Environment Canada Environnement Canada

Prairie and Northern Region
Environmental Protection Operations (EPO) Directorate
5019 52nd Street, 4th Floor
Yellowknife, NT X1A 2P7

November 8, 2013

EC File No.: 5410 000 027 /003
EISC File No.: 09-13-01

Darrell Christie
EIS Coordinator
Environmental Impact Screening Committee
Joint Secretariat, Inuvialuit Settlement Region
Inuvik, NT X0E 0T0

Via Email at eisc@jointsec.nt.ca

Attention: Mr. Christie

**RE: EISC 09-13-01 – Beaufort Sea Exploration Joint Venture Drilling Program – Imperial Oil Resources Ventures Ltd.**

Environment Canada (EC) has reviewed the information submitted by Imperial Oil Resources Ventures Ltd. (the Proponent) to the Environmental Impact Screening Committee with the above-mentioned application. The specialist advice provided in the attached comments and recommendations table is provided pursuant to EC's mandated responsibilities arising from the *Canadian Environmental Protection Act, 1999*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act, 1994* and the *Species at Risk Act*.

EC understands the Proponent and its co-venturers in the Beaufort Sea Exploration Joint Venture (ExxonMobil Canada Ltd. and BP Exploration Operating Company Limited) are applying to drill one or more exploration wells within exploration licence (EL) 476 (Ajurak) or EL 477 (Pokak), located within the Beaufort Sea to:

- Determine if hydrocarbons are present in one or more geological structures;
- Determine the composition of any hydrocarbons found;
- Identify the boundaries of the prospects to apply for a Significant Discovery Licence (SDL);
- Identify the potential for future exploration or development drilling; and
- Determine if there is a potential for commercial production.

The comments and recommendations provided by EC in the attached table are based on the information provided to date in the Proponent's application. EC expects there will be further opportunities to provide comments, recommendations and/or information requests as more information becomes available during the screening or review process.

If you have any questions regarding EC's submission, please do not hesitate to contact me at (867) 669-4744 or loretta.ransom@ec.gc.ca.

Sincerely,

Loretta Ransom
Senior Environmental Assessment Coordinator, EPO

cc: Sherry Becker (Beaufort/East Coast Opportunity Manager, Beaufort Sea Exploration Joint Venture, beaufortsea.project@esso.ca)
Carey Ogilvie (Head, EA North, EPO, EC)
Mark Dahl (Environmental Assessment & Ocean Disposal Specialist, EPO, EC)
Paula Smith (Environmental Assessment Coordinator, Canadian Wildlife Service, EC)
Raymond Kotchorek (Environmental Assessment & Emergencies Analyst, EC)
Anne Wilson (Sector Specialist, EPO, EC)
Karissa, Aubie (Senior Policy Analyst, Oil, Gas and Alternative Energy Division, EC)

Beaufort Sea Exploration Joint Venture Drilling Program – Imperial Oil Resources Venture Limited (with ExxonMobil Canada Ltd. and BP Exploration Operating Company Limited)
EISC File 09-13-01
EC File 5410 000 027 /003
Date: November 8, 2013

Environment Canada Comments and Recommendations:

| Topic | Project Description Section | Comment | Recommendation |
|---|---|---|---|
| Roles | Section 4.1.2.3 | The narrative omits EC's *Fisheries Act* role. | EC recommends the pollution prevention sections of the Fisheries Act that are administered by EC be referenced in this section. |
| Contingency plans | 5.1.10<br>"Surface intervention would be the primary means of regaining well control and the fastest method to put in place. Other effective same – well intervention methods include activating the subsea BOP stack, which is typically the first option for regaining well control." | It is unclear what the primary/first option for well control is "surface methods" or "activation of BOP stack". | EC recommends the Proponent clearly identify the first/primary means of well control in their Contingency Plans. |
| Oil Spill Response Scenarios | Section 14.3 Non-Routine Events | The Proponent's references to potential "Minor" and "Major" oil spill incidents, their potential effects, spill fate in open water and ice, and oil spill response scenarios all seem to be limited to incidents that would occur during the open water drilling season of "July to October". | EC recommends the Proponent include potential worst-possible-case (Major) oil spill incidents (e.g. a sub-sea wellhead blowout), their potential effects, spill fate and respective spill response scenarios that could occur outside, or extend past, the open water drilling season.<br><br>EC recommends the Proponent adjust "Extent", "Duration" and "Significance of Residual Effects" for "Non-Routine Events - Major Spills" accordingly. |
| Oil Spill Response Scenarios | Section 10.1 Description of Biophysical Environment<br><br>10.1.4 Ocean Circulation and Currents in the Beaufort Sea | The Proponent refers to "*large-scale circulation features*" and highlights 1) the "*clockwise Beaufort Gyre*" atmospheric system [which equates to prevailing westerly winds], 2) the "*eastward transport of Pacific Ocean water*" that is "*…thought to occur as an episodic eastward-flowing shelf-break jet along the edge of the Beaufort Shelf…*", and 3) "*a deeper (greater than 200m) eastward movement of Atlantic Ocean water*" [2&3 equating to prevailing easterly water currents]. | EC recommends the Proponent elaborate on the effects of the westerly "*Beaufort Gyre*" atmospheric effect, in combination with and in contrast to the prevailing easterly water current flow, into all spill scenarios within the EL operating areas.<br><br>EC recommends the Proponent include the effects of the westerly "*Beaufort Gyre*" atmospheric effect, in combination with and in contrast to the easterly water current flow, into hydrologic trajectory models for all likely fuel tanker transit routes. |

