The Division has determined that to protect the State's interest, it is necessary to incorporate the 2008 North Slope Areawide Mitigation Measures (North Slope Mitigation Measures). Armstrong addressed these mitigation measures in the application process, but it is necessary to amend the Plan to make clear that the Plan incorporates the North Slope Mitigation Measures.

All plan applicants must complete a mitigation measure analysis demonstrating that each mitigation measure is satisfied or inapplicable to the proposed Plan, or that the applicant is seeking an exception. The North Slope Mitigation Measures allow for the Division to grant an exception if the applicant shows that compliance with the measure is not practicable or that the applicant will undertake an equal or better alternative to satisfy the intent of the mitigation measure. Armstrong completed the mitigation measure analysis for the North Slope Areawide and seeks an exception(s) to the mitigation measure(s) discussed below.

North Slope Mitigation Measure A.1.c:

> *To the extent practicable, the siting of facilities will be prohibited within 500 feet of all fish-bearing streams and waterbodies and 1,500 feet from all current surface drinking water sources. Additionally, to the extent practicable, the siting of facilities will be prohibited within one-half mile of the banks of the main channel of the Colville, Canning, Sagavanirktok, Kavik, Shaviovik, Kadleroshilik, Echooka, Ivishak, Kuparuk, Toolik, Anaktuvuk and Chandler Rivers. Facilities may be sited within these buffers if the lessee demonstrates to the satisfaction of the Director, in consultation with Alaska Department of Fish and Game (ADFG), that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally preferred. Road, utility, and pipeline crossings must be consolidated and aligned perpendicular or near perpendicular to watercourses.*

Armstrong provided the below request and explanation for the exception:

The proposed drilling location is within 200 feet of a presumed fish bearing lake immediately north of the site. The lake appears to be within the floodplain of the Colville River and is about 1,500 feet from the normal channel boundaries. As such, this lake would be subject to periodic inundation from the Colville River introducing fish to the lake during these periods. Armstrong believes that it is impracticable to locate the facility outside of the buffers due to local topography and geology, as well as the presence of willows, an important food source for local wildlife.

The Division, in consultation with ADFG, agrees that it is impracticable to site the drilling location outside of the buffers due to local topography and wildlife. The proposed drilling location is temporary in nature and will be used to drill one well with targets below the Colville River and is not proposed to be used during periods when open water is present at the lake or on the Colville River. Potential releases and other unanticipated impacts are expected to be contained before open water is present and, relative to releases during summer months, more easily contained due to the presence of snow and ice and lack of open water.

The intent of this measure is to prevent hydrocarbons from entering the water system and affecting sensitive habitat and wildlife populations when open water is present. The Division finds that Armstrong has shown rationale that proposed activities in the Plan equally satisfy the intent of this mitigation measure. Armstrong proposes to site a temporary exploration facility within 200 feet of a presumed fish bearing waterbody and within one-half mile of the main channel of the Colville River during the Winter 2016-2017. The Division grants an exception to this mitigation measure to allow for the Applicants alternative as set forth in the Plan.This

exception does not apply to activities that the Applicant may propose in future or amended plans of operations.

North Slope Mitigation Measure A.4.e:

> *Vehicle refueling shall not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.*

Armstrong provided the below request and explanation for the exception:

The location of Horseshoe #1 is within the Colville River floodplain; refueling elsewhere would be impractical. As project activities will be taking place only during the winter exploration season and refueling will be limited to the drilling pad and conducted in accordance with all applicable rules and procedures, any release would be quickly identified and contained well before spring breakup.

The intent of this measure is to prevent hydrocarbons from entering the water system and affecting sensitive habitat and wildlife populations. The Division finds that Armstrong has shown rationale that proposed activities in the Plan equally satisfy the intent of this mitigation measure. Armstrong proposes to refuel within the annual floodplain. The Division grants an exception to this mitigation measure to allow for the Applicants alternative as set forth in the Plan.This exception does not apply to activities that the Applicant may propose in future or amended plans of operations.

The Division has determined that to protect the State's interest, it is necessary to incorporate the North Slope Mitigation Measures as amendments and stipulations to this Plan (11 AAC 83.158).

N. Phased Evaluation

The Horseshoe #1 Project area is relatively close to existing oil and gas infrastructure and Armstrong expects public interest in these activities to be limited. Armstrong will have subsistence representatives onsite during drilling operations to minimize impacts to subsistence users. Should operational issues arise with other industry activities, Armstrong will identify and contact appropriate representatives to avoid conflict.

i. <u>Facilities impacts on the project area.</u>

All proposed facilities are temporary in nature and will be placed on temporary ice pads. Armstrong has designed, sited, and proposes to operate the exploration drilling facilities in accordance with the North Slope mitigation measures. All activities are proposed to take place on temporary ice infrastructure and are intended to avoid and minimize impacts to wetlands. No new gravel placement is proposed for Horseshoe #1. Existing transportation infrastructure and a temporary ice road will be used to transport materials and equipment to the project area. Demobilization of the facilities is expected to occur prior to May 2017 in accordance with North Slope mitigation measure A.1.i. All temporary facilities and waste will be removed and the well will be plugged and abandoned or suspended per AOGCC regulations.

Fuel and hazardous substances potential impacts on the project area

The exploratory drilling proposed under the Plan, as well as other exploratory drilling Armstrong might propose during the exploration phase, will result in drilling muds, cuttings, and produced water and pose some risk of a spill. Discharges of drilling muds, cuttings, and produced waters; oil spills; and accidental spills of fuel, lubricants, or chemicals can all have impacts to water, wildlife, and habitats during this exploration program. Impacts from exploration activities, from either disposal activities or a spill, could adversely affect water quality, but impacts are expected to be local and temporary because of dilution, settling, and other natural altering and regenerative processes. Further, Horseshoe #1 activities are planned to take place during Winter 2016-2017 and conclude before spring breakup. Discharges and accidental spills of hazardous materials will occur while the environment is frozen and are expected to be contained before open water is present.

