

**Mitigation Measures
Beaufort Sea Areawide
June 28, 2019**

Operations will be conditioned by mitigation measures that are attached to all leases issued and are binding on the lessee. These measures were developed to mitigate potential effects of lease-related activities, considering all information made known to the director. Additional measures may be imposed when the lessee submits a proposed plan of operations (11 AAC 83.158(e) and 11 AAC 83.346(e)) for exploration, production, development, or transportation uses, or in rights-of-way for other pipelines. The director may consult with local government organizations and other agencies in implementing the mitigation measures below. The lessee is subject to applicable local, state, and federal laws and regulations, as amended.

The director may grant exceptions to these mitigation measures upon a showing by the lessee that compliance with the mitigation measure is not practicable and that the lessee will undertake an equal or better alternative to satisfy the intent of the mitigation measure. Requests and justifications for exceptions must be included in the plan of operations application as specified by the application instructions, and decisions of whether to grant exceptions will be made during the plan of operations review.

A. Mitigation Measures

1. Facilities and Operations

- a. Oil and gas facilities, including pipelines, will be designed using industry-accepted engineering codes and standards. Technical submittals to the Division of Oil and Gas (DO&G) that reflect the "practice of engineering," as defined by AS 08.48.341, must be sealed by a professional engineer registered in the State of Alaska.
- b. A plan of operations will be submitted and approved before conducting exploration, development, or production activities in accordance with 11 AAC 83.
- c. Facilities will be designed and operated to minimize sight and sound impacts in areas of high residential, recreational, and subsistence use and important wildlife habitat.
- d. The siting of facilities, including roads, airstrips, and pipelines, is prohibited within ½ mile of the coast as measured from the mean high water mark and 500 feet of all fish bearing waterbodies.
- e. Notwithstanding (d) above, the siting of facilities is prohibited within ½ mile of the banks of the Colville, Canning, Sagavanirktok, Shaviovik, Kadleroshilik, and Kuparuk Rivers as measured from the ordinary high water mark. Facilities may be sited, on a case-by-case basis, within the ½ mile buffer if the lessee demonstrates that siting of such facilities outside this buffer zone is not feasible or prudent, or that a location within the buffer is environmentally preferable.
- f. Impacts to important wetlands will be minimized to the satisfaction of the director, in consultation with the Alaska Department of Fish and Game (ADF&G) and Alaska Department of Environmental Conservation (ADEC). The director will consider whether facilities are sited in the least sensitive areas.
- g. Exploration roads, pads, and airstrips will be temporary and constructed of ice. Use of gravel roads, pads, and airstrips may be permitted on a case-by-case basis by the director, in consultation with Division of Mining, Land, and Water (DMLW) and ADF&G.
- h. Road and pipeline crossings will be aligned perpendicular or near perpendicular to watercourses.
- i. Pipelines

- i. In areas with above ground placement, pipelines will be designed, sited, and constructed to allow for the free movement of wildlife and to avoid significant alteration of caribou and other large ungulate movement and migration patterns.
- ii. At a minimum, above ground pipelines will be elevated 7 feet, as measured from the ground to the bottom of the pipeline, except where the pipeline intersects a road, pad, or a ramp installed to facilitate wildlife passage. A lessee will consider snow depth in relation to pipe elevation to ensure adequate clearance for wildlife.
- iii. Pipelines and gravel pads will facilitate the containment and cleanup of spilled fluids.
- iv. Pipelines must be located and constructed in consultation with ADF&G and the local borough.
- j. Causeways and docks will not be located in river mouths or deltas. Approved causeways will be designed, sited, and constructed to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics (e.g., salinity, temperature, suspended sediments) that result in exceedances of water quality criteria, and must maintain free passage of marine and anadromous fish.
- k. Artificial gravel islands and bottom founded structures will not be located in river mouths or active stream channels on river deltas, except as provided for in (l) below
- l. Each proposed structure will be reviewed on a case-by-case basis. Causeways, docks, artificial gravel islands and bottom founded structures may be permitted if the director, in consultation with ADF&G and ADEC, and the North Slope Borough (NSB), determines that a causeway or other structures are necessary for field development and that no practicable alternatives exist. A monitoring program may be required to address the objectives of water quality and free passage of fish, and mitigation will be required where significant deviation from objectives occurs.
- m. Upon abandonment of material sites, drilling sites, roads, buildings or other facilities, such facilities must be removed and the site rehabilitated to the satisfaction of the state, unless the state, in consultation with any non-state surface owner, as applicable, determines that such removal and rehabilitation is not in the state's interest.
- n. The director may include plan stipulations if necessary to reduce or eliminate adverse impacts to fish and wildlife or to protect the environment.

