Chapter 2

2 Proposed Action and Alternatives

The proposed project includes exploration drilling at five potential sites, testing at a currently suspended well and the possible plug and abandonment (P&A) activities at three locations during a one year winter program in the northeast NPR-A (Table 2.1). The leases for the project are co-owned by CPAI and Anadarko E&P Onshore LLC. CPAI would be the operator of the proposed activity. Recent photographs of the nine possible work locations may be found in Appendix A. The potential testing site, Tinmiaq 6 (Photograph 1) was drilled in 2016, has an existing well head and is in a suspended state. The other five potential sites are Stony Hill 1 (Photograph 2), Tinmiaq 7 (Photograph 3), Tinmiaq 8 (Photograph 4), Tinmiaq 9 (Photograph 5), and West Willow 1 (Photograph 6). Of these five wells only the Stony Hill 1 site is planned for P&A this season. If timing allows, CPAI may P&A previously suspended wells this season to take advantage of the ice road associated with the exploration program. The three currently suspended well sites that are potential P&A sites for this season are Cassin 1 (Photograph 7), Cassin 6 (Photograph 8), and Scout 1 (Photograph 9).

The proposed exploration program would take place in winter 2017-2018, with the drilling schedule contingent upon permitting, weather, ongoing data analysis, and funding. Table 2.2 documents the Notices of Staking dates and field inspections, as required by BLM regulations. Access routes have been identified and field examined. Locations of the drill sites and local access routes are depicted on Figure 1. The proposed schedule is shown in Table 2.3.

Table 2.1 Well Locations

Site Name	Activity	Township	Range	Section	Latitude	Longitude
Cassin 1	P&A	12 North	1 West	28	70.360723 N	152.163779 W.
Cassin 6	P&A	12 North	1 West	27	70.371611 N	152.116945 W
Scout 1	P&A	11 North	1 East	20	70.286865 N	151.962556 W
Stony Hill 1	Exploration Well	11 North	2 West	29 NESE	70.119 N	151.127 W
Tinmiaq 6	Exploration Well	10 North	2 West	10	70.238145 N	152.12104 W
Tinmiaq 7	Exploration Well	10 North	1 West	18	70.214904 N	152.251133 W
Tinmiaq 8	Exploration Well	9 North	1 West	17	70.140623 N	152.215842 W
Tinmiaq 9	Exploration Well	11 North	1 West	18	70.303029 N	152.221433 W
West Willow 1	Exploration Well	11 North	2 West	29	70.275147 N	152.438952 W

Table 2.2 Staking and Field Inspection

Drill Site Name	BLM Lease Case File Number	Notice of Staking (NOS) date	Field Staked	Field Inspection Date
Stony Hill 1	AA093131	September 8, 2017	August 2017	August 11, 2017
Tinmiaq 6	AA081746	2015	2015	August 10, 2017
Tinmiaq 7	AA081810	September 21, 2017	August 2017	August 10, 2017
Tinmiaq 8	AA092673	September 21, 2017	August 2017	August 10, 2017
Tinmiaq 9	AA087891	September 21, 2017	August 2017	August 10, 2017
West Willow 1	AA094422	August 31, 2017	August 2017	August 10, 2017

2.1 Alternative A - Description of the Proposed Action

The proposed project is described below, with main project components summarized in Table 2.3. The proposed project is similar to exploration and P&A programs completed in the NPR-A in previous winter seasons. Details are provided in the Applicant's Plan of Operations, submitted to multiple agencies including the BLM, Alaska Department of Natural Resources (ADNR), and the NSB.

Table 2.3 Summary of Proposed Project

Project Component	Program Total
Ice Pads	Up to nine pads, each approximately 800 feet × 800 feet.
Drilling Locations	Up to 5 Locations
Testing Locations	One Location
P&A Locations	Up to 3 Locations
Construction/ Drilling Support Camps	Maximum Number of People that may be housed in camps is 370 Doyon Rig Camp Maximum 100 people Stallion Camp Maximum of 60 People (Up to 4 Stallion Camps may be used) XBC Camp Maximum 30 people.
Access	Approximately 71.2 miles of Ice Access and an additional 20.08 miles of ice access to lakes. Approximately 30 miles of Snow Trail on BLM Managed Land.
Water requirement	Total of 255.67 MG for the entire project.

2.1.1 Access and Construction

The proposed activity would take place from November 2017 through May 2018, with the actual timing dependent upon field conditions including tundra conditions and logistical issues. The proposed schedule calls for ice pad/road construction to begin in December 2017 through January 2018 (Table 2.4). There are two main areas of exploration planned in NPR-A, the Willow Area (western area) and the Stony Hill Area which is south of Nuiqsut near the Colville River.

The Stony Hill 1 and West Willow 1 locations are located in non-unit areas of the NPR-A. The Tinmiaq 6 (existing), Tinmiaq 7, and Tinmiaq 8 locations are located in the GMTU. The Tinmiaq 9 location is within the BTU; the existing Cassin 1, Cassin 6 and Scout 1 wells are also in the BTU.

CPAI anticipates drilling operations to start in January 2018 depending on when the first pad is accessible via the ice road. The current order of work to be conducted are:

- Tinmiaq 6 testing concurrent with Tinmiaq 7 and Stony Hill 1 drilling
- Tinmiaq 8
- West Willow 1
- Tinmiaq 9
- P&A of existing suspended wells (Cassin 1, Cassin 6 and Scout)

Table 2.4 Estimated Schedule

Activity	Proposed Start Date	Proposed End Date
Pre-Packing of Ice Roads and Pads	November 1, 2017*	December 15, 2017
Ice Road and Pad Construction	December 15, 2017	January 10, 2018
Drilling Rig Mobilization	January 10, 2018	January 15, 2018
Drilling, Completion and Testing, P&A (various wells)	January 15, 2018	April 15, 2018
Drill Rig Demobilization	April 15, 2018	May 1, 2018

***Upon Obtaining Authorization**

Primary access would be by winter snow trail and ice roads. The rolligon route would provide initial access into the NPR-A then drilling rig and equipment access to the proposed exploration wells would be by ice roads (Figure 1). A snow trail (Rolligon route) starting from the Kuparuk drill site 2P pad (DS-2P) (Non-BLM Managed land), would cross the Colville River at, or near, Ocean Point to access drill site locations in the NPR-A (approximately 60 miles in length).

Rolligon units and/or other approved tundra vehicles would be used to transport equipment and personnel to begin prepacking the ice road. A list of equipment to be used for surveying, prepacking and mobilization are shown in Table 2.5. There would be three crews working on the construction of ice roads and ice pads. A list of potential equipment that each crew would use is listed in Table 2.6. CPAI has contracted with Nanuq-AFC and Peak Construction to construct the ice roads this year.

Table 2.5 All-Terrain Equipment List for Surveying, Prepacking and NPRA Mobilization

Equipment	Quantity
Rolligons Tractors with Heavy Haul Trailers	15
Snowmachines	6
Haaglund	2
Tuckers for surveying	2
Terra Gators	3
Bed Truck	1
80 Ton (or Less) Crane	1
30 Man Remote Camp (Canning Camp)	1

Pre-packing of ice roads and ice pads may be required and would be conducted by compressing existing snow with snow machines, rolligons, or smooth tracked tuckers. Side-casting of water on the route may also be conducted; water for side casting would be obtained from permitted sources. Some minor re-routes may be required depending on site specific conditions at the time of construction.

Ice roads would be built using a combination of existing snow, water, and ice chips from approved water sources along the route. Ice roads would generally be 25-35 feet wide and 6-inches thick, depending on drilling rig and vehicle requirements. Rig mats or other similar items may be used on or in the construction of ice roads at selected locations as necessitated by field conditions encountered during ice road construction or during equipment movement. Such devices would be removed prior to the end of the operating season.

Table 2.6 Ice Road and Pad Construction Potential Equipment List

Equipment & Quantity	Equipment & Quantity	Equipment & Quantity
Rolligons (3)	Conventional Water Pump (2)	Snowblower (1)
Envirovac (1)	Terra Gator (3)	300 bbl Water Tankers with Tractor
Fuel Truck (1)	150 bbl. Water Truck (6)	140 bbl. Volvo Water Wagon (Buffalo) (2)
16G Motor Grader (2)	Mechanics Truck (1)	Volvo A35 Rock Truck (25 cy) (2)
966 Loader (4)	Overhead Pump (2)	Maxi Hauls (30 cy) w/Tractor (4)
Trimmer (1)	Light Plant (6)	Ice Road Van/Parts Connex (1)
Pickup (5)	Heater (5)	15 passenger Van/Bus (2)
Tucker (2)	N/A	N/A

CPAI would construct an access ice road to the Stony Hill area from the Alpine Resupply Ice Road that extends south to the Stony Hill 1 exploration drilling location. The Stony Hill ice road would have a total of approximately 6.17 miles of ice road built to access water sources at 28 lakes along the road. Minor variations in ice road routing may occur due to field conditions; however, CPAI would remain within areas that have attained cultural clearance.

CPAI would construct a main access ice road between Greater Mooses Tooth 1 (GMT1) gravel pad and Willow area (Tinmiaq 6). From there, the ice road would branch off to the

various exploration locations. The Willow area access ice road network would have a total of approximately 13.91 miles of ice road built to access water sources at 50 lakes along the road.

Construction of the ice pads would begin as soon as the proposed location can be accessed. Road and pad construction would likely be concurrent. Figure 2 depicts CPAI's typical ice pad layout. The ice pad thickness for the exploration drill sites would be approximately 0.5 to 2 feet, possibly more depending on the topography. Each drill pad would require about 5-10 days to construct.