Drilling Muds and Produced Water

Byproducts of drilling activities include muds and cuttings, produced water, and associated wastes. Produced water contains naturally occurring substances such as clay, sand, oil, water, and gas. Most drilling wastes are disposed of under ADEC's solid waste disposal program. Re-injection is the preferred method for disposal of drilling fluid. Disposal of drilling muds and cuttings requires permit approval. Most oil field wastes are considered non-hazardous and waste fluids are recycled, filtered, and treated before reinjection or disposal. Cuttings and waste fluids must be made non-hazardous before injection. Produced water is treated using heat, gravity settling, and gas flotation devices to remove hydrocarbons. After treatment, produced water is re-injected into either the oil-bearing formation to maintain pressure and enhance recovery or into an approved disposal well. Cuttings disposal is done through grinding and injecting on-site, or cuttings are transported to an approved disposal site. Wastewater, including sanitary and domestic graywater, is also treated to meet effluent guidelines before discharge.

During exploration drilling, muds and cutting are stored on-site, in holding tanks, or in a temporary reserve pit and then hauled to an approved solid waste disposal site or re-injected into the subsurface at an approved injection well. All production muds and cuttings on the North Slope are re-injected into a Class II injection well. All produced waters are re-injected either into the producing formation or into an injection well. The AOGCC oversees proper and safe handling and disposal of drilling wastes and oversees the underground operation of the Alaska oil industry on private and public lands and waters. The AOGCC administers the UIC Program for oil and gas wells, acts to prevent waste of oil and gas resources and ensure maximum recovery, and protects subsurface property rights. All disposal wells inject fluids deep beneath any drinking water aquifers. North Slope mitigation measure A.4.j states that the preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection.

Armstrong's Plan states that waste drilling muds and cuttings will be disposed of on-site by annular injection, or hauled to the PBU Grind and Inject Facility for processing and disposal. To the extent practical, drilling waste will be transported as it is generated. If necessary, Temporary Storage Permits will be obtained from ADEC for the temporary storage of drilling waste. Solid drilling waste may be placed in open-top metal tanks or

shale bins located next to the drilling mud processing units. Waste liquid drilling fluids will be stored in closed tanks. The drilling waste can be pumped out of the tanks/bins and hauled directly offsite for disposal, or temporarily stored onsite in shale bins until frozen prior to disposal. Drilling waste will be transported as it is generated to the extent practicable. After the removal of drilling waste from the storage area, a visual site inspection will be performed to verify that all drilling waste has been removed. A final site inspection report including drilling waste volume and final disposition of waste will be submitted to ADEC as required under 18 AAC 60.430. All drilling waste will be disposed of prior to completion of winter operations.

Accidental Spills

Impacts resulting from accidental spills would depend on the type of product, the location, volume, season, and duration of the spill or leak, and the effectiveness of the cleanup response. Heavy equipment, such as trucks, tracked vehicles, and tank trucks, commonly use diesel fuel, gasoline, motor oil, hydraulic fluid, antifreeze, and other lubricants. Spills or leaks could result from accidents, during refueling, or from corrosion of lines. Fuel and hazardous substances must have secondary containment apparatuses. A secondary containment or surface liner must be placed under all container or vehicle fuel tank inlet and outlet points, and appropriate spill response equipment must be on hand during any transfer or handling of fuel or hazardous substances. Armstrong's Plan states that fuel will be stored in tanks within lined secondary containment or other appropriate fuel storage areas with a containment capacity of 110 percent (110%) of the maximum capacity of the single largest tank or manifolded tanks. Fuel storage, handling, transfers, and spill reporting will be conducted in accordance with the requirements described in Armstrong's C-Plan (11-CP-5194), North Slope Environmental Field Handbook, and Alaska Safety Handbook.

Oil Spills

The effects of an oil spill during the winter are limited due to the short season and temporary nature of Horseshoe #1. There are no production activities, permanent facilities, or pipelines proposed. Armstrong has proposed temporary activities during winter months, and the Division anticipates any future exploratory drilling would also take place during the winter when the risk from spills is lower.

Mitigation measures include development of oil spill contingency plans, and providing adequate spill response training.

North Slope mitigation measures require that: sites be protected from leaking or dripping fuel and hazardous substances; secondary containment be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends during fuel or hazardous substance transfers; containers be marked with the contents and lessee/contractor name; waste from operations be reduced, reused, or recycled to the maximum extent practicable; muds and cuttings be disposed of by underground injection, where practicable; and that proper disposal of garbage and putrescible waste be utilized.

Under North Slope Mitigation Measure A.4.e, vehicles may not be refueled within the annual floodplain without a specific exception from the Division. Because Horseshoe #1 drilling operations will be conducted entirely within the annual floodplain and refueling elsewhere would be impractical, the Division grants an exception to Mitigation Measure A.4.e for Horseshoe #1. This exception is specific only to the Horseshoe #1 2016 – 2017 Winter Exploration Drilling Program and does not apply to any future projects undertaken during the exploration, development, production, or transportation phases.

Armstrong's mitigation measure analysis states that fuel and hazardous substances will be stored at least 100 feet from any water body and no known surface drinking water sources are in the vicinity of proposed project operations (A.4.b); drip pans or liners will be placed under parked vehicles or equipment to capture fluids (A.4.c); surface liners will be used under all potential spill points, Armstrong will verify that adequate sorbents are on hand during fuel transfers, and ensure that personnel are properly trained and understand proper procedures for handling flammable and combustible fluids (A.4.d); all containers with fuel or hazardous substances will be labeled with the contents and lessee's/contractor's name (A.4.f); and solid burnable waste may be incinerated on location. All wastes generated as part of operations will be reinjected or hauled offsite for disposal at an approved facility (A.4.h).

ii. Habitat, Fish, Wildlife and Subsistence

Any exploration activity can impact habitat, fish, and wildlife. The North Slope mitigation measures are designed to minimize these impacts. Horseshoe #1 activities will take place over a limited time period and involve ice roads and temporary facilities. The Division anticipates impacts to habitat, fish, and wildlife will also be limited and temporary. The Division also anticipates that any future Plans for the exploration phase will involve similarly limited and temporary activities and impacts.

Fish

The Colville River is an anadromous stream, supporting the spawning and overwintering of several species of fish that then migrate to nearshore coastal waters to feed in the summer. Migration patterns vary by species and within species by life stage. Potential effects of exploration activities include degradation of stream banks and erosion; reduction of or damage to overwintering areas; impediments to migration; and fish kills due to oil spills. A potential habitat impact at the exploration phase is erosion. Erosion results in siltation and sedimentation, which in turn may result in a reduced or altered stream flow that may affect overwintering habitat availability and the ability of fish to migrate upstream. Protecting the integrity of stream bank vegetation and minimizing erosion are important elements in preserving fish habitat. Streambeds could be affected if stream banks are altered, such as in cases of damage from equipment crossings.

