

Chapter 2

2 Proposed Action and Alternatives

Caelus Energy Alaska Smith Bay, LLC (CEASB) is proposing to cross lands managed by the BLM to reach their State of Alaska offshore oil and gas lease (Tulimaniq drill sites CT-1 and CT-2) and drill up to two oil and gas wells during the winter of 2015-2016. The exploratory well sites are located in southern Smith Bay near the Ikpikpuk River Delta, as shown on Figure 1. The proposed camp for the program would be located at Lake M0654. Mobilization of equipment and materials would occur by snow roads on both federal and state lands during winter tundra operating conditions.

In 2014-2015, NordAq Energy, Inc. (NordAq) began a similar exploration project to what CEASB proposes for 2015-2016; however, NordAq was unable to execute drilling activities in Smith Bay as planned.

2.1 Alternative A - Description of the Proposed Action

NordAq previously conducted several archaeological studies to support their winter activities. CEASB has reviewed the cultural resources field report and coordinated with the archaeologist, Dr. Rick Reanier, to verify that there are no sites in the vicinity of the proposed snow road routes, ice infrastructure, authorized water sources or otherwise. Field verification occurred primarily by aerial helicopter survey this past summer.

CEASB has proposed the following schedule, shown as Table 2.1, for the 2015-2016 drilling season. All dates are approximate and may be altered by weather or other logistics requirements.

Table 2.1 Estimated Schedule

Activity	Estimated Start Date	Estimated End Date
Start Operations at Pt. Lonely	October 20, 2015 ¹	June 1, 2016
Begin Prepacking Snow Trail, Pt. Lonely to Smith Bay	October 20, 2015 ²	October 30, 2015
Overland Mobilization to Lake 654	Late December	Middle January
Begin Prepacking Trail from DS-2P	November, 2015 ³	January 15, 2016 ⁴
Construct Ice Pad at Lake 654	December 19, 2015	

¹ Upon receipt of BLM ROW

² Dependent on BLM approval of prepacking activities.

³ Upon receipt of BLM ROW

⁴ Dependent on Start date, estimated up to 76 days of prepacking

Pre-Season Infield Ice Construction and Prepack Operations	When conditions allow	
Construct Ice Runway Lake 654	December 19, 2015	
Construct Secondary Containment	January 5, 2016	
Ice Island Construction (2 sites)	December 29, 2015	February 18, 2016
Begin Drilling and Well Testing (2 sites)	February 2, 2016	March 29, 2016
Demobilization and clean up	March 29, 2016	May 11, 2016

2.1.1 Access

CEASB has proposed a route from Point Lonely to Lake M0654, a route from ConocoPhillips Alaska Inc. Drill Site 2P (DS-2P) location and two alternate routes (See Figure 1).

2.1.1.1 Access Via Point Lonely

CEASB has a BLM authorization to allow the staging of equipment (Figure 2) at Pt. Lonely beginning in August, 2015. CEASB barged equipment to the site for use in this project. The material staged included spud-critical materials and equipment for mobilization by snow road from Point Lonely to CEASB's primary operating area near Lake M0654, south of Smith Bay.

CEASB has requested an authorization from BLM to conduct prepacking of snow on a route from Point Lonely to Lake M0654 to expedite the use of the trail once conditions are such that travel would not damage the tundra. BLM is currently reviewing the prepacking activity and if authorized would issue an NPR-A permit. This route would have a higher level of traffic to and from Lake M0654 operational area than the preferred overland route (See 2.1.1.2) as the majority of the materials and equipment to support drilling activities would originate from Point Lonely.

Ice infrastructure equipment that is currently stored at Point Lonely would be mobilized infield when CEASB can begin using the Point Lonely overland snow route to Lake M0654, beginning in early December or as soon as conditions allow for the start of ice infrastructure construction. Camp facilities would be mobilized in late December to early January before the rest of the spud-critical equipment and materials that are onsite are mobilized, which is anticipated to continue until January 31, 2016.

If the temporary ice air strip at Lake M0654 (Section 2.1.2 and figure 3) is unusable due to adverse weather conditions or for some other reason, the gravel airstrip at Point Lonely might be used for occasional aircraft landings; however, CEASB does not propose to utilize Point Lonely as its primary airstrip during any phase of the winter activities.

CEASB has requested authorization to continue utilizing the gravel facilities at Point Lonely through June 1, 2016, in the event that demobilization must occur partially by marine barge during the subsequent open water season. Survival camps and emergency fuel storage in secondary containment would be maintained at the Point Lonely facilities throughout the winter activities. Although CEASB proposes to demobilize via the DS-2P snow road route, weather conditions or other delays may preclude the option of full overland demobilization, in which case CEASB would request approval from BLM to continue using Point Lonely for storage/staging until all equipment could be transported by marine barge during the subsequent open water season to West Dock. If storage were to be needed past June 1, 2016, BLM would require CEASB to obtain a summer NPR-A permit.