2. Fish, Wildlife, and Habitat

- a. The lessee will consult with the NSB before proposing the use of explosives for seismic surveys. The director may approve the use of explosives for seismic surveys after consultation with the NSB.
- b. Any water intake structures in fish bearing or non-fish bearing waters will be designed, operated, and maintained to prevent fish entrapment, entrainment, or injury. All water withdrawal equipment must be equipped and must use fish screening devices approved by ADF&G.
- c. Removal of snow from fish-bearing rivers, streams, and natural lakes will be subject to prior written approval by ADF&G. Compaction of snow cover overlying fish-bearing waterbodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, then ice or snow bridges may be required.
- d. Bears:

- i. For projects in proximity to areas frequented by bears, the lessee is required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan will include measures to:
 - A. minimize attraction of bears to facility sites;
 - B. organize layout of buildings and work areas to minimize interactions between humans and bears;
 - C. warn personnel of bears near or on facilities and the proper actions to take;
 - D. if authorized, deter bears from the drill site;
 - E. provide contingencies in the event bears do not leave the site;
 - F. discuss proper storage and disposal of materials that may be toxic to bears; and
 - G. provide a systematic record of bears on the site and in the immediate area.
- ii. Brown bears
 - A. A lessee must consult with ADF&G before commencing any activities to identify the locations of known brown bear den sites that are occupied in the season of proposed activities.
 - B. Exploration and production activities will not be conducted within ½ mile of occupied brown bear dens unless alternative mitigation measures are approved by ADF&G.
 - C. A lessee who encounters an occupied brown bear den not previously identified by ADF&G will report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. The lessee will avoid conducting mobile activities ½ mile from discovered occupied dens unless alternative mitigation measures are approved by the director, with concurrence from ADF&G. Non-mobile facilities will not be required to relocate.
- iii. Polar Bears
 - A. Consultation with the US Fish and Wildlife Service (USFWS) is required prior to commencement of any activities as required by the Endangered Species Act, and also to identify the locations of known polar bear den sites.
 - B. Operations will avoid known polar bear dens by at least 1 mile unless alternative mitigation measures are approved by USFWS.
 - C. A lessee who encounters an occupied polar bear den not previously identified by USFWS will report it to the USFWS within 24 hours and subsequently avoid the new den by at least 1 mile unless alternative mitigation measures are approved by USFWS.
 - D. If a polar bear should den within an existing development, off-site activities will be restricted to minimize disturbance.
- e. Permanent, staffed facilities will be sited to the extent practicable outside identified brant, white-fronted goose, snow goose, tundra swan, king eider, common eider, spectacled eider, and yellow-billed loon nesting and brood rearing areas on lease tracts where the lease tract is entirely onshore or has onshore components.

- f. Due to high concentrations of staging and molting brant and other waterbirds within the coastal habitats along the Teshekpuk Lake Special Area (TLSA) and other areas, operations that create high levels of disturbance, including but not limited to dredging, and boat and barge traffic along the coast, will be prohibited from June 20 to September 15 within ½ mile of coastal salt marshes, specifically tracts 187, 209, 320, 483-485, 493, 494, 496, 497, 500-514, 517-519, 524, and 530. In addition, tracts 228 and 231, tracts 521-526, and tract 537 are subject to the same restrictions between May 15 and July 30 to protect large concentrations of breeding snow geese. The construction and siting of facilities within 1 mile of these areas may be allowed on a case-by-case basis if the director and ADF&G determine that no other feasible and prudent location exists.
- g. The director, in consultation with ADF&G, may impose additional and seasonal restrictions on activities located in, or requiring travel through or overflight of, important caribou or other large ungulate calving and wintering areas during the plan of operations approval stage.