Withdrawal of water from lakes and ponds could affect fish overwintering habitat by entraining juvenile fish, lowering water levels, and increasing disturbance. Removal of water from lakes where fish overwinter may affect the viability of overwintering fish, and longer-term effects of lake drawdown may impede the ability of fish to return to the lake in subsequent years. Removal of snow from lakes may increase the freeze depth of the

ice, kill overwintering and resident fish, and adversely affect the ability of fish to utilize the lake in future years.

North Slope mitigation measure A.2.b requires that removal of water from fish-bearing rivers, streams, and natural lakes have prior written approval by the Alaska DNR Division of Mining, Land and Water (DMLW) and the ADFG. Water intake pipes used to remove water from fish-bearing waterbodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement, with screen mesh size no greater than 1 mm (0.04 inches), unless another size is approved by ADFG. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.1 foot per second, unless an alternative has been approved by ADFG.

Before a permit to appropriate water is issued, DMLW considers local demand and may require applicants to conduct aquifer yield studies. Generally, water table declines associated with the upper unconfined aquifer can be best mitigated by industrial users tapping confined (lower) layers or searching for alternate water sources.

Wildlife

Exploration-related disturbance of caribou is expected to have minor impacts on caribou, particularly large groups, with animals being briefly displaced from feeding and resting areas during drilling operations and when vehicles pass nearby. Vehicle traffic, exploration, development and production activities associated with ongoing oil production, such as activities associated with the Colville River Unit, have the potential to affect habitat use. Acute disturbance effects may in combination result in a cumulative effect on habitat availability for those individuals with fidelity to the Kuparuk-Colville calving areas, but may have little or no effect on the Central Arctic herd population. It is expected these disturbances would be short term.

Moose occur all across the North Slope with the largest concentration along the Colville River and its tributaries. Moose generally remain in the foothills and along river corridors. The Horseshoe #1 drilling pad is near the Colville River and a tributary and may impact the North Slope moose population. Armstrong's Horseshoe #1 program is temporary in nature, consisting of a single exploration ice pad and ice road, and is expected to have minimal effect on the North Slope moose population.

The temporary displacement of some polar bears from preferred habitats may result from routine exploration activities such as the proposed Plan activities and activities Armstrong proposes throughout the exploration phase. Females in dens are at risk for disturbance from any vehicular traffic or drilling noise. Due to its proximity to existing oil and gas infrastructure and location approximately 24miles inland from the coast, Horseshoe #1 is unlikely to significantly increase temporary displacement and disturbance above the level caused by existing oil and gas activities.

Polar bears continually search for food. Once bears find a camp or industrial site, they will often enter to explore and search for food. If a bear receives a food reward, it is more likely to return. Polar bears often investigate not only things that smell or act like food, but also novel sights or odors. Subadult bears are more likely to be food-stressed and

attracted to human activity more commonly than well-fed bears. Subadults are also less likely to leave if a potential food source is present. Attractants include kitchen odors, deliberate feeding, accessible garbage, sewage lagoons, carcasses, industrial materials, and alteration of habitat.

Brown bears can be found throughout the Arctic region in varying densities. The lowest densities occur along the coastal plain; brown bears are at the northern limits of their range in the Arctic. The availability of food is limited and their reproductive potential is low. Brown bears may be subject to disturbance from oil and gas activity. During exploration, human activity may attract foraging bears, especially to refuse disposal areas. Omnivores are attracted to food and food odors associated with human activity, and may become conditioned to non-natural food sources. This may pose a threat to human safety and the potential need to shoot "problem" animals. Bears can also be displaced by human land use activities.

There are several regulations imposed by state, federal, and local agencies that are implemented to avoid, minimize, and mitigate these potential effects to bears. In addition to complying with the Endangered Species Act and the Marine Mammal Protection Act, Armstrong must comply with mitigation measures to minimize effects of exploration activities on bears.

Subsistence

Traditional subsistence uses in the area include: brown bear, caribou, musk ox, and moose harvesting; hunting and trapping of furbearers, such as wolf, fox, weasel, wolverine, and squirrel; hunting migratory waterfowl and collecting their eggs; fishing for whitefish, char, salmon, smelt, grayling, trout, and burbot; collecting berries, edible plants, and wood.

Potential exploration activities that could have effects on subsistence uses in the area include discharges from well drilling, and ongoing disturbances from operation activities such as vehicle traffic. Noise, traffic disturbance, and oil spills generally produce short-term impacts on subsistence species.

The North Slope Areawide Best Interest Finding (BIF) contains several mitigation measures intended to reduce conflicts with subsistence, commercial, and sport harvest activities. Prior to submitting a Plan to the Division, the lessee must consult with affected subsistence communities and the NSB to discuss reasonably foreseeable effects on subsistence during the proposed operations, and methods of proposed operations and safeguards or mitigation measures that can be implemented to prevent unreasonable conflicts. The lessee must make reasonable efforts to assure that the proposed exploration activities are compatible with subsistence hunting and fishing, and will not result in unreasonable interference with subsistence harvests. The Division may implement restrictions, as appropriate, to reduce potential conflicts.

Armstrong's mitigation measure analysis states that Armstrong understands the subsistence interests of local residents. Armstrong conducted a pre-application meeting with the NSB and residents of Nuiqsuit on at least three occasions prior to commencing

activity on the Horseshoe #1 project. Armstrong will need to continue complying with the mitigation measures throughout the exploration phase, and the Division anticipates that any future plans of operations for exploration will include similar measures to address subsistence concerns.

iii. Historic or Archeological sites

While exploring, Armstrong could encounter prehistoric, historic, or archaeological sites. AS 41.35.200 addresses unlawful acts concerning cultural and historical resources. In addition, all field-based response workers are required to adhere to historic properties protection policies that reinforce that it is unlawful to collect or disturb, remove, or destroy any historic property or suspected historic property and to immediately report any historic property that they see or encounter.