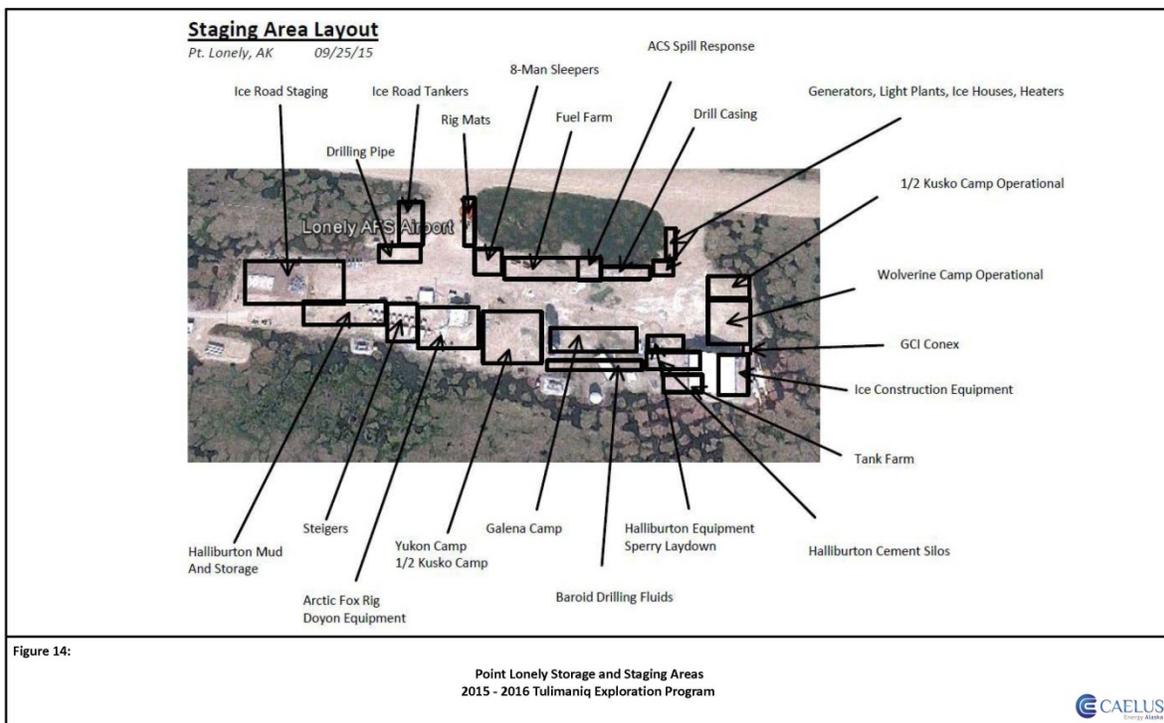


Figure 2. Pt. Lonely Pad Overview

2.1.1.2 Preferred Overland Travel Route Access

CEASB would utilize the DS-2P route (Figure 1) for transporting materials and equipment that could not be transported to Point Lonely by marine barge during the open water season to the Lake M0654 operational area and drill site(s). The DS-2P route would also be used to demobilize equipment that is no longer being used and to transport waste from the drill sites and Lake M0654 to permitted disposal facilities. Traffic would be limited to Steigers and Tundra Bears. The number of trips would vary during the different phases of winter activities but is projected to mimic the schedule shown in Table 2.2:

Table 2.2 Snow Road Trips

Start	End	# Steigers	Days/Trip	Trips/Week/Steiger	Total Trips/Week
1/15/2016	2/1/2016	10	3	2	23
2/1/2016	3/29/2016	8	3	2	19
3/29/2016	4/17/2016	20	3	3	56

2.1.1.3 Alternative Routes

CEASB has not proposed specific activities along the alternate routes at this time. They identified feasible alternate routes for contingency planning purposes and have requested BLM's preliminary approval of the proposed routes so that in the event that the DS-2P route was no longer feasible, CEASB has a viable alternative, subject to further coordination at the time that the change was proposed/requested.

2.1.1.4 Pre-Packing

As noted in Section 2.1.1.1, BLM has approved the prepacking of snow on the Point Lonely to Lake M0654 route. CEASB proposes also to prepack along the preferred overland travel route and alternate routes if the need arises. This prepacking would not occur until after such time that BLM approves the proposed action and grants a ROW to CEASB for winter access.

CEASB provided a description of pre-packing. Pre-packing is compacting snow while driving low-impact vehicles along a surveyed route, before the natural snow and ice conditions reach the threshold that the company determines sufficient to start winter tundra travel. While the State of Alaska opens tundra on State managed lands in the winter, BLM leaves it to the company to decide when the conditions are such that they would not disturb the tundra. If the company does disturb the tundra they could be issued a notice of noncompliance and required to remediate the damage.

CEASB states that pre-packing is recognized by the Alaska Department of Natural Resources (DNR) as a Best Management Practice to protect the tundra and is typically allowed to begin when adequate snow cover is present, irrespective of ground temperature. Caelus would use DNR summer tundra-certified PistenBullys and Tucker Sno-Cat vehicles for pre-packing. These vehicles were also used by NordAq Exploration for activity in the NPR-A last winter, as approved by BLM.

2.1.1.5 Aircraft

CEASB submitted several plans to fulfill the requirements of BMP F-1c, to include Air Operations and Emergency Response Plan 2015-2016 Tulimaniq Exploration Program, Cruz

Construction Emergency Response Program and Lyden Air Cargo Emergency Procedures Manual.

CEASB proposes to conduct regular flight operations in support of the 2015-2016 Tulimaniq Exploration Program using a temporary ice airstrip at Lake M0654 (Figure 4). CEASB proposes to begin construction of the ice airstrip on December 19, 2015. Initially constructed to be 150 ft wide and 3000 feet (ft) long, the ice airstrip will be extended to 5000 ft within 10 days of initial construction to enable use by virtually any aircraft. The total length will include a turnaround (See Figure 5) area at the northeastern end of the runway, measuring 350 ft wide and 450 ft long. Staging of aircraft for unloading and/or fuel transfer would primarily occur in the turnaround area. Ground traffic would access the ice airstrip via an ice road spur from the shore camp ice pad located east of Lake M0654. All normal flight operations would be conducted using fixed wing aircraft; no helicopter activity is proposed. The estimated peak average is 24 flights per week (flights/week), which is reflected in the table below:

Primary Provider	Purpose	Aircraft	Frequency (flights/week)
Alaska Air Fuel	Fuel Provider	Douglas DC-4	14
Ravn Alaska	Crew Change	DeHavilland DHC-8 Dash 8	3
Bald Mountain	Resupply	Dehavilland DHC-6 Twin Otter	7
Back-up Provider	Purpose	Aircraft	Frequency (flights/week)
Cruz Construction	Site Inspection	Beechcraft King Air	As Needed
70 North	Various	Cessna 207	As Needed
Lynden	Various	C-130 Herclues	As Needed
Iliamna Air Services	Various	Pilatus PC-12	As Needed

CEASB has minimized the number of flights required to the maximum extent possible given the logistical constraints of operating at a remote location. Most flights will originate out of Fairbanks with some flying out of Anchorage or Deadhorse.