3. Subsistence, Commercial, and Sport Harvest Activities

- a. Lease-related use may be restricted if necessary to prevent unreasonable conflicts with subsistence, commercial, or sport fish and wildlife harvest activities. Reasonable access to subsistence areas, as defined in Section B, will be maintained unless reasonable alternative access is provided to subsistence users. "Reasonable access" is access using means generally available to subsistence users. The lessee will consult the NSB, nearby communities, and native organizations for assistance in identifying and contacting local subsistence users.
- b. Before submitting a plan of operations that has the potential to disrupt subsistence activities, the lessee will consult with the potentially affected subsistence communities, the Alaska Eskimo Whaling Commission (AEWC), and the NSB (collectively "parties") to discuss the siting, timing, and methods of proposed operations and safeguards or mitigating measures that could be implemented by the operator to prevent unreasonable conflicts. The parties will also discuss the reasonably foreseeable effect on subsistence activities of any other operations in the area that they know will occur during the lessee's proposed operations. Through this consultation, the lessee will make reasonable efforts to ensure that exploration, development, and production activities are compatible with subsistence hunting and fishing activities and will not result in unreasonable interference with subsistence harvests.
- c. Whale Harvest Protection:
 - i. Permanent facility siting on Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the NSB, in consultation with the AEWC, that the development will not preclude reasonable access to whales as defined in Section B and as may be determined in a conflict avoidance agreement, if required by the NSB. With the approval of the NSB, the director may authorize permanent facilities.
 - ii. Permanent facility siting in state waters within 3 miles of Cross Island will be prohibited unless the lessee demonstrates to the satisfaction of the director, in consultation with the NSB and the AEWC, that the development will not preclude reasonable access to whales as defined in Section B and as may be determined in a conflict avoidance agreement if required by the NSB.
 - iii. Permanent facility siting in state waters between the west end of Arey Island and the east end of Barter Island (tracts 40 through 45) will be prohibited unless the lessee demonstrates to the satisfaction of the director, in consultation with the NSB and the AEWC, that the development will not preclude reasonable access to whales as defined in Section B and as may be determined in a conflict avoidance agreement if required by the NSB.

- d. Any tract or portion thereof in the Beaufort Sea Areawide lease sale area may be subject to seasonal drilling restrictions in conjunction with the submission of a plan of operations permit application by the lessee.
- i. Exploratory Drilling from Bottom-founded Drilling Structures and Natural and Gravel Islands: Subject to measure iii below, exploratory drilling operations and other downhole operations from bottom-founded drilling structures and natural and gravel islands are allowed year-round in the Central Subsistence Whaling Zone (SWZ)¹. In the Eastern SWZ, drilling is prohibited upon commencement of the fall bowhead whale migration until whaling quotas have been met.
- ii. Exploratory Drilling Operations from Floating Drilling Structures: Subject to measure iii below, exploratory drilling below a predetermined threshold depth and other downhole operations from floating drilling structures is prohibited throughout the Beaufort Sea upon commencement of the fall bowhead whale migration until the whale migration mid-point.²

In addition to the above restriction, exploratory drilling above and below a predetermined threshold depth in the Eastern SWA from floating drilling structures is prohibited upon commencement of the fall bowhead whale migration until the whaling quotas have been met.

In the Central and Western SWZ, exploratory drilling above and below a predetermined threshold depth may be prohibited on a case-by-case basis until the whaling quotas have been met.³ The following criteria will be used to evaluate these operations: 1) proximity of drilling operations to active or proposed whaling areas, 2) drilling operation type and feasible drilling alternatives, 3) number of drilling operations in the same area, 4) number of whaling crews in the area, and 5) the operator's plans to coordinate activities with the whaling crews in accordance with Mitigation Measure A3a.

All non-essential activities associated with drilling are prohibited in the Central SWZ during the whale migration until whaling quotas have been met. Essential support activity associated with drilling structures occurring within active whaling areas shall be coordinated with local whaling crews in accordance with Mitigation Measure A3b.