Under North Slope Borough municipal code (NSBMC), proposed exploration shall not impact any historic, prehistoric, or archaeological resource before the assessment of that resource by a professional archaeologist (NSBMC 19.50.030(F)). NSBMC 19.70.050(F) says, “Development shall not significantly interfere with traditional activities at cultural or historic sites identified in the Coastal Management Program.” These provisions give the NSB authority to protect cultural and historic resources and current subsistence uses of these sites.

In addition, North Slope mitigation measures require the lessee to conduct an inventory of prehistoric, historic, and archaeological sites within the area affected by an activity. The inventory must include consideration of literature provided by the NSB, nearby communities, Native organizations, and local residents; documentation of oral history regarding prehistoric and historic uses of such sites; evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places; and site surveys. The inventory must also include a detailed analysis of the effects that might result from the activity. A cultural resources survey and inventory was conducted in the project area to identify any prehistoric, historic, or archaeological sites. Armstrong has obtained cultural clearance from the State of Alaska, State Historic Preservation Office North Slope Borough cultural resources department on potential historical, and archaeological resources. Because of the single drilling location and temporary nature of the activity, it is not anticipated that Horseshoe #1 activities would impact cultural, historical, or archaeological resources.

V. CONSIDERATION OF LEASE PLAN OF OPERATIONS REQUIREMENTS UNDER 11 AAC 83.158(c-d) and 11 AAC 83.160

A. Full Payment of Damages to the Surface Owner 11 AAC 83.158(c)

The State owns the surface and full payment of damages to the State are accomplished through a bond posted by the applicant discussed in subsection C below. Thus Armstrong has provided for full payment of damages prior to starting operations (11 AAC 83.158(c)).

B. Plan Sufficiency 11 AAC 83.158(d)

A proposed plan must include statements, maps, or drawings setting forth

(1) the sequence and schedule of operations;
(2) the projected use requirements directly associated with the proposed operations;
(3) plans for rehabilitation;
(4) a description of operating procedures to prevent or minimize adverse effects on natural resources and concurrent uses of the area (11 AAC 83.158(d)).

The information in section IV. Proposed Operations, above, and additional information contained in Armstrong's proposed Plan satisfy the requirements for a plan under 11 AAC 83.158(d) and thus provide the Division with sufficient information available at this time to determine the surface use requirements and impacts directly associated with the proposed operations.

C. Oil and Gas Lease Bond 11 AAC 83.160

Operations will be conducted on state owned land. The proposed well will be drilled into state owned mineral estate. For the State, a lessee provides for payment of damages by posting a bond, and remains liable for full damages under the lease. Armstrong has a Statewide Oil and Gas Bond in the amount of $500,000 and continuing liability under the lease.

VII. CONSULTATION WITH OTHER GOVERNMENT ENTITIES

In reviewing the proposed Plan, the Division considered the fact that Armstrong may require approvals from agencies for other elements of its project. Although mentioned in the Plan and above, these aspects of the project are not operations being approved by this decision and the Division offers no opinion on whether an agency should or should not approve these activities.

In addition to considering the approvals required by agencies as they relate to this decision, the Division provided an Agency review and comment opportunity for the activities proposed for authorization under this decision. The following government entities were notified on 9/22/2016 for comment on the Plan: U.S. Army Corps of Engineers; NSB, Kuukpik Corporation; ADFG; ADEC; and DNR: State Pipeline Coordinator's Section (SPCS), DMLW, and the Division of Oil and Gas. The comment deadline was 4:30 pm Alaska time on 10/6/2016 No Agency comments were received. The Plan was then publicly noticed.

VIII. PUBLIC NOTICE

Public notice of the Plan and opportunity to comment, per AS 38.05.035, was published in the Alaska Dispatch News on October 18, 2016 and the Arctic Sounder on October 27, 2016 with a deadline for comments of November 17, 2016 at 4:30 pm Alaska time. Additionally, a copy of the notice was posted on DNR's web site and faxes of the public notice were sent to the Nuiqsuit and Barrow post office(s). No comments were received.

I. CONDITIONS OF APPROVAL

Having considered the proposed project, the Division approves the Plan as amended and modified by this decision and subject to the below conditions of approval:

To protect the State's interest, the Division finds that it is necessary to amend the Plan to incorporate the following Conditions of Approval:

a) The applicant shall defend, indemnify and hold the State of Alaska harmless from and against any and all claims, damages, suits, losses, liabilities and expenses for injury to or death of persons and damage to or loss of property arising out of or in connection with the entry on and use of State lands authorized under this approval by the applicant, its contractors, subcontractors and their employees.
b) The applicant shall inform and ensure compliance with any and all conditions of this approval by its employees, agents and contractors, including subcontractors at any level.
c) Unless pre-authorized by a general permit, amendments and modifications to this approval require advance notice and must be approved in writing by the DNR.
d) The Commissioner of the DNR may require that an authorized representative be on-site during any operations conducted under this approval. This stipulation is required to ensure that the Divisions of Oil and Gas and Mining, Land and Water meet their statutory responsibilities for monitoring activities taking place on State-owned lands.
e) A status report for the activities conducted under this approval must be filed with this office on May 1 and November 1 each year, from the date this approval is issued and until a final completion report is filed with the Division. If a lessee requests an assignment, a status report must also be submitted during the assignment process. Failure to file in a timely manner may result in revocation of this approval.
    1) Each status report shall include a statement describing and map(s) depicting all operations actually conducted on the leased area as of the date the report is prepared, which includes the location, design and completion status of well sites, material sites, water supplies, solid waste sites, buildings, roads, utilities, airstrips, and all other facilities and equipment installed.
    2) Upon completion of operations, the applicant will submit a completion report which will include all information required of a status report described in (a) above as well as a statement indicating the date of operations completion, any noncompliance with the terms of this plan approval of which a reasonable lessee would have knowledge of, clean-up activities conducted, the method of debris disposal, and a narrative description of known incidents of surface damage.
f) Notification. The applicant shall notify the DNR of all spills that must be reported under 18 AAC 75.300 under timelines of 18 AAC 75.300. All fires and explosions must be reported to DNR immediately. The DNR 24 hour spill report number is (907) 451-2678; the fax number is (907) 451-2751. The Department of Environmental Conservation (DEC) oil spill report number is (800) 478-9300. DNR and DEC shall be supplied with all follow-up incident reports.
g) A certified As-Built survey of the improvement shall be provided within one year of placement of the improvement. This As-Built must be submitted in both electronic and physical format.