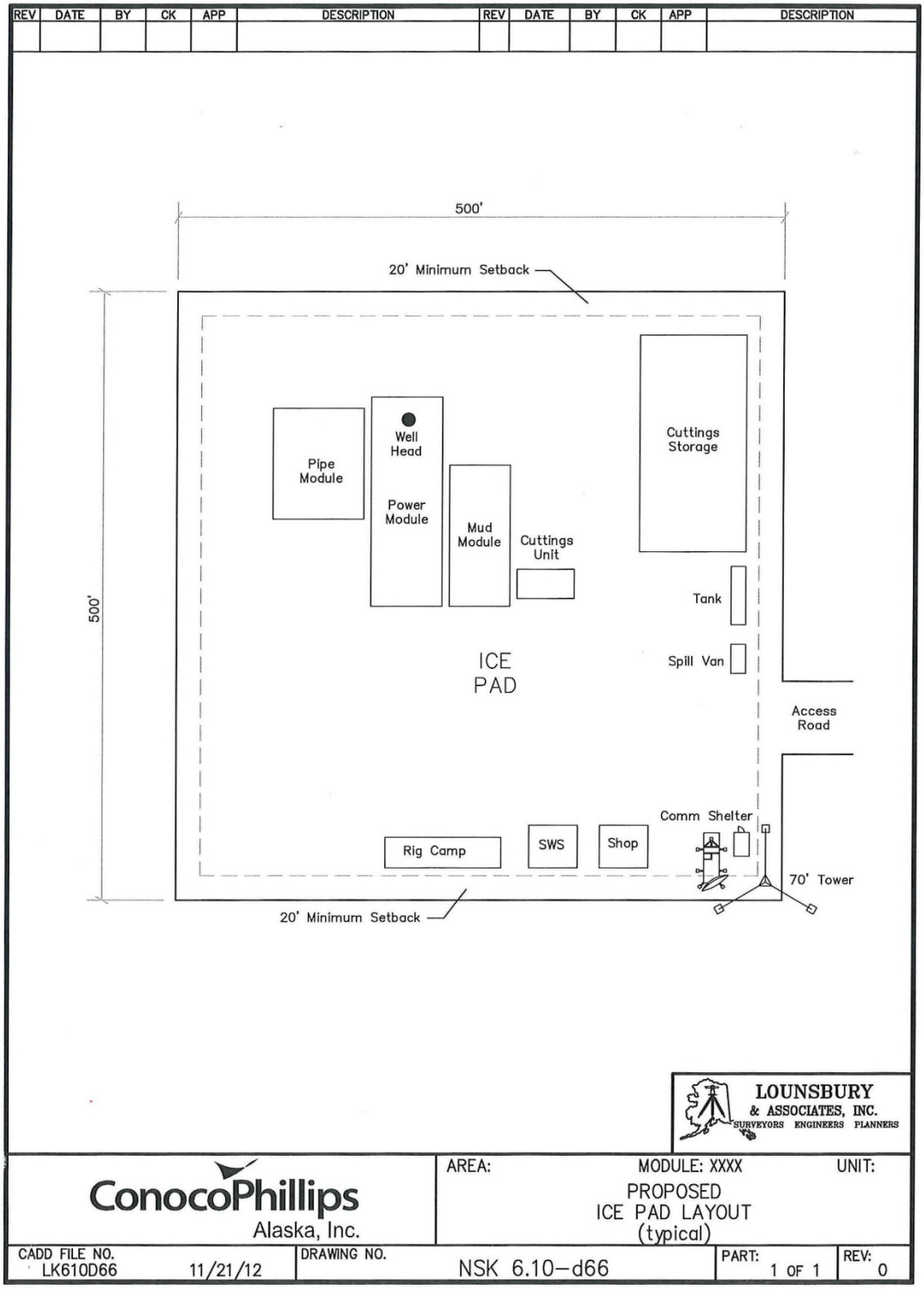

Figure 2: CPAI Typical Ice Pad Layout

The drill pads would be constructed of ice with no cut and fill (i.e., no physical change to the surface topography). Construction of the pad would begin as soon as the proposed location can be assessed.

A cultural resources study for site clearance was conducted in August of 2017 by Reanier & Associates, Inc. to assess any known sites, and to locate currently unknown sites. The results of which were detailed in a letter format to the BLM and include background information on the history of the landscape and human use of the study area since the last ice age, descriptions of the NPR-A exploration area, the results of the reconnaissance survey, and conclusions and recommendations for cultural resource clearances. The records review includes the Alaska Heritage Resources Survey (AHRS) database, maintained by the Office of History and Archaeology within the ADNR; and the Traditional Land Use Inventory (TLUI) database, maintained by the NSB. Sites that exist within the exploration boundary would be protected with a 500-foot radius buffer to ensure no inadvertent damage would occur during exploration operations. No known cultural resources would be affected by the proposed exploration activities

The proposed winter routes (ice road/snow trail) to the exploration well sites are shown on Figure 1; the routing is approximate. Stream crossings for the Rolligon Route are shown in Table 2.7 and Figure 3; stream crossings for Willow Area are shown in Table 2.8 and Figure 4; stream crossings for the Stony Hill area are shown in Table 2.9 and Figure5. Upon completion of use, ice road stream crossings would be slotted, breached, or weakened to facilitate breakup and minimize potential impacts to stream banks. Any snow or ice used as fill for ramps would be removed from banks in a manner that does not disturb the natural stream bank.

The exact route would be within a mile of the proposed routes. This flexibility would allow for potential minor rerouting due to field conditions, animal dens, changes in creek crossing characteristics, or other field conditions. Regulatory agencies would be contacted for approval if final routes are greater than a mile away from those shown in Figure 1. As-built maps of the final routes would be prepared following construction and submitted to BLM.

Ice pullout areas along ice roads or widened sections of ice road may be constructed at certain locations depending on field conditions. These wider ice areas are used to protect the tundra during drill rig moves where heavy equipment is required to help pull the rigs up hills, or to temporarily equipment. Any widened sections of ice road will be documented in the end of season completion reports. All ice road, ice pad, and pullout areas will only be constructed in areas which have previously been cleared for archaeological/cultural resources, and cleared utilizing the NSB's Traditional Land Use Sites Inventory.

Access to the existing operating field via the Dalton Highway is controlled at security checkpoints. The well sites would be closed to the general public for purposes of safety and confidentiality.

Table 2.7 Rolligon Route Stream and River Crossings

Index	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
84	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 8N, R3E , 10	-151.357312	70.05915889
85	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R3E, 34	-151.34947	70.08332608
86	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R3E, 28	-151.385163	70.10139073
87	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R3E, 28	-151.394377	70.10617005
88	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T9N, R3E, 20	-151.443195	70.11251834
89	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T9N, R3E, 19	-151.465697	70.11351059
90	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R3E, 19	-151.494872	70.1147971
91	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R2E , 24	-151.502565	70.11513631
92	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	NIA	T 9N, R2E, 24	-151.520443	70.11592468
93	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R2E, 23	-151.55942	70.11764338
94	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R2E, 22	-151.592982	70.12375188
95	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R2E, 15	-151.623332	70.13090884
96	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R2E, 16	-151.626469	70.13144741
97	NPR-A route to T6 from Ocean Point	Ublutuoch River	NP/NS	N/A	T 9N, R2E, 16	-151.642437	70.13418887
98	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T9N, R2E , 16	-151.643864	70.13439819
99	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R2E, 19	-151.743765	70.11428024
100	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E, 23	-151.803024	70.1217156
101	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T9N, R1E, 23	-151.818957	70.12398315
102	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E, 21	-151.889741	70.12328427

Index	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
103	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E, 21	-151.90498	70.12334483
104	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E , 20	-151.936301	70.12281005
105	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E, 19	-151.962709	70.12468042
106	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E, 19	-151.96406	70.12479442
107	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1E, 19	-151.97702	70.12557721
108	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1W , 24	-152.018076	70.12453955
109	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T9N, R1W, 24	-152.034342	70.12539942
110	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1W, 12	-152.030908	70.14625337
111	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1W , 12	-152.030671	70.1470202
112	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T 9N, R1W , 12	-152.029669	70.14945109
113	NPR-A route to T6 from Ocean Point	Judy Creek	Present/ Surveyed	330-00-10840-2043	T9N, R1W , 2	-152.057634	70.16359355
114	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T9N , R1W, 2	-152.068981	70.16615697
115	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10 N, R1W, 35	-152.068287	70.17980852
116	NPR-A route to T6 from Ocean Point	UNR/S	Present/ Surveyed	330-00-10840-2043-3204	T10N, R1W, 27	-152.103173	70.18684967
117	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W, 27	-152.111003	70.19164442
118	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W, 27	-152.108138	70.19861078
119	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W , 22	-152.105836	70.20404797
120	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W , 22	-152.106324	70.20524555
121	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W , 22	-152.108103	70.20961378
122	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W, 15	-152.110371	70.21518393
123	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W, 15	-152.111653	70.21833132

Index	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
124	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W, 15	-152.113345	70.22248499
125	NPR-A route to T6 from Ocean Point	UNR/S	NP/NS	N/A	T10N, R1W, 10	-152.116153	70.22938062

Key to Table: TRS = Township, Range, Section; UNR/S = Unnamed River/Stream; NP/NS = Not Present/Not Surveyed