Adverse weather conditions, including temperatures below 40°F, can persist for up to 1-2 weeks and may prevent all normally scheduled flights from occurring. During weeks when no flights have occurred, the total number of flights in the 1-2 weeks immediately following would be approximately double the estimated amount in order to make up for flights missed but would not exceed 50 flights/week. CEASB proposes to coordinate with the BLM to provide notice of anticipated changes in the frequency of flights or use of alternate providers, which are not anticipated to be used on a regular basis.

CEASB would maintain a log of all takeoffs and landings that will be provided to BLM as record of all flight operations. Each carrier's pilots have been or would be briefed on best management practices regarding aircraft altitude and landings while operating in the NPR-A. Pilots would also be advised to avoid flying over areas such as Teshekpuk Lake in order to avoid disturbance to wildlife and/or subsistence users in the area.

Because of the high elevation at which the aircraft would be traveling, CEASB does not anticipate any impacts to local subsistence users. CEASB did not receive any comments or concerns regarding proposed air operations during the community meetings that staff conducted in Barrow, Nuiqsut, or Atqasuk. Nor have any of the Native allotment or cabin owners who were notified by letter with the assistance of the Native Village of Barrow Realty Group expressed concerns regarding the frequency of aircraft landings. CEASB would continue to coordinate with local stakeholders and resource agency representatives regarding proposed air operations and other winter activities.

2.1.1.6 Mobilization

Winter mobilization of materials and equipment not initially transported by marine barge would be via an overland snow road with an origin at an ice pad near the Kuparuk River Unit (KRU) DS-2P Pad (See Figure 1). Alternate near shore sea-ice and overland routes have been identified for contingency planning purposes, all originating at Oliktok Point. CEASB would determine its winter mobilization route based on environmental and weather conditions; however, the terminus of all the winter season mobilization route options would be at the Lake M0654 location. See Figure 1 for mobilization route options and Tulimaniq lease boundaries.

In August 2015, CEASB installed five new thermistors and conducted maintenance on five thermistors that were previously deployed by NordAq in critical overland travel areas. The thermistors (See Figure 1) are designed to transmit data, including real-time soil temperature at depth, via satellite to a website that would be available to agencies, landowners, and contractors. CEASB would use the thermistors to provide information for determining when tundra conditions are such that tundra damage is not likely to occur during travel. In addition to those along the snow road route, thermistors were also installed at the Point Lonely staging area, shore camp area adjacent to Lake M0654, and proposed location of the ice pad near DS-2P, which is not on lands managed by the BLM and within the Kuparuk River Unit.

Public access to packed snow trails would be allowed with no control points planned. A safety exclusion zone would be identified using signs at and approaching the Tulimaniq drillsites, warning the public of the work in progress. Table 2.3 outlines the proposed equipment for the drilling operation and support facilities.

Table 2.3: Equipment List for ice pad, ice road, camp, and snow trail

All-Terrain Vehicles	Quantity
Steiger or T-Bear ATV Haul Unit	1
Pisten Bully 400 ATV Unit	4
All Terrain Water Buffalo Truck (120 bbl)	6
Foremost Delta 3 Fuel Tank (2500 gal)	1
Tucker Snow-Cats	4

Snow Bird - Drill / Flood Pump	3
Camp Units	Quantity
Pre-Pack Survival Camp	2
8 Person Camp Wet Sleeper	4
10 Person Camp - Copper River	1
20-Person Camp - Wolverine Camp	1
36-Person Camp - Galena Camp	1
52-Person Camp - Yukon Camp	1
64-Person Camp - Kuskokwim Camp	1
Kitchen / Dining Room Modules	2
Mobile Shops	1
Office Units/Modules	2
Camp/Rig Support Equipment	Quantity
Wastewater Processing Module (1,000-2,500 gal)	4
Potable Water Processing Module (5,200 gal)	3
Settling Tanks - Wastewater Treatment Plant	4
Potable Water Holding Tanks	2
Wastewater Holding Tanks	2
Generators (40-300 kW)	8
Bull Rail Heavy Duty	4
Cranes and Loaders	Quantity
75-80 Ton Cranes	2
Volvo 220 / CAT 980 Loader with Bucket and Forks	2
Volvo 120 Loader with Bucket and Forks	6
CAT 988 Vertical Forklift	2
Trailers – All-Terrain and Highway	Quantity
60 Ton Sub Base Heavy Haul ATV Trailer	1
60 Ton Double Drop Low Boy ATV Trailer	1
60 Ton Scissor Neck All Terrain Lowboy	2
25 Ton Marcep All-Terrain Trailers	1
40 Ton T-Bear Scissor Neck All-Terrain Trailer	5
Heavy Haul ATV Low Boy Trailer	4
Pisten Bully Sleigh Trailer	2
Tuck Sno-Cat Trailer	4
Oilfield Floats	1
Highway Scissorneck Lowboy	2

2.1.2 Shore Camp Lake M0654

A 150 person camp would initially be used at Lake M0654 for ice pad, airstrip, and infield ice road construction (Figure 3) prior to drilling. The camp would be increased to accommodate 195 workers during the drilling season. No camp facilities would be located at their offshore drillsites. This camp would treat lake water for potable use and would have a wastewater

treatment system with discharge of treated water to tundra surface away from the lake. Cruz currently has a waste water permit from the Alaska Department of Environmental Conservation (ADEC) for the Point Lonely location. They would submit a Notice of Intent to operate under the wastewater permit to ADEC with a new location description prior to the camp modules being mobilized to the Lake M0654 shore camp ice pad.