To protect the State's interest, the Division finds that it is necessary to amend the Plan to incorporate the following Project Specific Stipulations:

N/A

X. FINDINGS AND DECISION

Having considered the proposed project and based on the foregoing discussion and consideration of issues and conditions of approval, the Division makes the following findings:

1. The Plan provides sufficient information, based on reasonably available data, for the Division to determine the surface use requirements and impacts directly associated with the proposed operations.
2. The Plan includes statements, maps, or drawings setting forth the sequence and schedule of operations, projected use requirements, description of operating procedures, and a plan of rehabilitation designed to prevent or minimize adverse effects.
3. To protect the State's interest and mitigate potential adverse social and environmental effects associated with the Plan, the Division finds it necessary to amend the Plan to incorporate the mitigation measures set forth in the North Slope Areawide Oil and Gas Lease Sale Final Finding.
4. All oil and gas activities conducted under oil and gas leases are subject to numerous local, state and federal laws are regulations with which Armstrong is expected to comply.
5. The people of Alaska have an interest in developing the state's oil and gas resources and maximizing the economic and physical recovery of those resources. AS 38.05.180(a).
6. Alaska's economy depends heavily on revenues related to oil and gas production and government spending resulting from those revenues. The related revenue sources include bonus payments, rentals, royalties, production taxes, income taxes, and oil and gas property taxes.
7. The potential benefits of approving this Plan outweigh the possible adverse effects, which have been minimized through imposition of mitigation measures, conditions of approval, and project specific stipulations, and thus approval of this Plan is in the State's best interest.

Based upon the Plan, supporting information provided by the applicant and the Division's review, determination of applicable statutes and regulations, consultation with other agencies, relevant entities and individuals, public comment, and the above findings related to that Plan, the Division hereby approves the Plan.

Sincerely,

for Kim Kruse
Permitting Section Manager
Division of Oil and Gas

Nathaniel J. Emery 12/29/2016
Date

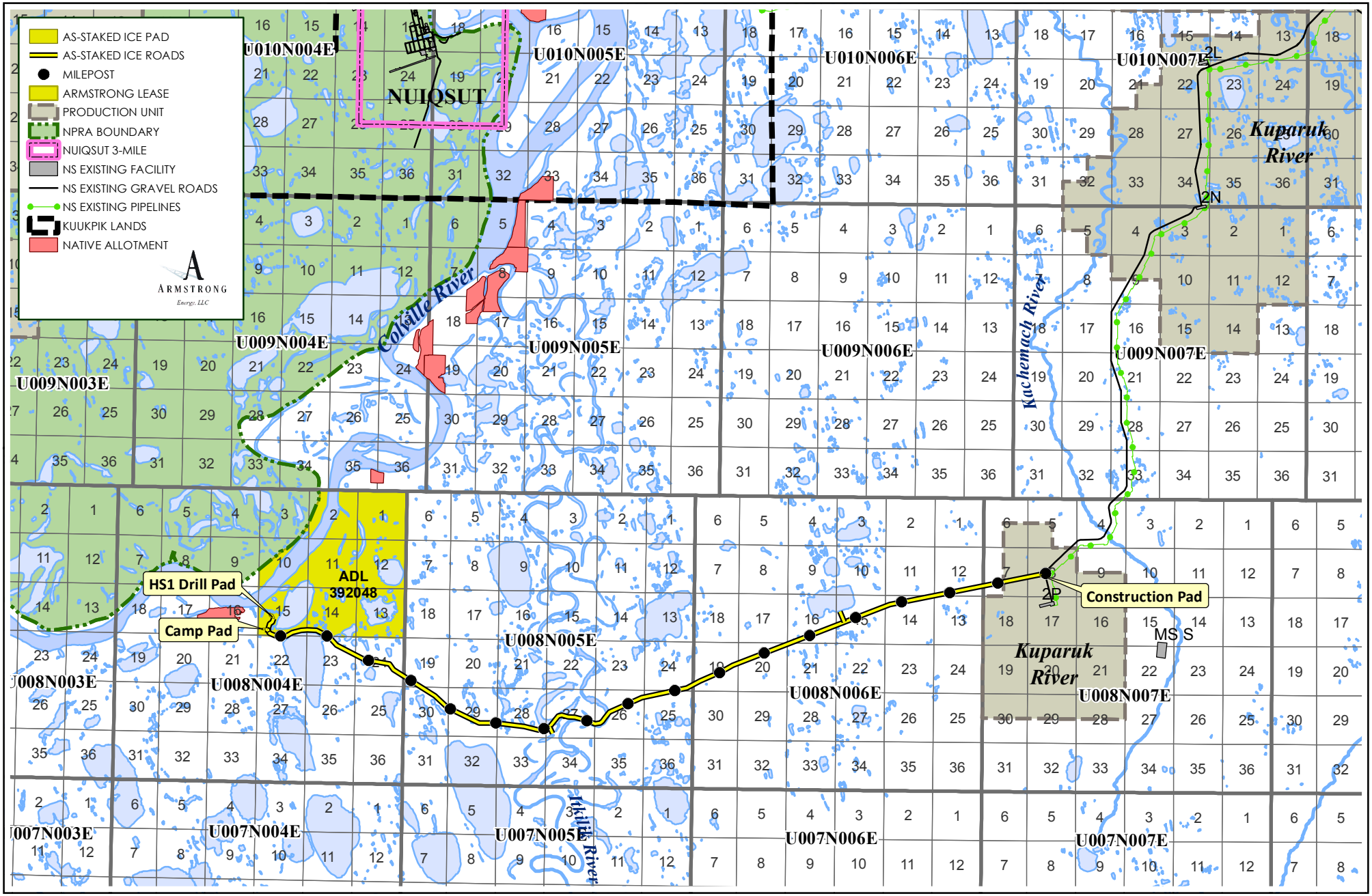
Appeal

An eligible person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received within 20 calendar days after the date of issuance of this decision, as defined in 11 AAC 02.040(c) and (d), and may be mailed or delivered to the Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918; or sent by electronic mail to dnr.appeals@alaska.gov. This decision takes effect immediately. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

Attachments:

Appendix A: Maps and Figure(s)

ecc: DOG: Temple Davidson, Kim Kruse, Nathaniel Emery, Bryan Taylor, Jeanne Frazier, Paul Blanche
DMLW: A.J. Wait, Jeanne Proulx, Melissa Head, Sean Willison, Kimberley Maher, Henry Brooks,
ADFG: Marla Carter, Jack Winters
ADEC: DEC Oil and Gas, Gerry Brown
OPMP: N/A
Borough: Gordon Brower, Thomas Brower III, Rhoda Ahmaogak, John Adams, Bart Ahsogeak, Waska Williams,
Other: Kuukpik Corporation, B. Boyd, P. Munson, USACE



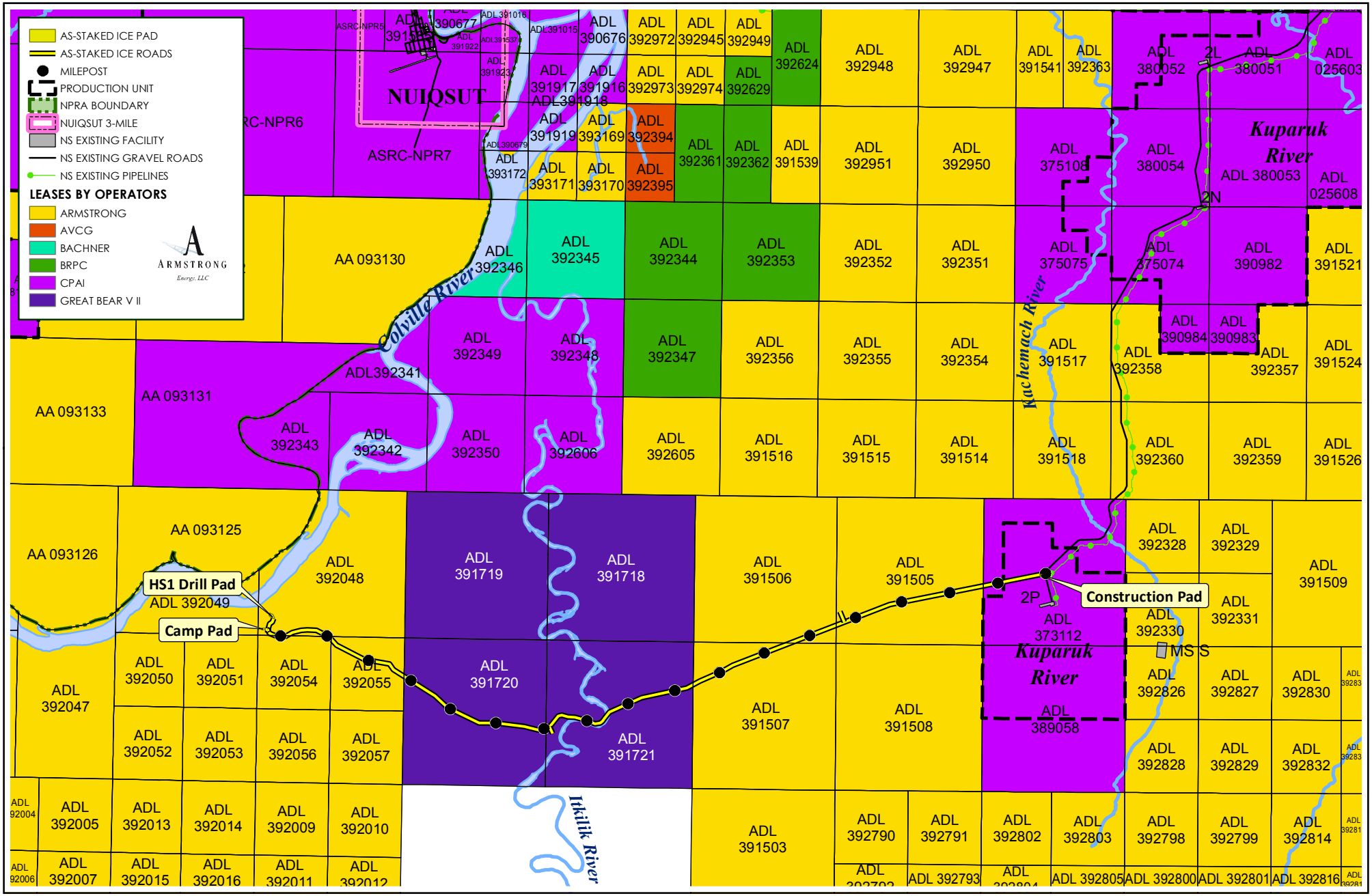
CS: NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet
File: 2016-2017_OS-GEN_IR_winterCampaign
Created on: 12/28/2016. Created by: JB