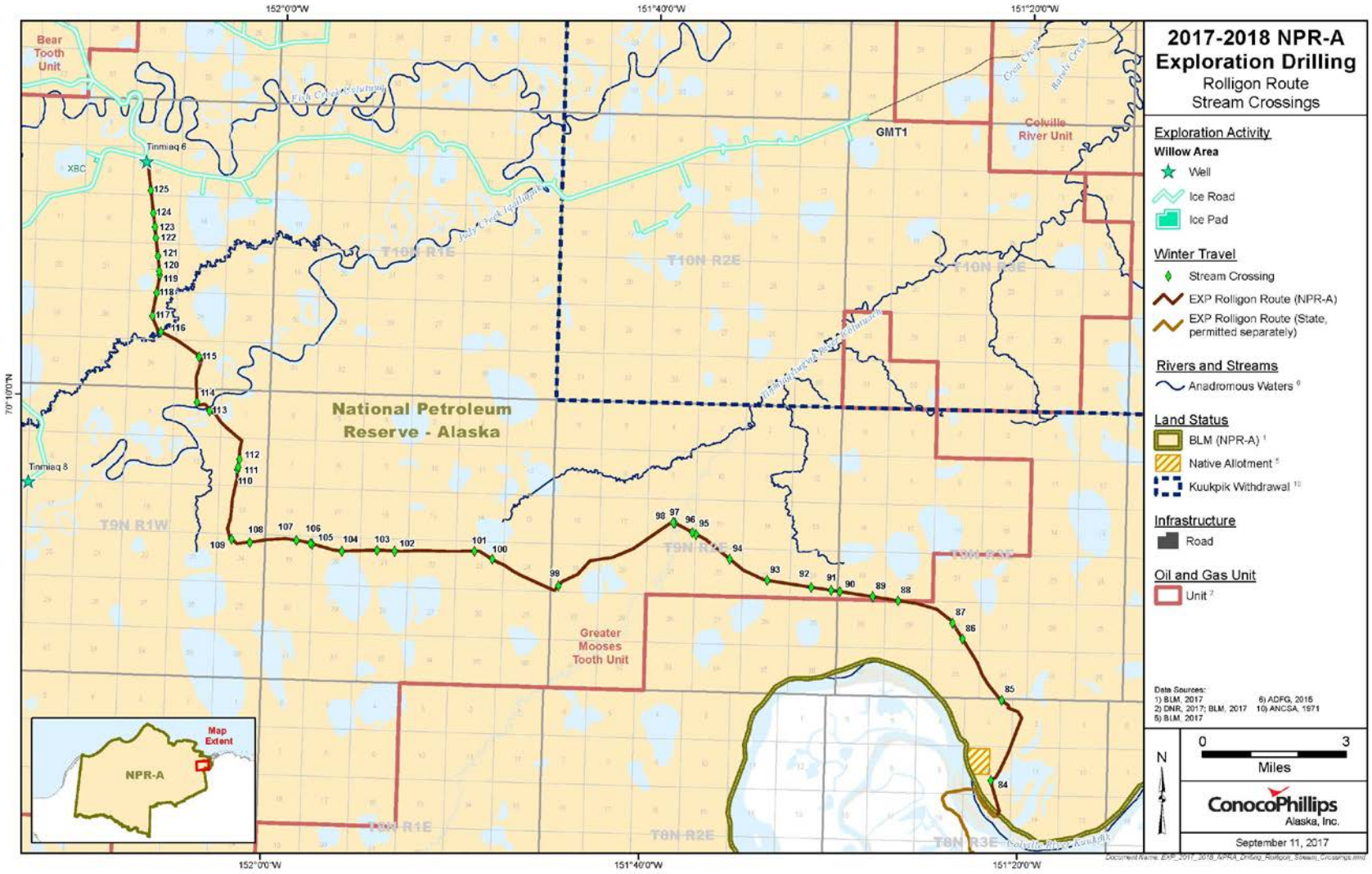

Figure 3: Rolligon Route Stream Crossings Map

Table 2.8 Willow Area Ice Road Stream and River Crossings

Index	Label	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
1	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R3E, 6	-151.49632	70.25591731
2	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	N/A	T10N, R2E, 1	-151.508556	70.25416707
3	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 0N, R2E , 1	-151 .51994	70.25253757
4	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R2E , 2	-151.56318	70.24921508
5	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 0N, R2E,2	-151.574531	70.24917933
6	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R2E, 3	-151.591438	70.24769562
7	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R2E, 3	-151.604255	70.24730371
8	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R2E, 4	-151.63783	70.24430937
9	LSW7	Lake M9914 Lake Spur Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R2E, 9	-151.645295	70.24159328
10	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R2E , 9	-151.653243	70.24206116
11	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R2E , 7	-151 .717284	70.23413265
12	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R2E, 7	-151.728415	70.23273072
13	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	Judy Creek lqalliqpik	Present/ Surveyed	330-00-10840-2043	T10N, R1E, 12	-151.764618	70.23500457
14	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 0N, R1E, 11	-151.800598	70.23251144
15	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 0N, R1E , 11	-151.823576	70.23755458
16	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1E, 11	-151.829999	70.24133846
17	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1E, 2	-151.833285	70.24297405

Index	Label	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
18	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1E, 3	-151.858388	70.24584222
19	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1E, 3	-151.865465	70.24763842
20	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1E, 3	-151.867531	70.24844271
21	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1E, 4	-151.914889	70.2451994
22	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1E, 5	-151.932587	70.24680384
23	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T 10N, R1E , 5	-151.946908	70.24747265
24	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	N/A	T10N, R1E , 6	-152.000718	70.24487572
25	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1E,6	-152.00416	70.24392874
26	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	N/A	T10N , R1W , 11	-152.057266	70.23390799
27	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1W, 11	-152.061271	70.23403447
28	LSW17	Lake M0104 Lake Spur Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W , 11	-152.069598	70.23252792
29	IRW1	GMT1 to Tinmiaq 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W, 10	-152.091897	70.23579243
30	IRW2	Tinmiaq 7**A** Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1W, 9	-152.149917	70.24100343
31	IRW2	Tinmiaq 7A Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W, 9	-152.160139	70.23944542
32	IRW2	Tinmiaq 7A Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W , 9	-152.169396	70.22992167
33	IRW2	Tinmiaq 7A Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1W , 17	-152.192426	70.22758446
34	IRW2	Tinmiaq 7A Access Ice Road	UNR/S	NP/NS	**N/A**	T10N, R1W , 17	-152.202845	70.22671494
35	IRW2	Tinmiaq 7A Access Ice Road	UNR/S	NP/NS	N/A	T10N , R1W , 17	-152.20895	70.22517973

Index	Label	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
36	IRW2	Tinmiaq 7AAccess Ice Road	UNR/S	NP/NS	N/A	T10N, R1W, 18	-152.225899	70.2177041
37	IRW3	Tinmiaq 8 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W , 19	-152.257655	70.20471996
38	IRW3	Tinmiaq 8 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W, 30	-152.25542	70.19820229
39	IRW3	Tinmiaq 8 Access Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R1W, 30	-152.254875	70.19514696
40	IRW3	Tinmiaq 8 Access Ice Road	UNR/S	NP/NS	NIA	T10N, R1W , 31	-152.244734	70.17514306
41	IRW3	Tinmiaq 8 Access Ice Road	Judy Creek - Kayyaaq	Present/Surveyed	330-00-10840-2043-3204	T9N, R1W, 5	-152.207997	70.15977771
42	IRW3	Tinmiaq 8 Access Ice Road	UNR/S	NP/NS	**N/A**	T 9N, R1W, 8	-152.20631	70.15159144
43	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	N/A	T10N, R1W , 3	-152.126964	70.24408435
44	IRW4	West Willow 1 Access Ice Road	Fish Creek - Uvlutuuq	Present/Surveyed	330-00-10840	T11N, R1W, 33	-152.138495	70.25698226
45	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	NIA	T11N, R2W , 35	-152.303865	70.2651691
46	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11N, R2W , 34	-152.354739	70.26574285
47	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R2W, 34	-152.366878	70.26664874
48	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11 **N,** R2W , 28	-152.390199	70.27676328
49	IRW4	West Willow 1 Access Ice Road	UNR/S	Present/Surveyed	330-00-10850-2210	T11 **N,** R2W, 28	-152.398825	70.27638309
50	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11N, R2W , 28	-152.418778	70.27408061
51	LSW40	Lake MM1703 Lake Spur Ice Road	UNR/S	Present/ Surveyed	330-00-10850-2210	T11N, R2W , 28	-152.426562	70.27371435
52	IRW4	West Willow 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11N, R2W , 29	-152.432179	70.27519495
53	IRW5	Tinmiaq 9 Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R1W , 33	-152.174426	70.26419309

Index	Label	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
54	IRW5	Tinmiaq 9 Access Ice Road	UNR/S	NP/NS	N/A	T11 **N,** R1W, 29	-152.190741	70.2770301
55	IRW6	Cassin and Scout short Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R1W, 17	-152.195857	70.30448701
56	IRW6	Cassin and Scout short Access Ice Road	UNR/S	NP/NS	**N/A**	T11N , R1W, 17	-152.179638	70.30538339
57	IRW6	Cassin and Scout short Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R1W, 16	-152.173439	70.30587084
58	IRWB	Cassin 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R1W , 16	-152.171582	70.31413812
59	IRWB	Cassin 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R1W , 8	-152.176521	70.31784564
60	IRWB	Cassin 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 2N, R1W, 28	-152.153717	70.35878217
61	IRW9	Cassin 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 2N, R1W , 28	-152.159363	70.35910161
62	IRW9	Cassin 6 Access Ice Road	UNR/S	NP/NS	**N/A**	T1 2N, R1W, 28	-152.147944	70.36005957
63	IRW9	Cassin 6 Access Ice Road	UNR/S	NP/NS	N/A	T12N, R1W , 28	-152.137125	70.3635412
64	IRW7	Scout 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11N, R1W, 22	-152.095075	70.28654978
65	IRW7	Scout 1 Access Ice Road	UNR/S	NP/NS	**N/A**	T11 N, R1W, 26	-152.065763	70.28178376
66	IRW7	Scout 1 Access Ice Road	UNR/S	NP/NS	N/A	T11N, R1W, 25	-152.010819	70.27375083

Key to Table: TRS = Township, Range, Section; UNR/S = Unnamed River/Stream; NP/NS = Not Present/Not Surveyed