"Essential activities" include those necessary to maintain well control, maintain physical integrity of the drilling structure, and scheduled crew changes. Support craft include aircraft, boats, and barges. "Non-essential activity," by exclusion, are those activities that do not fit the definition of essential activities. Both types of activities must be described by the operators in their plans submitted for state review. To the extent feasible, mobilization or demobilization of the drilling structures should not occur during the whale migration. If operators propose to mobilize or demobilize during the whale migration, they must describe the activity in their exploration plan and must demonstrate why the activity must occur during the migration period.

¹ Subsistence Whaling Zones:

Eastern SWZ is that area within 20 nautical miles of the shoreline between 141° and 144° W longitude.
Central SWZ is that area within 20 nautical miles of the shoreline between 144° and 151° W longitude.
Western SWZ is that area within 20 nautical miles of the shoreline between 154° and 157° W longitude.

² Migration Dates:

Eastern SWZ – September 1 – October 10 with the midpoint of the migration on September 20.
Central SWZ and Western SWZ – September 10 – October 20 with the midpoint of the migration on September 28.
Outside SWZ – Seaward of the Eastern SWZ – September 1 – October 10 with the midpoint of the migration on September 20; Seaward and west of the Central SWZ – September 10 – October 20 with the midpoint of migration on September 28. The midpoint of the migration is when 50 percent of the whales have been deemed to have passed the drill site.

³ If upon review of the proposed operation using the above described criteria, the state determines that conflict with subsistence whaling activities may occur, additional drilling restrictions, similar to those imposed for the Eastern SWZ, may be imposed in the Central and Western SWZ's. In the Eastern SWZ, drilling is prohibited upon commencement of the fall bowhead migration until whaling quotas have been met.

- iii. Exploratory Drilling in Broken Ice: Lessees conducting drilling operations during periods of broken ice must:
 - A. be trained and qualified in accordance with Bureau of Safety and Environmental Enforcement standards pertaining to well-control equipment and techniques;
 - B. have an oil spill contingency plan approved by the state that includes requirements for in situ igniters, fire resistant boom, relief well plans, and a decision process for igniting an uncontrolled release of oil; and
 - C. participate in an oil spill research program.
- e. Exploration, development and production activities located on lease tracts 1 through 26 shall be conducted in a manner that prevents unreasonable conflicts between oil and gas activities and subsistence whale hunting.
 - i. Before submitting a plan of operations for activities on lease tracts 1 through 26, the lessee shall consult with the NSB, the AEWC, and the community of Kaktovik to discuss how the siting, timing, and methods of proposed operations can be planned and carried out to avoid potential conflicts with subsistence whale hunting. Through this consultation, which may include the negotiation of a conflict avoidance agreement, the lessee shall make every reasonable effort to ensure that their activities will not result in unreasonable interference with subsistence whale hunting.
 - ii. A plan of operations for activities on lease tracts 1 through 26 shall include a discussion of the consultation process and any resulting conflict avoidance agreements. In the event that no agreement is reached, the lessee, the NSB, the AEWC, or the community of Kaktovik may request that the Alaska Department of Natural Resources (DNR) call a meeting of representatives of the NSB, the AEWC, the community of Kaktovik, and the lessee to discuss the potential conflict caused by the proposed activities, and attempt to resolve the issues. If the parties are still unable to reach an agreement, then DNR will make a final determination of the measures proposed to be taken to prevent unreasonable interference with subsistence whale hunting.

4. Fuel, Hazardous Substances, and Waste

- a. The lessee will ensure that secondary containment is provided for the storage of fuel or hazardous substances and sized as appropriate to container type and according to governing regulatory requirements in 18 AAC 75 and 40 CFR 112. Containers with an aggregate storage capacity of greater than 55 gallons that contain fuel or hazardous substances will not be stored within 100 feet of a water body or within 1,500 feet of a current surface drinking water source.
- b. During equipment storage or maintenance, the lessee will ensure that the site is protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner or other suitable containment mechanism.
- c. During fuel or hazardous substance transfer, the lessee will ensure that a secondary containment or a surface liner is placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to 5 gallons, must be on hand during any transfer or handling of fuel or hazardous substances.