After the rig is hauled to the ice island, the shore camp would remain at the southern end of Smith Bay to provide program logistics support, facilitate crew changes, and support demobilization at the end of the season. A dish antenna would be used to support communications of phone and internet.

An ice airstrip up to 5,000 ft. in length, 200 ft. in width and a depth of 3 ft. is proposed to be constructed (Figure 4) at Lake M0654 with an ice road to the adjacent Lake M0654 ice pad. From there a six mile ice road would connect to the Ct-1 drillsite and a five mile ice road would connect CT-1 to CT-2 for a total distance of 11 miles.

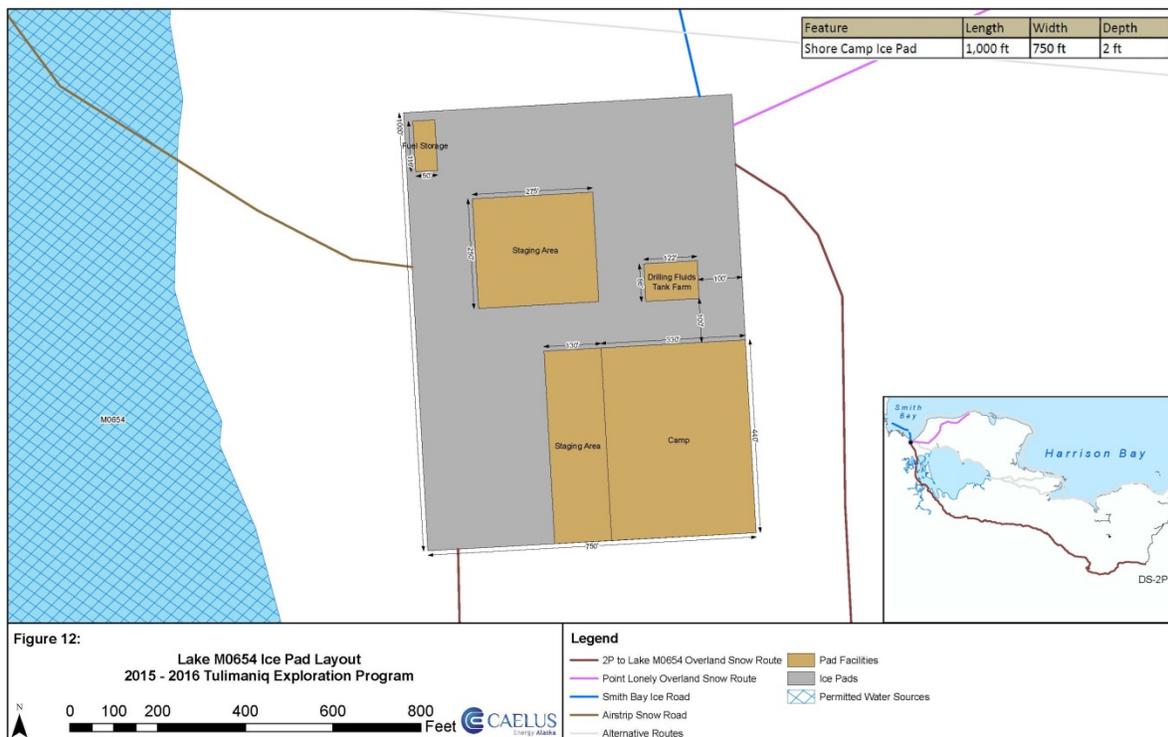


Figure 3 Lake 654 Layout

2.1.3 Water

Fresh water is needed for the ice pads, drill sites and airstrip construction/maintenance, drilling operations, and camp use. Freshwater, seawater, and ice chips would be extracted from permitted water sources (Table 2.4). Ice chips removed from grounded portions of any permitted lake would be included in the total permitted withdrawal volume.

Snow would be removed from portions of lakes approved for water withdrawal, ice chip harvest, or both. Snow removal would provide access for water trucks and ice chippers, installation of temporary water houses, and truck turnaround areas. CEASB acknowledges that snow removal from non-grounded portions of fish-bearing lakes must be approved on an individual basis and would coordinate with the Alaska Department of Fish and Game (ADFG) and BLM as appropriate. The water would be pumped from lakes and transported by low pressure vehicles or rolling stock (Steigers, Tuckers, Water Buffalo ATV trucks, and Tundra Bear ATV trucks). Rolling stock would only use trails that have been improved with a firm ice surface to support the weight and pressure of the vehicles.

Light plants would be located on access roads and on frozen lakes at the water houses for safety purposes. The light plants would be refueled in compliance with federal and state regulations. Light plant fuel supply storage would have 110 percent containment. Signs would be placed at the access points of permitted lakes.

Water would be processed for human use via a permitted drinking water treatment system. Approximately 50 gallons per day of potable water would be used per day per person. The camps would require a season total of approximately 1.4 million gallons of potable water. A season total of approximately 2 million gallons of water would be required to support drilling operations. Ice infrastructure water withdrawal requirements (estimated) is shown in Tables 2.4 and 2.5 below.

Table 2.4 Water and ice Withdrawal Requirements by Source (BLM managed lands only)

Lake ID	Latitude (N) (NAD83)	Longitude (W) (NAD83)	Max Depth (feet)	Surface Area (acres)	Volume (MG)	Sensitive Fish Species Captured ^a	Resistant Fish Species Captured ^b
M0651	70.72595	154.05833	8.0	458.7	596.9	none	NS
M0653	70.74082	154.13029	7.9	1432.3	2701.1	none	NS assumed to be present
M0654	70.74947	154.22931	6.4	1085.7	1615.0	none	none
Lake ID	15% of Water Under 7 ft of Ice (MG) ^c	30% of Water Under 5 ft of Ice (MG) ^c	35% of Total Lake Volume (MG) ^c	Liquid Water Volume Requesting (MG)	Ice Aggregate Volume Requesting (MG)	Requires BLM Deviation per BMP B-2?	--
M0651	--	27.96	--	0.00	5.00	No	--
M0653	--	162.96	--	1.00	0.00	No	--
M0654	--	--	565.250	10.00	42.40	No	--

Table 2.4 Key

MG = million gallons, -- = not estimated or not applicable.