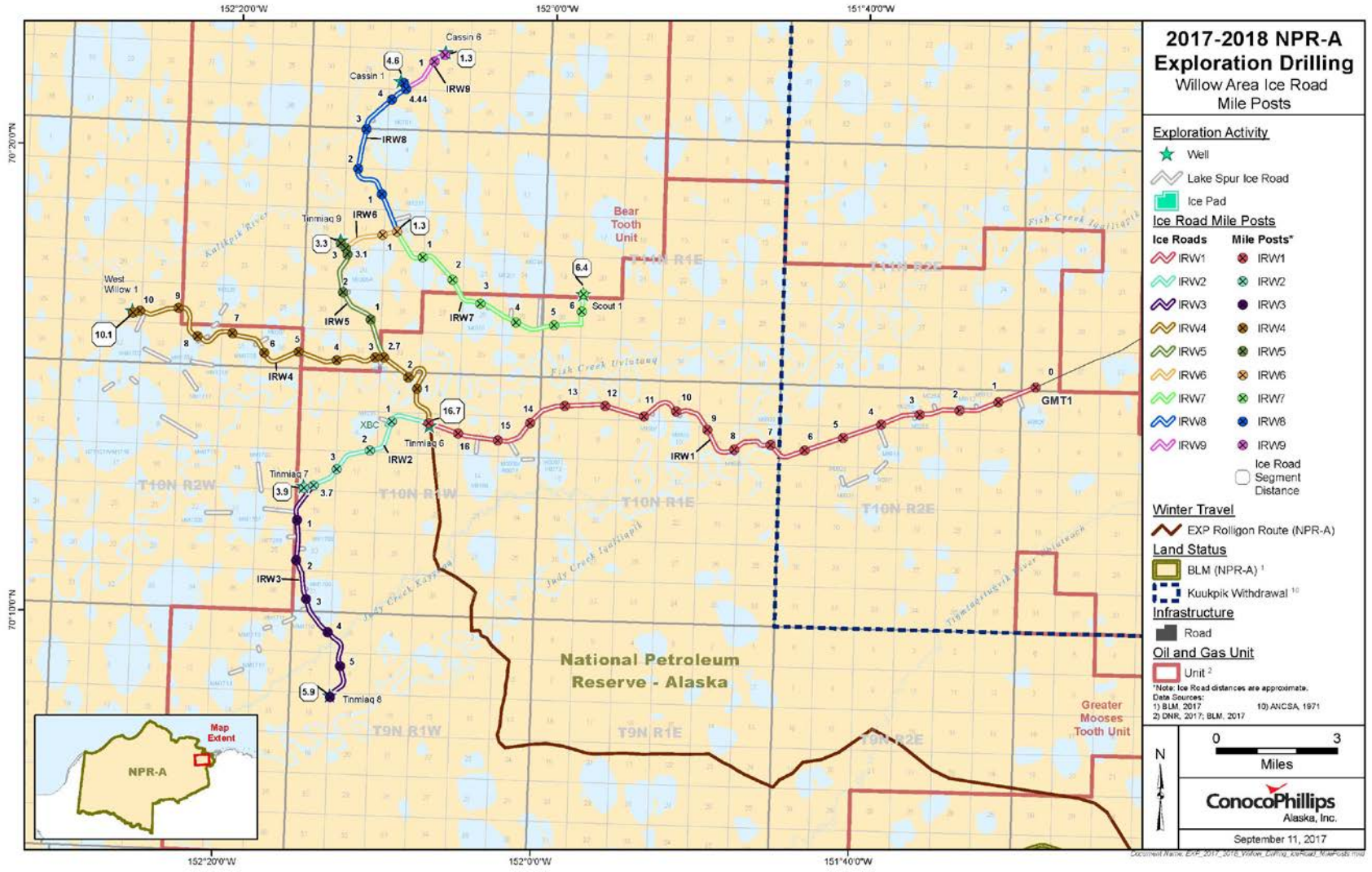

Figure 4: Willow Area Ice Road Stream Crossings

Table 2.9 Stony Hill Area Ice Road Stream and River Crossings

Index	Label	Description	River/ Stream	Anadromous Fish	Anadromous Number	TRS	Longitude	Latitude
67	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T10 N, R4E, 4	-151.152372	70.25285628
68	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T10 N, R4E, 4	-151.157323	70.2529081
69	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T10 N, R4E, 5	-151.168743	70.25302708
70	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T10 N, R4E, 5	-151.195061	70.25020947
71	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	Present/Surveyed	330-00-10840-2017-3163	T10N, R4E , 19	-151.208034	70.21041004
72	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	N/A	T10N , R4E, 29	-151.195905	70.19397609
73	LSS15	Lake M0703 Lake Spur Ice Road	UNR/S	NP/NS	**N/A**	T10 N, R4E, 29	-151.194468	70.18831721
74	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T10 N, R4E, 29	-151.191543	70.18744066
75	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	N/A	T9N, R4E, 16	-151.151449	70.12994202
76	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T 9N, R4E, 29	-151.166248	70.09860157
77	IRS1	Alpine Resupply to Stony Hill Well	UNR/S	NP/NS	**N/A**	T 9N, R4E, 32	-151.161641	70.09800539
78	IRS1	Alpine Resupply to Stony Hill Well	Unnamed River/Stream	Not Present/Not Surveyed	**N/A**	T 9N, R4E, 33	-151.155268	70.09743503
79	IRS1	Alpine Resupply to Stony Hill Well	Unnamed River/Stream	Not Present/Not Surveyed	**N/A**:	T9N, R4E, 33	-151.143675	70.095719,1 4
80	IRS1	Alpine Resupply to Stony Hill Well	Unnamed River/Stream	Not Present/Not Surveyed	**NIA**·	T9N, R4E, 33	-151.136958	70.09622861
81	IRS1	Alpine Resupply to Stony Hill Well	Unnamed River/Stream	Not Present/Not Surveyed	**N/A**	T9N, R4E, 28	-151.116451	70.10634507
82	IRS1	Alpine Resupply to Stony Hill Well	Unnamed River/Stream	Not Present/Not Surveyed	**N/A**	T 9N, R4E, 22	-151.109302	70.11332437
83	IRS1	Alpine Resupply to Stony Hill Well	Unnamed River/Stream	Not Present/Not Surveyed	**N/A**	T 9N, R4E, 22	-151.103047	70.11659637

Key to Table: TRS = Township, Range, Section; UNR/S = Unnamed River/Stream; NP/NS = Not Present/Not Surveyed

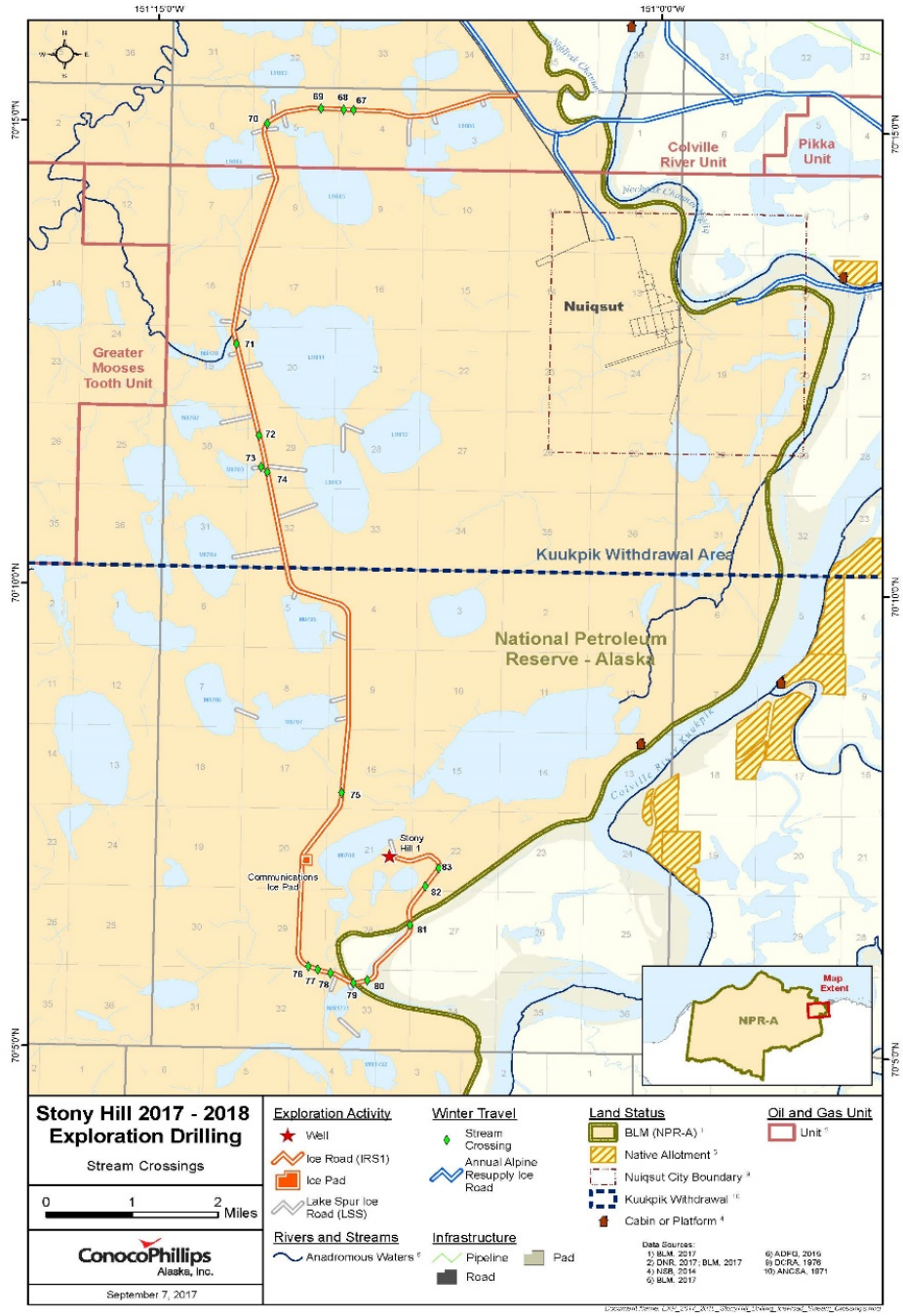

Figure 5: Stony Hill Area Ice Road Stream Crossings

2.1.2 Aircraft

CPAI is proposing to use Lakes M0007 and M0305A as temporary airstrips that would be mainted on non-grounded ice to support their winter operations. The project would utilize CPAI Otter and CASA aircrafts. The airstrips would be prepared by grading the snow on the lake and

setting up necessary lights and equipment. Airstrips would be oriented in northeast/southwest direction and would be of sufficient size required for the aircraft. Lake ice thickness would be checked using ground penetrating radar (GPR) and by ice check augering.

Approximately five flights are planned per week during the exploration drilling season. No refueling would take place on the lakes. There would be no night flights landing or taking off from the airstrips, unless in an emergency. CPAI is requesting to deviate from BMP B-2g to utilize the fish-bearing lakes M0007 and M0305A for airstrips. CPAI would, however, support the objective of BMP B-2g. The aircraft (Twin Otter DHC-6 and a CASA 212) would land on non-grounded ice. CPAI's policy is to land on non-grounded ice because grounded ice imposes a safety risk for aircraft (buckling, heaving). The aircraft would utilize the airstrips for a short period of time during landings and takeoffs and CPAI would rotate the use of the temporary airstrips to avoid impacts to the lakes.

2.1.2.1 Deviation to BMP B-2g request

For CPAI's 2017-2018 winter exploration program in the NPR-A, they are requesting a deviation from BMP B-2g which states:

B-2g Best Management Practice
Objective: Maintain natural hydrologic regimes in soils surrounding lakes and ponds, and maintain populations of, and adequate habitat for, fish, invertebrates, and waterfowl.
Requirement/Standard: Compaction of snow cover or snow removal from fish-bearing waterbodies shall be prohibited except at approved ice road crossings, water pumping stations on lakes, or areas of grounded ice.