ARMSTRONG ENERGY LLC
2016-2017 EXPLORATION CAMPAIGN

HORSESHOE EXPLORATION AREA

0 0.5 1 2 Miles
0 0.5 1 2 Kilometers

FIGURE 1-1



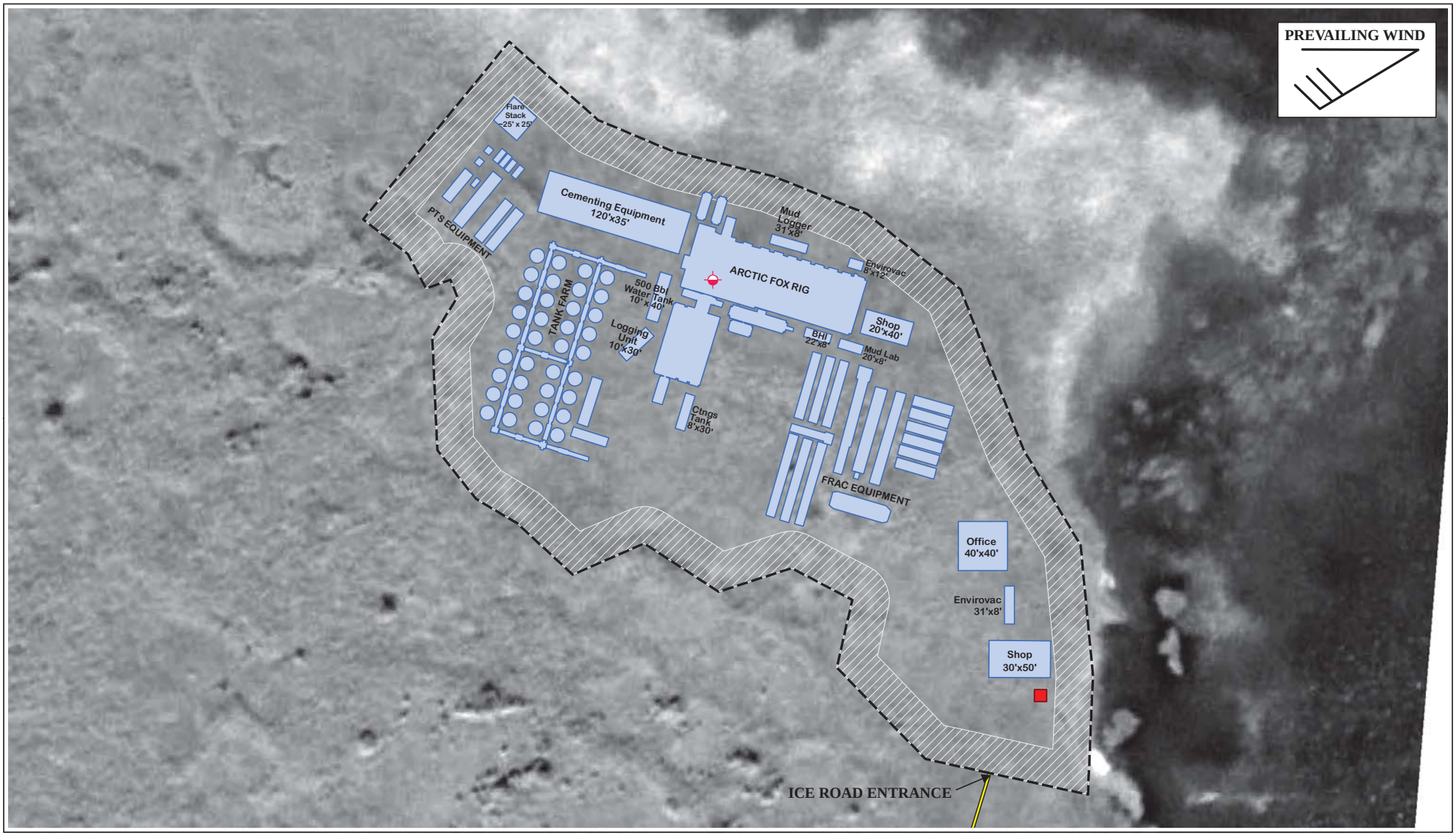
CS: NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet
File: 2016-2017_OS-GEN_IR_winterCampaign_leases
Created on: 12/28/2016. Created by: JB