Notes:

- a. AG = Arctic grayling, BW = broad whitefish, HW = humpback whitefish, LC = least cisco, RW = round whitefish
- b. NS = ninespine stickleback, AB = Alaska blackfish

c. Allowable Volume per BMP B-2

Water source locations and access routes are presented in Figure 4. Water withdrawal from an offshore channel adjacent to the Ikpikpuk River delta alluvial plain is planned using water from Smith Bay and Ikpikpuk River discharge. Ice chip withdrawal is planned from shorefast ice within a 2 mile radius of the well bore location(s). Figure 4 indicates the areas within Smith Bay for which Caelus is currently permitted to withdraw water.

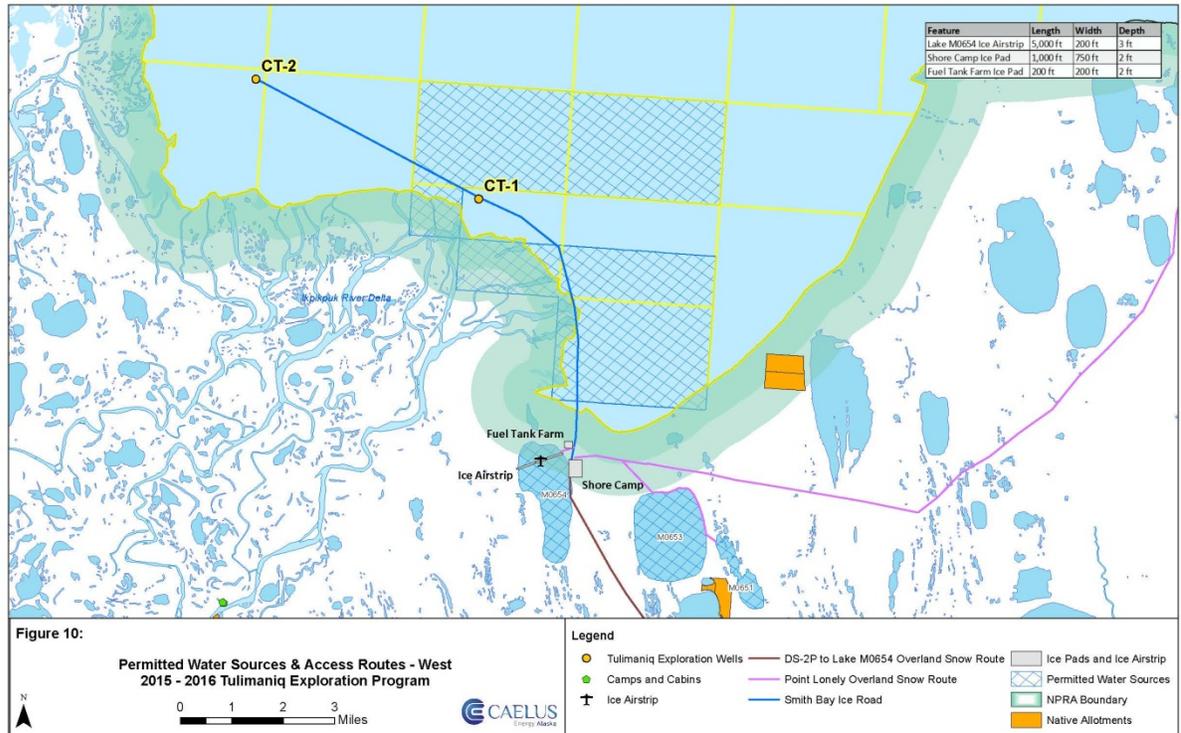


Figure 4: Water Source Locations and Access Routes

Table 2.5 Water and Ice Withdrawal Requirements by use

Feature	Water and/or Ice Aggregate
Ice Roads	47 Million Gallons
Drilling Ice Pads (2)	46.25 Million Gallons
Lake M0654 Ice Airstrip	22.5 Million Gallons
Shore Camp Ice Pad	11.5 Million Gallons
DS-2 Ice Pad	3.75 Million Gallons
Drill Rig Use	2 Million Gallons
Potable Camp Use	1.5 Million Gallons
Total:	134.5 Million Gallons

Table 2.6 Stream crossings identified on BLM lands for 2014-2015 exploration.

No.	Route	Latitude (NAD 83)	Longitude (NAD 83)	Name	Land Manager
1	DS-2P Overland Snow Road	70.068485	-150.572147	DS-2P Crossing 1	State
2	DS-2P Overland Snow Road	70.068349	-150.881300	Itkillik River Crossing	State
3	DS-2P Overland Snow Road	70.018907	-151.033730	DS-2P Crossing 2	State
4	DS-2P Overland Snow Road	70.014460	-151.176021	DS-2P Crossing 3	State
5	DS-2P Overland Snow Road	70.055244	-151.389023	Colville River Crossing	State/BLM
6	DS-2P Overland Snow Road	70.133727	-151.643144	Ublutuoch River East Fork Crossing	BLM
7	DS-2P Overland Snow Road	70.206700	-151.902867	Judy Creek Crossing	BLM
8	DS-2P Overland Snow Road	70.291543	-152.295244	Fish Creek Crossing	BLM
9	DS-2P Overland Snow Road	70.293721	-152.398346	Kalikipik River East Crossing	BLM
10	DS-2P Overland Snow Road	70.296873	-152.408630	Kalikipik River Crossing	BLM
11	DS-2P Overland Snow Road	70.322119	-152.909741	DS-2P Crossing 4	BLM
12	DS-2P Overland Snow Road	70.332430	-153.104436	Lake 122 Creek Crossing	BLM
13	DS-2P Overland Snow Road	70.342941	-153.273154	DS-2P Crossing 5	BLM
14	DS-2P Overland Snow Road	70.348540	-153.502478	Kealok Creek Crossing	BLM
15	DS-2P Overland Snow Road	70.251886	-152.029291	DS-2P Crossing 6	BLM
16	DS-2P Overland Snow Road	70.366461	-153.586277	DS-2P Crossing 7	BLM
17	DS-2P Overland Snow Road	70.639224	-154.119112	DS-2P Crossing 8	BLM
18	Point Lonely Overland Snow Road	70.875082	-153.383242	Point Lonely Crossing 1	BLM
19	Point Lonely Overland Snow Road	70.861526	-153.478201	Point Lonely Crossing 2	BLM
20	Point Lonely Overland Snow Road	70.862790	-153.516818	Point Lonely Crossing 3	BLM