CPAI's justification:
Compacted areas on these lakes would be long and narrow (airstrip shaped), and encompass a small area of the total lake/ice surface. Therefore, the total lake/ice surface area and the depth of these lakes along with very narrow compaction of the snow to create airstrips should not have an adverse effect on the overall hydrologic regime of any given lake and should not impact habitat or populations of fish, invertebrates, or waterfowl. No ice chips or water would be used to construct the airstrips, rather the strip would be graded; compaction would be minimal.

2.1.3 Water Use

The freshwater requirements for constructing the project features (ice road/pads construction, maintenance, drilling operations, and camp use) are approximately 255.67 million gallons (MG) (Table 2.10). The fresh water requirement for ice road construction is approximately 1,000,000 gallons per mile of ice road. Each crew can build approximately 1 mile of road per day. Construction of a typical ice pad requires approximately 2,000,000 gallons of water. Seasonal maintenance of snow/ice roads and pads requires approximately 20% of the initial volume of water required to construct the road or pad. As part of the maintenance process, the road or ice pad may be scarified with equipment and biodegradable traction material such as "nut plug" may be applied sparingly to high foot traffic areas to reduce slickness for safety purposes.

Table 2.10 Water Volumes per NPR-A Location

Construction	Gallons per mile/Pad	Total Gallons
Ice Road (~71 Miles)	1,000,000	71,000,000
One Ice Staging Pad XBC Ice Pad	2,000,000	2,000,000
Six Drilling/Testing Ice Pads	3,000,000	18,000,000
Three P&A Pads		6,000,000
Total Construction	--	97,000,000
Operating	**Gallons Each**	**Total Gallons**
Road & Pad Maintenance	--	157,500,000
Rig Use Per Well (6)	20,000	120,000
Remote Construction Camp XBC	7,500	1,050,000
Operating Total	--	158,670,000
Total Estimate	--	255,670,000

Up to an estimated 255,670,000 million gallons of fresh water is needed for the construction and maintenance of ice roads and pads, drilling operations, and camp use (Table 2.10). The ice roads and pads would be constructed of fresh water snow, ice chips, and water and would have a minimum depth of 0.5 feet.

Water for human use would either be hauled from an Alaska Department of Environmental Conservation (ADEC) approved water system or local lake water would be processed through the drilling contractor's ADEC approved water purification system.

CPAI plans to utilize water from previously approved lakes (Table 1.2) and new proposed lakes for this winter's activity authorized under Temporary Water Use Authorization (TWUA) from ADNR-Division of Mining, Land and Water (ADNR DMLW). CPAI has also requested approval to harvest ice aggregate from lakes (See Section 2.1.3.1 Deviation Request). A total of 78 lakes (Figure 6) would be used as water sources (see Table 2.11 for more detail).

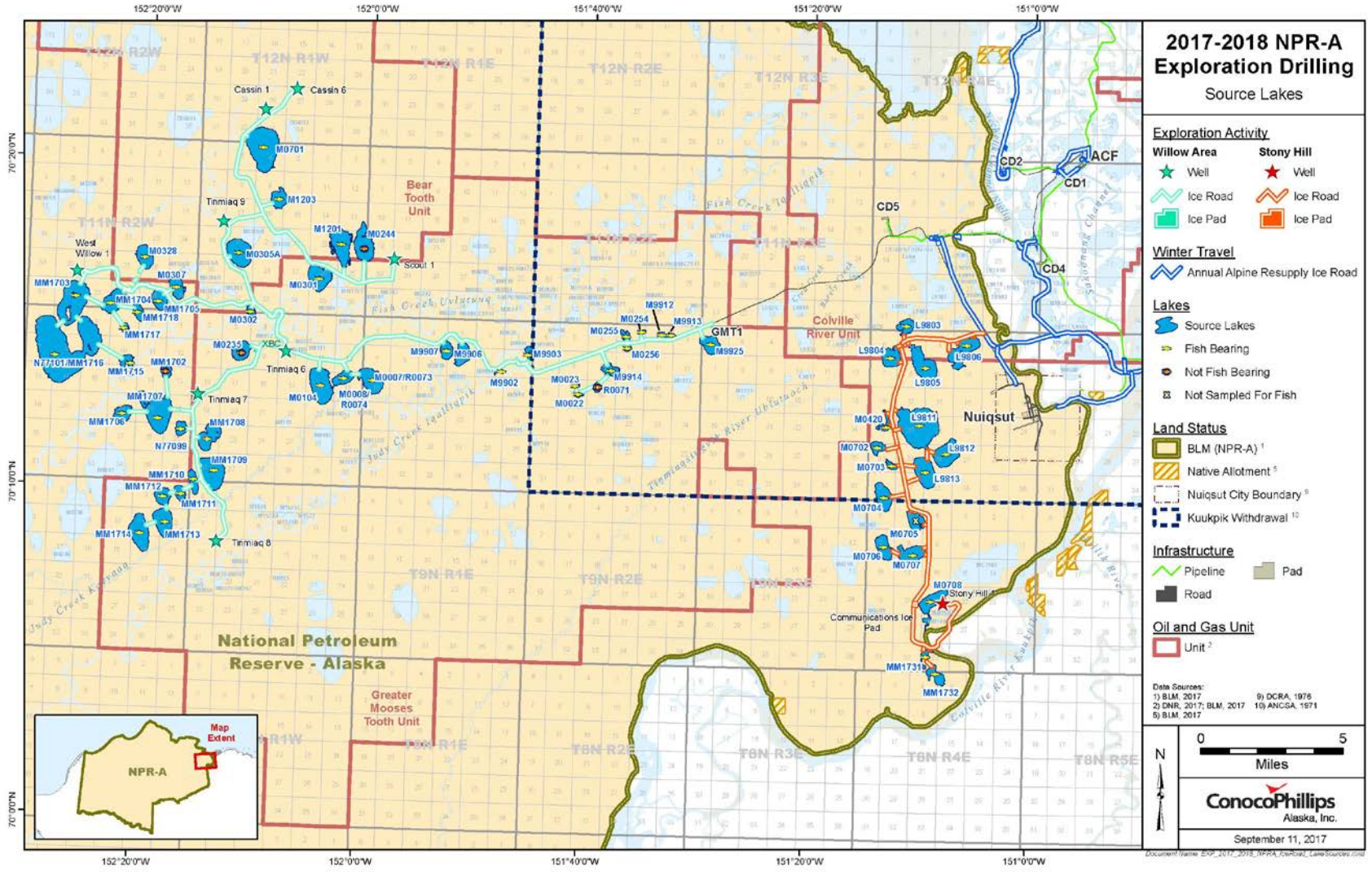

Figure 6: Applicant Submitted Map showing Water Withdrawal Lakes

Water withdrawal from fish-bearing water bodies would be authorized under Fish Habitat Permits from Alaska Department of Fish and Game (ADFG).

Water and ice chips would be pumped from permitted lakes and transported by trucks. All water intake hoses would have screens at the intake points to prevent entrapment of fish, regardless of whether the lake has been identified as fish-bearing. CPAI would comply with ADFG screen designs (including screen mesh no greater than ¼-inch) and would implement 0.5 feet per second or less intake velocity.

Snow cover would be removed from portions of lakes approved for water withdrawal and/or ice mining. The purpose of snow removal is to provide access for water trucks and ice chippers, installation of temporary water houses, and truck turnaround areas. Additional snow removal (beyond the minimal amount required for vehicle access and water/ice withdrawal) is allowed from any non-fish bearing lake and grounded portions of fish-bearing lakes without additional approvals. Snow and ice chip removal from non-grounded portions of fish-bearing lakes must be approved by ADFG-Habitat Division and BLM on a case by case basis.

Lakes would be accessed via snow trail or ice road spurs from the main winter trail using the most direct route possible. Signs would be placed at lake access points to identify each permitted lake that is being actively used. Light plants would be placed on frozen lakes at the water houses and road intersections for safety purposes. Light plants are portable units about the size of a small generator unit with a stand of lights about 10 feet into the air. The light plants would be refueled on the frozen lakes (See Sec. 2.1.6.1) following CPAI's standard procedures for fuel transfers. All light plants would have 110% containment.

2.1.3.1 Deviation to BMP B-2d request

For CPAI's 2017-2018 winter exploration program in the NPR-A, they are requesting to use ice aggregate at ten lakes in addition to the maximum liquid water volume typically allowed for use (Table 2.11), which exceeds BLM's BMP B-2d.

CPAI submitted the following information to support a deviation from B-2d:
In some cases where the specific criteria set forth in BMP B-2 a) through f) are not met, each lake was evaluated based on its documented use by fish, viability and quantity of overwintering habitat, connectivity to nearby streams, and overall drainage area available to recharge the lake each spring. In each case, the corresponding water volume request is for ice aggregate only, the withdrawal will not reduce fish overwintering habitat, and the overall volume requested is low enough that annual recharge is anticipated to occur rapidly each spring. Each of these lakes has been identified clearly in the lake withdrawal request tables and a justification for how the request will meet the objectives of B-2 has been provided.

Specifically, 10 lakes have been requested for use at overall volumes in excess of the standards in B2- a through c. However, for each lake, only ice aggregate collection is proposed. Of those lakes, 3 are shallower than 4 feet deep and are used seasonally by stickleback but are not deep enough to provide fish overwintering habitat. Each has been requested for use of ice only at less than 20% of total lake volume, which is

consistent with BLM standards for assuring recharge and not affecting fish habitat. Three additional lakes used by ninespine stickleback have maximum depths in the 5 to 6 foot range and have minimal if any viable overwintering habitat based on evaluation of overall acreage of potential wintering habitat. To ensure potential overwintering habitat is not degraded only ice is requested from these lakes and would only be harvested from grounded ice areas of the lakes shallower than 4 feet deep. Total volume of water requested for removal as ice is 6% of total lake volume or less, which is well below the 35% criteria for recharge only. Potential overwintering habitat would not be degraded, and recharge would occur each spring.

Two additional lakes used by sensitive and resistant fish species have been sampled adequately by fyke net to support that they are not used substantially, if at all, by sensitive fish species for overwintering, likely based on limited overall habitat availability. Requested water removal as ice only from grounded portions of the lakes would not reduce potential overwintering habitat and volume removal would be less than 10% of total lake volume at each, which would recharge rapidly each spring.

One additional lake with sensitive and resistant fish species use likely does provide viable fish overwintering habitat. To ensure protection of that habitat, only ice would be removed from the lake, in portions of the lake shallower than 4 feet deep and grounded at the time of collection. Water volume removed as ice only would be 5% of the total volume. The lake is part of a substantial tundra stream/lake system and would be recharged rapidly each spring.