- d. The lessee will ensure that vehicle refueling will not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.
- e. The lessee will ensure that all independent fuel and hazardous substance containers are permanently marked with the contents and the lessee's or contractor's name.
- f. The lessee will ensure that waste from operations is reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated whenever possible or disposed of at an approved site in accordance with 18 AAC 60.
- g. Proper disposal of garbage and putrescible waste is essential to minimize attraction of wildlife. The lessee must use the most appropriate and efficient method to achieve this goal. The primary method of garbage and putrescible waste is prompt, on-site incineration in compliance with State of Alaska air quality regulations. The secondary method of disposal is on-site frozen storage in animal-proof containers with backhaul to an approved waste disposal facility. The tertiary method of disposal is on-site non-frozen storage in animal proof containers with backhaul to an approved waste disposal facility. Daily backhauling of non-frozen waste is required unless safety considerations prevent it.
- h. New solid waste disposal sites, other than for drilling waste, will not be approved or located on state property for exploration.
- i. The preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. The lessee will ensure that drilling mud and cuttings will not be discharged into lakes, streams, rivers, or wetlands. On-pad temporary cuttings storage may be allowed as necessary to facilitate annular injection and backhaul operations.

5. Access

- a. Exploration activities must be supported only by ice roads, winter trails, existing road systems, or air service. Wintertime off-road travel across tundra and wetlands may be approved in areas where snow and frost depths are sufficient to protect the ground surface.
- b. Summertime off-road travel across tundra and wetlands may be authorized subject to time periods and vehicle types approved by DMLW.
- c. Emergency exceptions may be granted by the director of DMLW, or the director of DO&G, if it is determined that travel can be accomplished without damaging vegetation or the ground surface on a site-specific basis.
- d. Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related structures. Areas of restricted access must be identified in the plan of operations.

6. Historic, Prehistoric, and Archaeological Sites

- a. Before the construction or placement of any structure, road, or facility supporting exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archeological sites within the area, including a detailed analysis of the effects that might result from that construction or placement.
- b. The inventory of prehistoric, historic, and archeological sites must be submitted to the director and the Office of History and Archeology (OHA) who will coordinate with the NSB for review and comment. If a prehistoric, historic, or archeological site or area could be adversely affected by a lease activity, the director, after consultation with OHA and the NSB, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.

- c. If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee will report the discovery to the director as soon as possible. The lessee will make all reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the director, after consultation with the OHA and the NSB, has directed the lessee on the course of action to take for its preservation.

7. Hiring Practices

- a. The lessee is encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. The lessee will submit, as part of the plan of operations, a hiring plan that will include a description of the operator's plans for partnering with local communities to recruit, hire, and train local and Alaska residents and contractors. As a part of this plan, the lessee is encouraged to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.
- b. A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.
- c. A plan of operations application must include a training program
 - i. for all personnel including contractors and subcontractors;
 - ii. designed to inform each person working on the project of environmental, social, and cultural concerns that relate to that person's job;
 - iii. using methods to ensure personnel understand and use techniques necessary to preserve geological, archeological, and biological resources; and
 - iv. designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles in areas where they will be operating.

B. Definitions

Facilities – Any structure, equipment, or improvement to the surface, whether temporary or permanent, including, but not limited to, roads, pads, pits, pipelines, power lines, generators, utilities, airstrips, wells, compressors, drill rigs, camps, and buildings.

Hazardous substance – As defined under 42 USC 9601 – 9675 (Comprehensive Environmental Response, Compensation, and Liability Act of 1980).

Important wetlands – Those wetlands that are of high value to fish, waterfowl, and shorebirds because of their unique characteristics or scarcity in the region or that have been determined to function at a high level using the hydrogeomorphic approach.

Minimize – To reduce adverse impacts to the smallest amount, extent, duration, size, or degree reasonable in light of the environmental, social, or economic costs of further reduction.

Plan of operation – A lease plan of operations under 11 AAC 83.158 and a unit plan of operations under 11 AAC 83.346.

Practicable – Feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the mitigation measure.

Reasonable access – Access using means generally available to subsistence users.

Secondary containment – An impermeable diked area, portable impermeable containment structure, or integral containment space capable of containing the volume of the largest independent container. The containment will, in the case of external containment, have enough additional capacity to allow for local precipitation.

Temporary – No more than 12 months.