2.1.4 Fuel Supply and Storage

Secondary containment of bermed and impermeable lined fuel storage areas would be used to temporarily store diesel fuel and drilling fluids. The diesel fuel storage containment is designed for arctic conditions and will be capable of holding a minimum 110 percent of the largest fuel storage container. Containment discharge practices are outlined in the Tulimaniq Spill Prevention and Countermeasure Plan (SPCC) Plan.

The four main areas that would store fuel are Point Lonely, the offshore drill sites, Lake M0654 area, and KRU DS-2P ice pad. Up to 147,000-gallons of fuel, in differing tank volume sizes would be stored at Point Lonely to support operations. The drilling rig would have a main tank of 6,500 gallons of diesel and approximately 10,000 gallons of other fuels in various tank volume sizes. The drilling ice pads tank farm would include approximately 19,800 gallons of diesel. An additional volume, up to 118,500 gallons would be staged with a minimum offset of 500 ft. from the Lake M0654 shoreline. There would be up to 23,340 gallons of fuel, in differing tank volume sizes, stored at the DS-2P ice pad to support snow road construction and maintenance. There would also be an emergency shelter and 2,400 gallon diesel fuel tank to fuel equipment along the DS-2P snow road.

Fuel would be transferred daily from the Lake M0654 area tank farm using conventional fuel tanker trucks to the drill ice pads. Fuel resupply to this tank farm would be via aircraft to the Lake M0654 airstrip and then transferred to the tank farm.

2.1.4.1 Fuel Transfer, BMP A-5 Deviation Request

CAESB proposes to store fuel 500 ft. from Lake M0654 to comply with BLM Best Management Practice (BMP) A-5. However, their proposed airstrip is on the lake and fuel would need to be transported from the plane to the fuel storage location. CAESB requests a deviation from BMP A-5 and submitted the following for BLM consideration:

“The fuel provider’s plane will land at the Lake M0654 ice airstrip (see Figure 5) and stage at the turnaround area on the northeastern end of the runway. A 4,000 gallon (gal) capacity fuel truck staged at the shore camp ice pad will access the airstrip via the ice spur road and park alongside the aircraft. During the transfer, a bonding cable will be placed between the plane and the fuel truck, and duck ponds will be placed at each end of the transfer line. The fuel will be pumped using a diesel pump with trained fuelers staged at the nozzle and top hatch of the fuel truck. Once the transfer has been completed, the fuel truck will drive directly to the shore camp ice pad, which is at least 500 feet (ft) away from both the edge of the airstrip and the edge of Lake M0654.

Transfers between the fuel truck and the tank farm will mimic the transfer from the plane to the truck. A bonding cable will be placed between the fuel truck and the tanks, with duck ponds placed at each end of the transfer line. Trained fuelers, one at the nozzle and one at the top hatch of the tank, will use a diesel pump to transfer the fuel. The proposed fuel transfer procedures are consistent with the Spill Prevention Control and Countermeasures

plan (SPCC) for the fuel tank farm at the shore camp ice pad; fuelers would conduct the work in accordance with the guidelines and transfer checklist included in the SPCC.

The same fuel transfer procedures could be implemented with two fuel sloops (each 2,500 gal) that will be staged at the shore camp ice pad in the event that the fuel truck is not available due to maintenance or other reasons.

CEASB acknowledges that BMP A-5 prohibits refueling of equipment within 500 ft of the active floodplain of any water body with the objective of minimizing the impact of contaminants from refueling operations on fish, wildlife and the environment. While the fuel transfers as described would occur at Lake M0654, CEASB' proposes alternative BMPs that achieve the same objective:

Two trained personnel will conduct and monitor all fuel transfers, which would ensure prevention, early detection, shutoff, and cleanup of spills.

Duck ponds will be placed at the most likely discharge points in order to catch any drips or spills.

The ice airstrip will be built to a height of 3 ft above the surface of the lake; the constructed ice will serve as an impermeable barrier to spilled fuel.

The fuel truck and fuel sloops will each carry a spill kit for clean-up activities, and an Alaska Clean Seas spill technician will be available to assist with clean-up as needed.

The site of any drips or spills would be scraped clean and the contaminated ice/snow transported offsite for disposal.

The proposed method was successfully implemented by NordAq Energy Alaska, Inc. and their contractors last year without incidents. While Caelus explored an alternative fuel transfer scenario with Alaska Air Fuel, that would have required expansion of the shore camp ice pad in order to allow sufficient room for the aircraft to maneuver around the fuel tanks located at the ice pad. There were concerns about having the aircraft taxi from the airstrip to the shore camp ice pad, partially due to the change in elevation. High wind events can create low-visibility conditions that could potentially increase the risk of collisions with other traffic on the ice pad. Ultimately Caelus determined that the benefit of conducting the fuel transfer at the shore camp ice pad was outweighed by the potential risks and proposes the described fuel transfer procedures at the Lake M0654 ice airstrip best meet the objectives of both safety and preventative water quality.