Only for one lake where a deviation is requested was recharge capacity difficult to ascertain from available imagery data. The lake is 5.5 feet deep and used by ninespine stickleback only. The only portions of the lake deeper than 5' are in isolated pockets and likely provide little overwintering habitat. We have requested to remove ice only from this lake and from areas shallower than 4 feet deep and grounded at the time of collection. Withdrawal volume, as ice only, would be less than 15% of total lake volume, consistent with BLM recharge only criteria of 35% in non-fishbearing waters. The requested use would not reduce fish habitat and would likely be recharged during spring.

Table 2.11 Water and ice Withdrawal Requirements by Source (BLM managed lands only)

Lake ID	Latitude (N) (N/AD83)	Longitude (W) (N/AD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured [a]	Resistant Fish Species Captured [b]	15% of Water Under 7 ft of Ice (MG) *	30% of Water under 5 ft of Ice (MG) *	35% of Water under 5 ft of Ice (MG) *	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?
L9803	70.25889	-151.18904	6.7	161	176.5	None	Ninespine stickleback	N/A	0.44	N/A	0.00	8.91	Yes
L9804	70.24263	-151.21213	5.2	244	236.0	None	Ninespine stickleback	N/A	0.00	N/A	0.00	17.44	Yes
L9805	70.23779	-151.15888	5.7	435	430.0	None	Ninespine stickleback	N/A	0.01	N/A	0.00	26.34	Yes
L9806	70.24957	-151.09729	6.8	362	423.2	None	Ninespine stickleback	N/A	14.63	N/A	10.2438	4.3902	No
L9811	70.20844	-151.16652	8.0	1034	1414.1	Arctic grayling, Broad whitefish	Ninespine stickleback	0.94	N/A	N/A	0.6552	0.2808	No
L9812	70.19413	-151.12577	8.1	384	501.2	None	Ninespine stickleback	N/A	9.74	N/A	6.8187	2.9223	No
L9813	70.18487	-151.15671	6.3	391	433.9	Arctic grayling	Ninespine stickleback	0.00	N/A	N/A	0.00	17.01	Yes
M0420	70.20733	-151.21644	6.0	126	91.0	Arctic grayling, Broad whitefish	Ninespine stickleback	0.00	N/A	N/A	0.00	9.04	Yes

Lake ID	Latitude (N) (N/AD83)	Longitude (W) (N/AD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured [a]	Resistant Fish Species Captured [b]	15% of Water Under 7 ft of Ice (MG) *	30% of Water under 5 ft of Ice (MG) *	35% of Water under 5 ft of Ice (MG) *	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?
M0702	70.19699	-151.22931	6.7	119	185.9	None	Ninespine stickleback	N/A	3.93	N/A	2.7489	1.1781	No
M0703	70.18769	-151.20702	6.2	57	72.0	None	Ninespine stickleback	N/A	0.21	N/A	0.147	0.063	No
M0704	70.17143	-151.21788	6.0	276	245.0	None	Ninespine stickleback	N/A	0.56	N/A	0.3948	0.1692	No
M0705	70.16008	-151.16967	<4	167	N/A	None	N/A	N/A	N/A	N/A	0.00	13.04	Yes
M0706	70.14639	-151.21721	6.2	236	303.0	None	Ninespine stickleback	N/A	3.79	N/A	2.6544	1.1376	No
M0707	70.14259	-151.17317	6.4	328	432.8	None	Ninespine stickleback	N/A	5.72	N/A	4.0068	1.7172	No
M0708	70.11917	-151.14527	28.9	323	1138.0	Northern pike, Broad whitefish, Round whitefish, Arctic grayling	Ninespine stickleback	69.98	N/A	N/A	67.521	2.46	No
MM1731	70.09211	-151.15208	21.9	81.9	272.4	Least cisco, Northern pike, Broad whitefish	Ninespine stickleback	15.23	N/A	N/A	12.945	2.28	No
MM1732	70.08182	-151.13422	26.7	109	142.2	Northern pike, Broad whitefish	None	3.7	N/A	N/A	2.6355	1.1295	No

Lake ID	Latitude (N) (N/AD83)	Longitude (W) (N/AD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured [a]	Resistant Fish Species Captured [b]	15% of Water Under 7 ft of Ice (MG) *	30% of Water under 5 ft of Ice (MG) *	35% of Water under 5 ft of Ice (MG) *	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?
M0007	70.22449	-151.98941	9.3	370	576.2	None	Ninespine stickleback	N/A	35.38	N/A	24.77	10.61	No
M0104	70.22102	-152.06759	5.5	514	618.0	None	Ninespine stickleback	N/A	0.32	N/A	0.00	42.30	Yes
M0235	70.23618	-152.18804	7.7	229	327.0	None	None	N/A	N/A	N/A	59.93	5.47	No
M0244	70.29105	-152.00802	6.7	420	235.2	None	None	N/A	N/A	N/A	32.93	14.11	No
M0245	70.25281	-151.58735	12.7	30	59.4	None	Alaska blackfish, Ninespine stickleback	N/A	4.68	N/A	3.99	0.69	No
M0255	70.25027	-151.61012	3.9	67	56.8	None	Ninespine stickleback	N/A	0.00	N/A	0.00	5.27	Yes
M0256	70.24439	-151.60801	9.0	30	48.0	None	Alaska blackfish, Ninespine stickleback	N/A	2.91	N/A	2.19	0.72	No
M0301	70.27511	-152.07456	9.9	365	466.6	None	Ninespine stickleback	N/A	20.69	14.48	6.21	20.69	No
M0302	70.25719	-152.17616	9.4	56	93.9	Least cisco	None	3.27	N/A	N/A	2.29	0.98	No
M0305A	70.28695	-152.19686	8.7	743	665.9	None	Ninespine stickleback	N/A	28.88	N/A	20.21	8.66	No
M0307	70.26838	-152.28894	7.0	227	298.2	None	Ninespine stickleback	N/A	3.32	N/A	2.32	0.99	No

Lake ID	Latitude (N) (N/AD83)	Longitude (W) (N/AD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured [a]	Resistant Fish Species Captured [b]	15% of Water Under 7 ft of Ice (MG) *	30% of Water under 5 ft of Ice (MG) *	35% of Water under 5 ft of Ice (MG) *	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?
M0701	70.34077	-152.16568	11.9	839	1152.9	Least cisco	Ninespine stickleback	7.39	N/A	N/A	5.18	2.22	No
M1201	70.29292	-152.04280	7.2	452	483.5	None	Ninespine stickleback	N/A	5.03	N/A	3.52	1.51	No
M1203	70.31484	-152.13875	9.0	218	328.2	None	Ninespine stickleback	N/A	16.49	N/A	11.54	4.95	No
M9901	70.23006	-151.81838	17.6	68	150.8	Arctic grayling	None	4.60	N/A	N/A	3.22	1.38	No
M9903	70.23982	-151.75726	18.8	71	134.0	None	Ninespine stickleback	N/A	9.88	N/A	6.92	2.96	No
M9906	70.23920	-151.85524	9.7	203	369.4	None	Potential	N/A	28.68	N/A	24.38	4.30	No
M9907	70.24069	-151.88001	9.5	148	235.2	None	Ninespine stickleback	N/A	16.50	N/A	12.19	4.31	No
M9912	70.25178	-151.55677	9.6	35	61.9	None	Alaska blackfish, Ninespine stickleback	N/A	3.37	N/A	2.93	0.44	No
M9913	70.25157	-151.54264	7.9	20	29.8	None	Potential	N/A	1.25	N/A	0.88	0.38	No
M9925	70.24747	-151.48285	3.9	212	95.3	None	Ninespine stickleback	N/A	0.00	N/A	0.00	19.06	Yes
MM1702	70.22530	-152.29977	7.4	89	113.1	None	None	N/A	N/A	N/A	15.84	6.79	No

Lake ID	Latitude (N) (N/AD83)	Longitude (W) (N/AD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured [a]	Resistant Fish Species Captured [b]	15% of Water Under 7 ft of Ice (MG) *	30% of Water under 5 ft of Ice (MG) *	35% of Water under 5 ft of Ice (MG) *	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?
MM1704	70.25945	-152.38413	11.1	316	364.4	None	Ninespine stickleback	N/A	13.26	N/A	9.28	3.98	No
MM1705	70.26069	-152.31546	7.0	205	274.7	None	Ninespine stickleback	N/A	4.15	N/A	2.90	1.24	No
MM1706	70.20343	-152.36022	12.9	171	191.0	None	Ninespine stickleback	N/A	17.28	N/A	12.09	5.18	No
MM1707	70.20431	-152.30801	6.7	657	622.6	Broad Whitefish, Arctic grayling	None	0.00	N/A	N/A	0.00	31.13	Yes
MM1708	70.19194	-152.23439	8.4	162	175.2	None	Alaska blackfish	N/A	3.61	N/A	2.53	1.08	No
MM1710	70.17117	-152.25340	10.0	136	308.1	None	Ninespine stickleback	N/A	31.17	N/A	26.38	4.79	No
MM1711	70.16356	-152.27127	10.4	122	241.7	None	Ninespine stickleback	N/A	20.43	N/A	14.30	6.13	No
MM1712	70.16227	-152.29868	10.8	197	324.0	None	Ninespine stickleback	N/A	17.67	N/A	12.37	5.30	No
MM1715	70.22447	-152.35725	11.7	150	269.6	None	Ninespine stickleback, Alaska blackfish	N/A	24.29	N/A	17.00	7.29	No
MM1717	70.24665	-152.36389	15.9	47	119.5	None	Ninespine stickleback	N/A	16.98	N/A	13.42	3.56	No

Lake ID	Latitude (N) (N/AD83)	Longitude (W) (N/AD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured [a]	Resistant Fish Species Captured [b]	15% of Water Under 7 ft of Ice (MG) *	30% of Water under 5 ft of Ice (MG) *	35% of Water under 5 ft of Ice (MG) *	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?
MM1718	70.25492	-152.34653	7.8	114	138.2	None	Ninespine stickleback	N/A	2.04	N/A	1.43	0.61	No
N77099	70.19638	-152.27436	6.9	107	121.4	None	None	N/A	N/A	N/A	17.00	7.28	No
N77101A	70.23182	-152.46791	25.1	1329	1546.0	Arctic grayling, Broad whitefish, Least cisco, Lake trout	Ninespine stickleback	36.67	N/A	N/A	25.67	11.00	No
N77101C	70.24185	-152.41704	18.2	483	145.8	Arctic grayling, Broad whitefish, Least cisco, Lake trout	Ninespine stickleback	22.03	N/A	N/A	15.42	22.03	No

Table 2.8 Key: * Allowable Volume per BMP B-2; MG = million gallons; -- not applicableNotes:**

a. AG= Arctic grayling, BW= broad whitefish, LC=least cisco NS= ninespine stickleback

2.1.4 Drilling Operations Support

Support facilities at each drilling/testing location would include a satellite office camp, storage areas (e.g., fuel storage, drilling waste storage), and maintenance buildings. A remote camp (XBC Camp-Canning Camp) would be placed on an ice pad at a location near Lake M0235, (Figure 1) to facilitate the construction activities of the snow road and ice pad, and provide support during drilling operations. The XBC Ice pad would be approximately 500 feet × 500 feet. There would be up to nine well ice pads and each one would be approximately 800 feet × 800 feet. The communication ice pad (Communication Tower #1) would be approximately 200 feet x 200 feet.