ARMSTRONG ENERGY LLC
2016-2017 EXPLORATION CAMPAIGN

HORSESHOE EXPLORATION AREA LEASE HOLDINGS

0 0.5 1 2 Miles
0 0.5 1 2 Kilometers

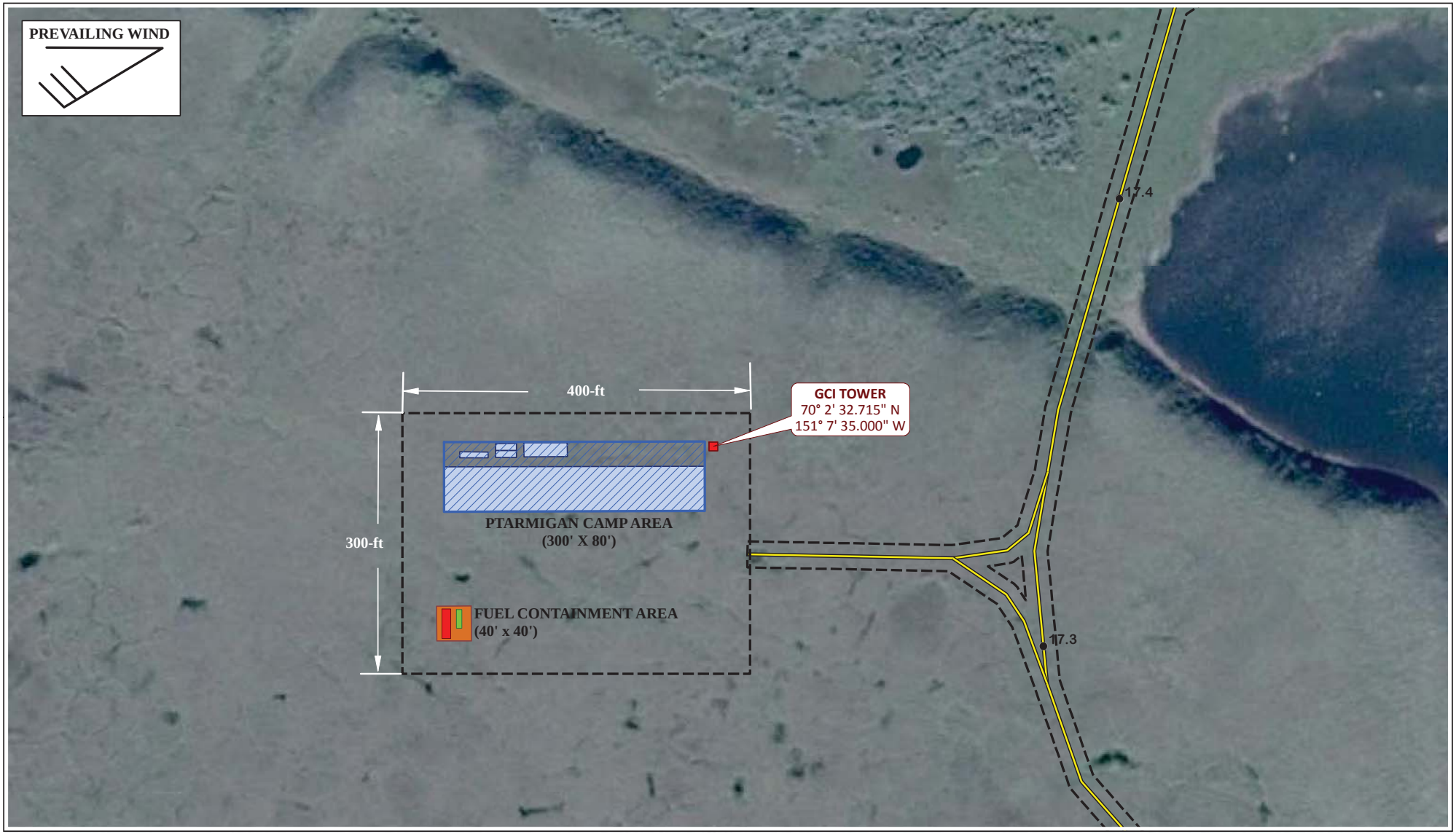
FIGURE 1-2



ARMSTRONG Energy, LLC	ARMSTRONG ENERGY LLC.	HORSESHOE 1 WELL	AS-STAKED ICE ROAD ROUTE	Scale: 0 15 30 60 Feet; 0 5 10 20 Meters
	2016-2017 EXPLORATION CAMPAIGN	EQUIPMENT OUTLINES	30-FT EASEMENT	Coordinate System: NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet
	HORSESHOE 1 ARCTIC FOX RIG OVERVIEW	HORSESHOE DRILL PAD	GCI TOWER	
	By: JB | DATE: 12/21/2016 | 3.4.2 | Sheet 1 of 1			

2016-2017_OS-DTS-LOG-M_HS1_AF_Rig_10.2

FIGURE V.1-2. Horseshoe #1 Pad



ARMSTRONG Energy, LLC

ARMSTRONG ENERGY LLC.			
2016-2017 EXPLORATION CAMPAIGN			
HORSESHOE 1 CAMP PAD LAYOUT			
By: JB	DATE: 11/18/2016	REV: 3.0	Sheet 1 of 1

FUEL CONTAINMENT AREA

FUEL TANK TYPE
- COLVILLE DIESEL
- UNLEADED FUEL

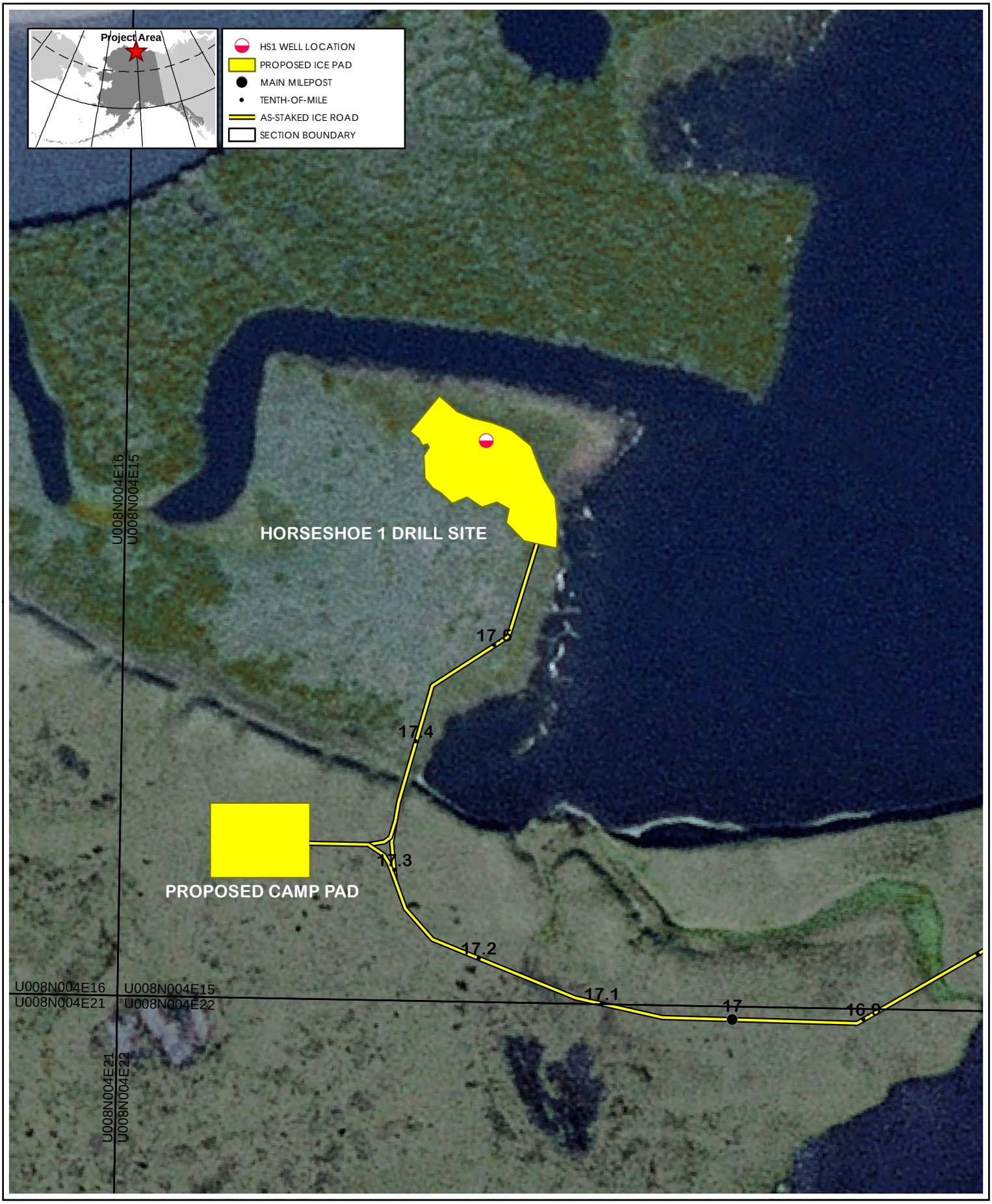
- GCI TOWER (Approx. 10'x10')
- APPROX. STRUCTURE OUTLINE
- PTARMIGAN CAMP AREA (300'X80')
- PAD AND ICE ROAD OUTLINE

- ICE ROAD CENTERLINE
- MILEPOST

Scale:
0 15 30 60 Feet
0 5 10 20 Meters
Coordinate System: NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet

2016-2017_OS-DTS-LOG-M_HS1_CampPad

FIGURE 2



CS: NAD 1983 StatePlane Alaska 4 FIPS 5004 Feet

File Name: 2016-2017_OC-AS-IP-M_HS_CampPad

Created on: 12/2/2016. Created by: JB
Revision: 1.0

Armstrong Energy, LLC

2016-2017 EXPLORATION CAMPAIGN

HORSESHOE CAMP PAD LOCATION

FIGURE 3

0 100 200 400 Feet

0 100 200 400 Feet