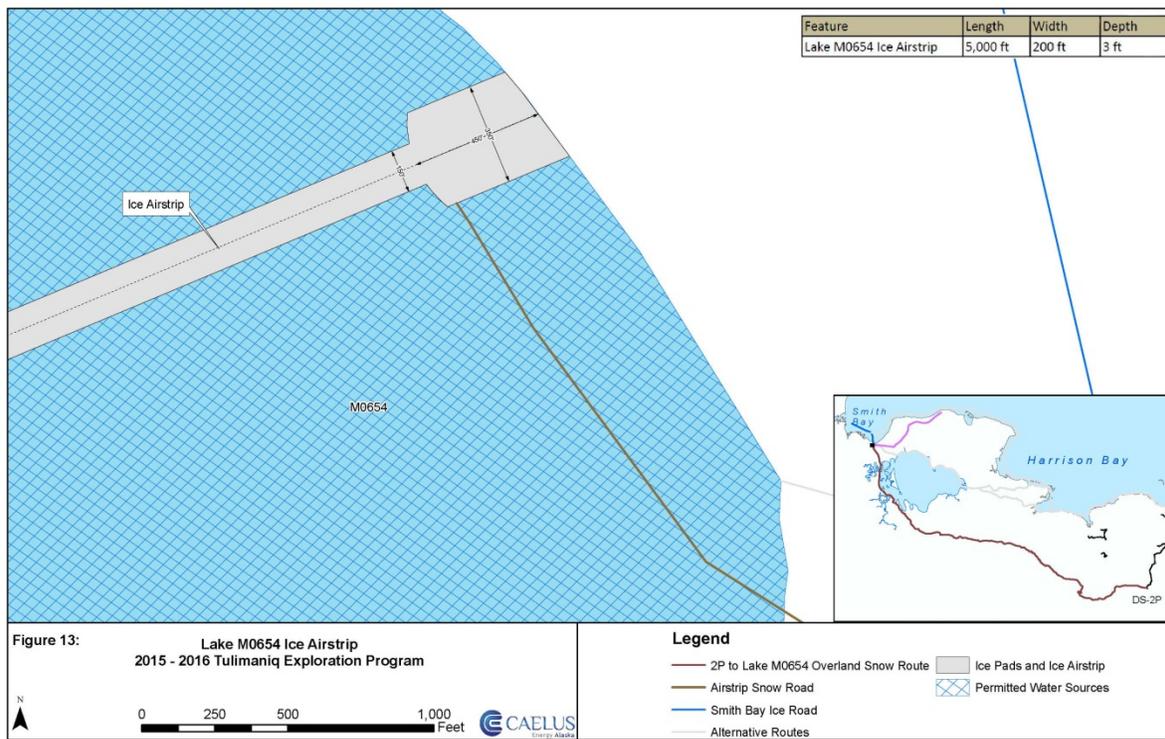


Figure 5: Lake M0654 Ice Airstrip

2.1.5 Waste Management

Waste management would be based on waste minimization and disposal and would comply with federal, state, and local regulations to prevent attracting wildlife. All solid waste would be temporarily stored at each site pending shipment from the area. Non-putrescible waste would be stored at the drill sites and would be transported overland to an approved disposal facility. Food and other putrescible waste would be stored in enclosed wildlife-resistant containers.

Camp wastewater would be processed through the camp wastewater treatment and discharged in accordance with the North Slope General Permit No. AKG-57-2000. CEASB states that the treatment system would meet federal and state requirements.

Water based drilling fluids would be used through all phases of well construction (non BLM managed lands). Non-hazardous Underground Injection Control Class II fluids would require temporary on-site storage and disposal. Drilling fluids would be injected or transported to a Prudhoe Bay disposal facility. The injection would take place at the well location off-shore and not on BLM managed land. Liquid wastes, including processed fluids, would be temporarily stored on the ice drilling pads in accordance with federal and state regulations.

The cuttings would be placed in cutting bins in a temporary storage cell with secondary containment consisting of ice berms and/or impermeable liner and transported to Prudhoe Bay

for disposal at a permitted grind and inject facility. CEASB would conform with and use the ADEC air permit for exploration drilling at their off-shore location on State of Alaska submerged lands. Sources of air emissions from the operation are rig engines, camp generator engines, steam generators, engine-driven pumps, hot-air heaters, light plants, and well test flaring equipment. All major equipment would be fired with ultra-low-sulfur diesel fuel.

2.1.6 Contingency Plans

2.1.6.1 Wildlife Protection and Encounter Plans

CEASB would implement practices to minimize wildlife attraction to the winter operations. CEASB submitted a Wildlife Avoidance and Interaction Plan to the BLM on September 11, 2015, and a revised/updated plan on October 12, 2015. The procedures contained in the plan would apply whether a polar or grizzly/brown bear is encountered. The camps and drillsite designs and CEASB policies include storing food inside buildings or containers to minimize odors are designed to prevent bear encounters. Feeding or attracting wildlife is prohibited by CEASB policy (also forbidden by BMP A-2). Hazardous materials would be kept in drums or other secure containers.

CEASB applied to the USFWS on August 24, 2015 for a Letter of Authorization (LOA) for the incidental and intentional take of polar bears.

Wildlife that may be in the project vicinity during winter exploration includes owls, ravens, arctic fox, musk ox, and a small number of over-wintering caribou. The project is located in waters less than 10 ft deep and it is unlikely to encounter seals or seal lairs. It is likely that polar bears would be encountered in the drilling operations area. Grizzly/brown bears are unlikely to be active in the winter. CEASB and its contractors would be cautious and watch for evidence of bears. CEASB policy requires sightings to be reported immediately to the site superintendent. If a polar bear den site is identified the U.S. Fish and Wildlife Service (USFWS) would be notified and activities would be altered to avoid disturbing the bear (BLM would also require notification). Grizzly/brown bear sightings would be reported to the ADFG.