Camps would have the capability to accommodate up to a total of 370 people. The Canning Camp at the XBC Camp Location can house 30 people; the Doyon 141 Rig Camp can house 100 people and four Stallion Camps that can house up to about 60 people each. Equipment that may used at each of the Stallion Camps is shown in Table 2.12.

Table 2.12 Stallion Rig Camp Equipment

Equipment
2,500 potable water tanks in heater skidded module (2)
6,000 gallon diked Diesel Fuel Tanks
12,000 Gallon Waste Water Truck
Smoke Shack
Dumpster
Back-up Generator
Move Equipment: Tractor-Trailer
Move Equipment: Bed Truck with Trailer
Move Equipment: 966 Loader
Move Equipment: Sow for Camp Move

Two communication towers would be needed to support the exploration program. Communication tower 1 is approximately 80-feet high and will be placed on a 200-feet by 200-feet (or acreage equivalent) ice pad adjacent to the Stony Hill access ice road (Figure 1). Communication tower 2 is approximately 120 feet high and would placed on the XBC ice pad. The towers would be anchored with guy wires attached to concrete blocks that are on the ice pads and used as Deadman anchors. The Deadman anchors weigh 11,000 pounds and are 3.6

feet by 6 feet by 6 feet. Bird diverters would be used on guy wires. All communication towers are temporary and would be removed at demobilization.

2.1.5 Drilling and Well Testing

CPAI proposes to drill up to five new wells during the 2017-2018 season and reenter one well. Table 2.13 has a list of equipment that may be used for the drilling operations. The Stony Hill 1 well would be drilled using the Doyon Arctic Fox Rig. All the other wells drilled this season would be drilled using the Doyon 141 drill rig. The well bore design would be similar to previous North Slope exploration wells. The wells are authorized under Drilling Permits issued by the Alaska Oil and Gas Conservation Commission (AOGCC) and BLM Application Permit to Drill. Due to the exploratory nature of the wells and federal regulations; nearly all down-hole information is confidential. No reserve pits would be constructed.

Table 2.13 Drilling Equipment List

Equipment	Quantity	Equipment	Quantity
Pump houses for water extraction from lakes	2 – 4	Welding Trucks	1 – 2
Greywater/Blackwater trucks servicing camps	1 - 2	Cranes	1 - 2
Conductor Drilling Rig	1	Pick-ups/vans	10 – 15
Cementing Pumping Unit	1	Bed Trucks	2 – 4
Drilling Rig – Doyon 141	1	Supersuckers	1 – 2
Drilling Rig – Arctic Fox	1	Mud lab	1
300 bbl. Vac trucks	2 – 4	E-line logging unit	1
Sows or large trucks for moving the rig modules	2 – 3	Winch Trucks	1 – 2
Cementing pumping unit with product silos	1	IWD/MWD shack	1
Hot oil displacement/pumping unit	1	Mobile light towers	4 – 8
Mudlogging shack – shown on the as-built	1	Mobile Heaters	4 - 8
Cats for assisting with rig moves	1 – 2	Fuel Trucks	1 -2
325 bbl. Water trucks	2 – 4	Backhoes/excavators	1 – 2

The Tinmiaq 6 Well would be used for testing only and no rig would be used at the site. Table 2.14 has a list of equipment that may be used during the well testing activity. The P&A wells would use a Coil Tubing Unit (CTU) to complete the P&A work.

Table 2.14 Well Testing Equipment

Equipment	Equipment	Equipment
Expro Flow back unit	400 bbl upright tanks (4)	570 bbl tanks (7)

Equipment	Equipment	Equipment
100 bbl Sand (Relief) Tank	Genset/Air Compressor	Lab
Choke House	Glycol Boiler	Hose Connex
Sand separator	Vertical Gas Scrubber	Tool House
Mobile Light Plants (4-6)	25 KW Generators (2-3)	Fuel Trucks (1-2)
Mobile Heaters (8-10)	90 Foot Flare Stack	Trucks to transport crude (3-5)
Pick-up Trucks (8-15)	Crane	Slickline Unit
Coil Tubing Unit	Nitrogen pumping unit	E-line logging unit
300 bbl vac trucks (1-2)	Well house	N/A

Well evaluation through hydro-fracture stimulation and testing may be performed at any of the locations after completion of well drilling operations. Equipment that may be used during this process is listed in Table 2.15. The current plan is to retain each location for future testing, except for Stony Hill 1 well, which would be P&A'd after drilling and testing. unless the well is not a success then it would be plugged and abandoned.

Table 2.15 Frac Equipment

Equipment	Equipment	Equipment
Treatment Control Vehicle	Tractors (12)	Growler/Blender
Hardline "Missle"	ADP/Blender	Frack Pumps (6)
Hardline trailer	Sand Castle	Chemical trailer
Ball-drop trailer	Crane	Compressor Connex
Chemical Van/trailer	Generators (3)	Heaters (12)
Tiger-style Tank	Light Plants (4)	
400 bbl Pop-off Tank	225 bbl Open-top tank	LRs Down-hole Pump
Treesaver w/power-pack	Transport box	Parts Box
LRS Down-hole Pump	Loader	290 bbl vac truck
90 bbl Fuel Truck	Pick up Trucks (~6)	N/A

Production tests at each well would be performed as needed after production casing is set/cemented and the well completed. Following completion, the well will be hydro-fractured to enhance productivity. Testing may include extended flow periods to determine the productivity of the well. Produced fluids would pass through an adequately sized separator system to prevent oil carryover into the gas stream. Oil from testing would be held in tanks (within ice berms) until the testing is completed. After testing, the oil would either be injected back into the

formation from which it was produced or hauled to Alpine or Kuparuk and processed through their facilities. Produced gas will beflared.

2.1.6 Fuel

Fuel storage capacity totaling approximately 273,800 gallons is expected to be required to support the NPR-A program. Fuel would be stored in multiple fuel containers and placed in lined, bermed fuel storage areas. All fueling and transfer operations would be performed in accordance with the Fieldwide Standard Operation Procedure (Kuparuk and Alpine) for Fluid Transfers (CPAl-005) and liners would be used as required by the Fieldwide Standard Operating Procedures for Liners and Drip Pan Use (F-006). The expected fuel storage in support of the proposed project is provided in Table 2.16.

Table 2.16 Fuel Storage Quantities

Location	Number of Gasoline Tanks	Number of Diesel Fuel Tanks	Quantity Per Tank (Gallons)	Total Amount (Gallons0
XBC Ice Pad	1	2	24,000 Diesel 9.800 Gasoline	57,800
Well Sites (6)	0	1	24,000	144,000
Potential P&A Sites (3)	0	1	24,000	72,000
Totals	0	4	24,000	273,800

Each drilling contractor holds a Spill Prevention Control and Countermeasure Plan (SPCC) for its fuel storage facilities associated with their drilling operations. The well testing companies hold SPCC plans for their testing tanks. Additionally, CPAI has a SPCC plan for exploration activities. A spill technician with Alaska Clean Seas and a Field Environmental Coordinator would be on site during drilling and on site at the XBC location

2.1.6.1 Fuel Transfer, BMP A-5 Deviation Request

CPAI proposes to refuel light plants and pump houses on lakes and some of the well locations are within 500 ft of standing water. CPAI has requested a deviation from BMP A-5 which states:

A-5 Best Management Practice
Objective: Minimize the impact of contaminants from refueling operations on fish, wildlife and the environment.
Requirement/Standard: Refueling of equipment within 500 feet of the active floodplain of any water body is prohibited. Fuel storage stations shall be located at least 500 feet from any water body with the exception that small caches (up to 210 gallons) for motor boats, float planes, ski

planes, and small equipment, e.g. portable generators and water pumps, are permitted. The authorized officer may allow storage and operations at areas closer than the stated distances if properly designed to account for local hydrologic conditions.

CPAI's justification:
CPAI proposes to refuel light plants and pump houses on water source lakes. Moving light plants off of lakes for refueling is impractical as light plants would require an additional vehicle to move them every 12 hours for refueling. Moving pump houses off lakes for refueling is not practical or safe as they are self-contained modules which are heavy and would have to be moved using a winch truck and a flatbed truck. These are also fueled every 12-hour shift. CPAI uses secondary containment during all fueling operations and the pump house fuel tank is also contained inside the pump house. CPAI has rigorous fuel transfer protocol and procedures.

2.1.7 Waste Management

Wastes would be handled according to the comprehensive waste management plan required by the BLM under NPR-A IAP/EIS BMP A-2, as summarized below.

Water-based drilling muds would be used, which include additives used to maintain desired drilling fluid properties and density. Excess drilling mud would be transported to an approved Class II injection well at Kuparuk, or through the grind and inject facility at Prudhoe Bay. Prior to hauling away for disposal, the cuttings and liquids would be temporarily stored in cutting boxes inside ice-bermed drilling waste storage cells or tanks at the drill sites.
During drilling, CPAI anticipates having up to six leakproof cutting bins at each drilling well location. Each of the cutting bins would be within an ice cell as secondary containment. The ice-bermed waste storage cells would be permitted by the ADEC Solid Waste department. It is anticipated that up to 20,000 cubic feet of cuttings could be generated at each drill site from the drilling wells. The cell dimensions would be as large as 100 feet x 150 feet x 3 feet, giving a gross volume of 45,000 cubic feet. The thickness underneath the temporary drilling waste storage areas would be approximately 2 feet. Since there is a State requirement for 2 feet of freeboard, the usable storage volume is one third of gross volume (20,000 cubic feet for each storage cell). The storage cells may be constructed with smaller dimensions and higher berms, as long as there is 2 feet of freeboard above the cuttings. The volume of wastes placed in each storage cell would be minimized as would snow accumulation in the cell.

Upon completion of activities at the well sites, the ice-bermed drilling waste storage cells would be broken up and cleaned of contamination. Material cleaned from these cells would be hauled to, Prudhoe Bay or Kuparuk for disposal at an approved Class II injection well. An average of 20,000 gallons per day (gpd) of waste liquid from the well may require disposal, although all efforts to minimize this amount will be undertaken.

Solid, non-burnable waste would be deposited in large dumpsters or other suitable containers located at each site. These containers would be back-hauled to the NSB landfill at Prudhoe Bay. The food waste that could attract wildlife would be stored in secured wildlife proof container while waiting for pickup.

Camp wastewater would be hauled primarily to the Kuparuk Operations Center Waste Water Treatment Facility or alternatively the wastewater treatment facility at Alpine may be used. Wastewater would not be directly discharged by the camps. All treatment systems used will meet the ADEC requirements. Each rig camp could generate about 6,500 gpd of domestic wastewater.

2.1.8 Air Emissions

Sources of air emissions from the operation are rig engines, camp generator engines, steam generators, mobile non-road engine and construction equipment, used oil burners, hot-air heaters, light plants, incinerators, and potentially well test flaring equipment. CPAI has applied for ADEC authorization for the NPR-A exploration locations under Minor General Permit #1 for Oil and Gas Drilling Rigs. BMP A-9 requires the use of Ultra-low sulfur diesel and evaluation of the potential for hydrogen sulfide (H_2S) release indicates that significant quantities are not expected at any drilling location. Measures and precautions associated with hydrogen sulfide are addressed in the Application for Permit to Drill filed with the BLM.

2.1.9 Contingency Plans

Contingency plans are described below.

2.1.9.1 Wildlife Protection and Encounter Plans

CPAI has a Polar Bear Avoidance and Interaction Plan and a Wildlife Interaction Plan that they have updated over the years, with input from the United States Fish and Wildlife Service's (USFWS) Marine Mammal Management Office. The latest version is from 2015. An approved orientation program is required for all personnel working in the NPR-A, which includes a segment on polar bear avoidance and interaction. These actions, along with the required Subsistence Plan, provide wildlife protection measures.

2.1.9.2 Oil Discharge Prevention and Contingency Plan (ODPCP)

The Applicant is required to have approved oil spill response measures in place to meet Federal and State requirements. CPAI must have a site-specific ODPCP approved by ADEC that is considered sufficient to meet BLM requirements.[1] CPAI is requesting a minor amendment to the "North Slope Exploration ODPCP" for the NPR-A exploration locations.

The ODPCP contains information on immediate response actions, receiving environments, spill cleanup, mobilization response times, and well control. The ODPCP encompasses standard response methodology and resources for the response. Additionally, the BLM inspects the wells and pads during construction and drilling. The Applicant's approved ODPCP, along with approved spill control equipment and supplies will be kept on site. Phone service will be available 24-hours a day at the drilling camp.

[1] CPAI ODPCP is available for review at ADEC.

No drilling will begin until the well pad is fully constructed and accessible by packed snow trail or ice road; the period of active drilling is subject to seasonal restrictions set in the ODPCP approval. In accordance with the ODPCP condition of approval, CPAI will cease drilling in hydrocarbon-bearing formations and isolate said zone by April 24th, to ensure the effectiveness of planned spill response methods prior to the onset of spring breakup.

The ODPCP contains CPAIs blowout prevention details and their plans to deal with a blowout in the unlikely event that one occurs.

2.1.9.3 Spill Prevention and Countermeasure Plan (SPCC)

An SPCC Plan provides guidelines for pollution prevention and addresses secondary containment where fuel and hazardous materials are stored in quantities of 1,320 gallons or more. The drilling contractor holds an SPCC plan for its fuel storage facilities associated with their drilling operations and the well testing company holds an SPCC plan for their testing tanks. Additionally, CPAI has a SPCC plan for exploration activities.

2.1.9.4 Waste Management Plan

The applicant is required by the 2013 NPR-A IAP/EIS ROD BMP A-2 to submit to the AO for approval a Waste Management Plan for all phases of exploration and development. CPAI's plan is summaries in Section 2.17 Waste management above.

2.1.9.5 Hazardous Materials Emergency Contingency Plan

The applicant is required by the 2013 NPR-A IAP/EIS ROD BMP A-3 to have a Hazardous Materials Emergency Contingency Plan. Conoco's North Slope Exploration ODPCP contains procedures for immediate spill notification, response, and cleanup in the event of, or threat of, a hazardous substance spill and includes spill reporting information (see ODPCP, Part 1 - Response Action Plan). This information is applicable to all hazardous substance spills (e.g. not only a worst-case discharge). In addition, the ODPCP incorporates two response Strategies addressing a diesel tanker spill (see ODPCP, Part 1, scenarios in Section 1.6.5).

The ODPCP addresses appropriate procedures for fuel/hazardous substance handling/transfer and also references the ***North Slope Environmental Field Handbook*** and the ***Alaska Safety Handbook.*** Combined, these documents describe the proper procedures employees and contractors must use for handling fuel/hazardous substances (see ODPCP, Part 2, Section 2.1.5).

2.1.9.6 Weed Control Plan

CPAI would wash (either by steam or high pressure water) any vehicle that drives on the Dalton Highway (also known as the haul road) and delivers goods and materials to locations in the NPR-A via ice road. Washing would be completed once each year between 1 October and 31 December. The truck, trailer number, and the date they were washed would be documented. Any equipment that is permanently based or dedicated to the North Slope and does not travel the haul road is washed as part of standard operating procedures and scheduled maintenances.

CPAI would communicate with all contractors and work with them to ensure that all vehicles that may travel by ice road into the NPR-A have been washed prior to entering the NPR-A for the upcoming winter exploration season 2017-2018.

2.1.9.7 Orientation Plan

CPAI requires all North Slope employees and contractors to complete an 8-hour unescorted training program provided by the North Slope Training Cooperative (NSTC). All trainees receive a Field Environmental Handbook, an Alaska Safety Handbook, and a North Slope Visitor's Guide. The unescorted training includes review of the Alaska Safety Handbook, and sections on personal protective equipment, camps and safety orientation, hazard communication, HAZWOPER Level 1, and Environmental Excellence. The NSTC also provides specialized training in hydrogen sulfide, hearing conservation, electrical safety, respiratory protection, energy isolation, confined space entry, asbestos awareness, fall protection, toxic substance control, benzene, NORM, formaldehyde, and first aid/CPR.

Site specific training, such as CPAI's BLM-approved NPR-A orientation program, would be conducted as required. The program is required for all personnel who would be working in the NPR-A. Personnel receiving NPR-A training would be provided with additional information regarding CPAI's proposed winter operations. The NPR-A training module teaches awareness of the environmental, social, and cultural concerns that relate to NPR-A. Topics included in the training are: the importance of not disturbing archeological and biological resources and habitats; guidance on how to avoid disturbing of the aforementioned; and avoidance of conflicts with subsistence hunting and fishing activities, and pertinent mitigation. All involved personnel are required to attend the class once per year. CPAI and its contractors are required to maintain records of all personnel who attend the program for as long as the site is active, but not to exceed the 5 most recent years of operations.

2.1.9.8 Other plans

The North Slope operating fields have an Incident Management Team (IMT) which follows the Incident Command System. The IMT is on call 24-hours per day. Personnel involved in an emergency situation would notify Alpine Security who would direct the IMT to respond. An Environmental Health and Safety Policies and Procedures manual is available on CPAI's intranet web page and Emergency Response Plans are available at the individual facilities.

2.1.9 Abandonment and Restoration

Upon completion of drilling and evaluation operations, all debris would be hauled to an approved disposal site outside of the NPR-A. The ice pads would be chipped or scraped to pick up any spills and the scrapings would be hauled to an approved disposal well. The exploration wells would be suspended for future evaluation, except for Stony Hill 1 which would be P&A'd prior to demobilization from the site. As previously mentioned. CPAI may take the opportunity to P&A three other wells in the BTU. Any well abandonment or suspension plans would be in accordance with applicable BLM and Alaska Oil and Gas Conservation Commission (AOGCC) regulations, and would be approved prior to enactment. Final site closure would be approved by the appropriate regulatory agencies.

After the ice road and ice pads melt in the summer, CPAI would perform an inspection of each location to pick up any remaining debris and to look for potential tundra damage. Prior to this activity CPAI would file a plan of operations for approval from the BLM.

2.1.10 Community Relations

Local Hire CPAI states that they are committed to continuing their partnership with local contractors and businesses through competitive bid contracting opportunities. When reasonably foreseeable to do so, CPAI has committed to hire and, where appropriate, to provide training to Kuukpik shareholders, Nuiqsut residents, and Alaska Natives. When appropriate, local resident hire would continue to be coordinated through the Kuukpik employment coordinator to identify and place qualified individuals interested in working on the project. In addition, CPAI and its contractors assist with scholarships, career training, and internship opportunities to further expand local workforce capabilities and ensure that local residents are hired and retained as CPAl's employment requirements increase.

In previous years CPAI has participated in job fairs held in the village of Nuiqsut. The job fairs are an opportunity for CPAI to inform Nuiqsut and other North Slope residents about jobs available with CPAI's winter activities on the North Slope. Attendees can gather information on the specific jobs available with CPAI and its contractors, the time period the jobs would be available, and the pay scales. The job fair is an excellent opportunity for local residents to become familiar with the planned winter operations and to talk with the people who will be hiring residents.

Subsistence. The project area is recognized as a subsistence use area for Nuiqsut and Utqiagvik. Public meetings and consultations included subsistence discussions. The Applicant plans to continue consultation with subsistence users and implement mitigation measures, as necessary. CPAI has prepared a Subsistence Plan to satisfy a requirement of the 2013 NPR-A IAP/EIS ROD BMP H-1. The document would assist in the identification of potential issues and response actions. Prior to issuing development permits, the NSB solicits public review including State and Federal agencies, local officials, residents, and private property owners in the affected area.