2.16.2 Oil Discharge Prevention and Contingency Plan

An Oil Discharge Prevention and Contingency Plan (ODPCP) has been prepared for this project. The approved plan would be kept on site at all times for guidance in controlling and cleaning up any accidental discharges of fuels, lubricants, or produced fluids. The plan would include immediate response actions, receiving environments, spill cleanup mobilization response times, and well control.

2.16.3 Spill Prevention and Countermeasure Plan

CEASB's various contractors would maintain SPCC plans for drilling, fuel storage facilities, drilling operations, and well testing tanks. The plan includes fuel storage facilities for the camps.

Other contractors needing to store fuel would have SPCC plans covering their specific fuel storage and transfer operations.

2.16.4 Weed Management Plan

CEASB submitted an Invasive Species Mitigation Plan for BLM's approval on October 12, 2015. Cruz Construction, Inc. (Cruz) has been contracted by CEASB to provide the logistical operations for the proposed project. Cruz wrote the Weed Management Plan that CEASB submitted for their proposed activities. Cruz provided details on their procedure to assure that all equipment is properly maintained, inspected for leaks and serviceability, cleaned of all organic material, and prepared appropriately for remote service. All equipment is steam cleaned at their Deadhorse heated indoor shop prior to use.

2.1.6.5 Orientation Plan

CEASB submitted an Orientation Plan to the BLM for approval on October 12, 2015. All employees working on the Tulimaniq exploration project would be required to receive training, which would include project area orientation, threatened and endangered species information, environmental, social, and cultural awareness, subsistence conflict avoidance, and pertinent mitigation that would be project specific. All personnel would be required to attend annual training. Training records would be maintained while the site is active.

Project related North Slope employees and contractors are required to complete an 8-hour training provided by the North Slope Training Cooperative. A Field Environmental Handbook, Alaska Safety Handbook, and a North Slope Visitor's Guide are used in the training. The training includes classes on the Alaska Safety Handbook, personal protective equipment, camp and safety orientation, hazard communication, HAZWOPER⁵ Level I, environmental awareness hydrogen sulfide awareness, hearing conservation, electrical safety, respiratory protection, energy isolation, confined space entry, asbestos awareness, fall protection/avoidance, toxic substance control, first aid/CPR⁶, and use of an automated external defibrillator.

2.1.6.6 Subsistence Plan

CEASB submitted a subsistence Plan entitled "Subsistence Plan of Cooperation and Good Neighbor Plan" to the BLM on September 11, 2015. CEASB would follow the plan that describes CEASB's means of communication with the communities and a code of conduct expected of employees and contractors. Community consultations are closely linked to the plan, and further documents CEASB's efforts to maintain communications with residents and subsistence hunters.

Hiring opportunities are limited during exploration drilling. However, subsistence advisors at well sites during operations, translators, and Native elders who are willing to share traditional

⁵ Hazardous Waste Operations and Emergency Response – a set of guidelines produced and maintained by the United States Occupational Safety and health Administration.

⁶ Cardiopulmonary resuscitation

knowledge of the area, and others have been and would continue to be hired for the exploration project. Applicable traditional knowledge would be used during the project orientation training section.

Caelus supports a Subsistence Mitigation Fund with representatives from the Native Village of Nuiqsut, Kuukpik Corporation, and the City of Nuiqsut. The Subsistence Mitigation Fund is intended to mitigate subsistence impacts, if any, by using the fund to reimburse additional subsistence harvest costs that may result from CEASB's operations.

Caelus has a liaison in Nuiqsut and subsistence monitors, the latter work onsite as part of the Tulimaniq support staff. The liaison position is responsible for coordinating with the community on company plans and to review these activities for any potential impacts to subsistence resources. The subsistence monitors or advisors help identify and minimize conflicts with subsistence activities.

Through coordination with the North Slope Borough, the Iñupiat Community of the Arctic Slope, and the Native Village of Barrow, CEASB has identified native allotment holders and cabin and camp owners near any of the proposed travel routes. Each allotment holder and cabin owner would receive a letter notifying them of CEASB's intended activity and a means to notify CEASB should they have any questions or comments about the project.

CEASB would continue to communicate with stakeholders through public announcements on radio and television, project information newsletters, community meetings, and the NPR-A subsistence advisory panel.

2.1.6.7 Other plans

All emergency response situations would be managed by the Incident Management Team (IMT) which would follow the Incident Command System and the Alaska Unified Plan. The IMT is on call 24-hours a day. Personnel involved in an emergency situation would immediately notify the IMT for response. CEASB Environmental Health and Safety Policies and Procedures Manual and Emergency Response Plans will be available at the individual facilities.

2.1.7 Project End

At the end of the 2015-2016 drilling season, all equipment would be demobilized to Deadhorse via the DS- 2P overland route, conditions allowing (see Figure 1). Possible alternative demobilization routes are the same as the contingency routes identified for mobilization. If a Deadhorse demobilization is prevented due to weather and tundra travel closure, materials and equipment would be transported to Point Lonely for temporary staging until the 2016 open water season, when all of the loads would be barged to Prudhoe Bay. Locations with temporary snow/ice infrastructure would be cleaned of all debris and potential contamination and allowed to naturally degrade (thaw) in the spring to their original state. The surfaces would be inspected for spills, if any, and scraped clean before being allowed to naturally degrade. Because of the ice

pad and ice airstrip depths (2-3 feet), CEASB does not anticipate the need to ensure timely melting of either feature.

CEASB would collect refuse, including delineators, along the snow roads. The cost of scraping the entire length of all snow roads is cost-prohibitive, so the routes used would be inspected for spills and these areas of the snow road would be scraped clean before being allowed to naturally degrade. Because the overland routes are snow roads, as opposed to ice roads, CEASB does not anticipate the need for slotting stream crossings (See Table 2.6 for stream crossings).