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| Oil Spill Preparedness and Response Planning | Section 10.10 Marine Avifauna<br><br>10.10.8 Ecologically and Biologically Significant Areas | The Proponent refers to mitigation measures for "*biologically sensitive areas*" surrounding the project areas of operations | EC recommends the Proponent include proactive ecological sensitivity mapping and shoreline classification (as per EC classifications) to inform spill preparedness and response planning within and surrounding the EL project areas of operations. |
| Hydrologic Trajectory Modelling for Potential Contaminants | Section 6.7 Summary of the Proposed Development<br><br>6.7.1 Transit Routes | The Proponent does not mention any plans to undertake hydrologic trajectory modelling along likely fuel tanker transit routes. | EC recommends the Proponent include hydrologic trajectory modelling of all likely fuel tanker transit routes, using maximum payload volumes for all petroleum products transported in significant quantities. |
| Spill Treating Agents for Oil Spill Response | Section 14.3 Non-Routine Events | The Proponent indicates a seemingly significant reliance on (among others) the planned utilization of dispersants (both on the sea surface and subsea injection) and surfactants as oil spill response technologies for Tier-2 and Tier-3 level spills. | EC encourages the Proponent to include an acknowledgement that there is currently no approval mechanism within Canadian legislation for the utilization and application of Spill Treating Agents (STAs) in Canadian territorial waters.<br><br>The use of STAs may make the Proponent subject to prosecution under current federal legislation (e.g. Fisheries Act) – regardless of scientific input on, or assessment of net environmental benefit by government officials. |
| Arctic REET Contingency Plan | Section 14.3 Non-Routine Events<br><br>14.3.6 Oil Spill Response Plan<br><br>14.3.6.1 Emergency Response Plan | The Proponent indicates (and infers a reliance on) "*Environment Canada also has a key role in managing the Arctic Regional Environmental Emergencies Team Contingency Plan*" (Arctic REET) in assisting the Proponent by informing their spill response efforts. | EC wishes to inform the Proponent that the reference to EC's role in the management of the Arctic REET Contingency Plan has changed to reflect the new delivery structure of EC's Environmental Emergencies Program.<br><br>EC encourages the Proponent to update in their references of EC's role in the management of the Arctic REET Contingency Plan with that of the revised "Environment Canada Science Table" structure (a description of which is provided separately by EC) |
| Non-Routine Events – Types and locations of spills | 14.3.1/14.3.2 | Proponent indicates spills of other oil products are not addressed as it's a small fraction of the proposed project. | EC recommends the Proponent indicate what practices will be put into place to reduce the risk of smaller spills? EC recommends the Proponent provide a breakdown of volumes of diesel/crude oil expected versus other products. |
| Fuel tankers | 5.1.12.3<br>"The fuel tankers used would likely: have double hulls; be designed in accordance with Canadian regulations and international standards …;be | The use of the word "likely" in Section 5.1.12.3 suggests that the listed ship characteristics would be optional. | EC recommends the Proponent explain further why these ship characteristics would be considered optional and whether a commitment will be made to ensure the tankers to be used "will" have the listed characteristics. |

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| | capable of independent operations in the ice conditions expected between the port of departure and the licence area…" | | |
| Mitigation measures for routine program activities | 17.2.3.2<br>To allow shallow draft supply vessels access to the shore based facility, dredging might be required in some parts of Tuktoyaktuk Harbour, its entrance and near the shore based facility dock area. If dredging is required, a comprehensive assessment will be conducted to determine the most responsible method of disposing of dredging spoils, considering the environment and human health | EC is encouraged that the Proponent has committed to carrying out an assessment to determine the most responsible method of disposing of dredged material from the harbour. As the regulator responsible for the administration of disposal at sea permits, EC notes that the disposal at sea permitting process will involve characterization of the material to be dredged. Should the material be deemed uncontaminated it can be considered for disposal at sea however contaminated material is not acceptable for disposal at sea. | EC recommends alternate terrestrial based arrangements be explored to manage any contaminated dredge spoil. |
| Waste Management Services | Section 6.6.4<br>Section 14.2.12 | Onshore disposal of drilling unit and support ship wastes is planned, or alternatively shipment out of the licence areas. Does this include domestic wastewater? What will the ultimate disposal be for all waste types?<br>Section 14.2.12 concludes that interactions of waste disposal with the environment are likely to be negligible, and are not considered further. | EC recommends the Proponent specify waste types and proposed final disposal options. |
| Routine discharges | Section 14.2.4 | Routine discharges could include camp wastewater (greywater and sewage), washdown from decks and structures, cooling water, ballast water, and bilge water. Discharges will be addressed in a Waste Management Plan in accordance with the NEB's Offshore Waste Treatment Guideline and will meet applicable regulations.<br><br>Sewage will be processed through treatment plants; the level of treatment and expected effluent quality is not identified. | EC recommends characterization of routine wastewater discharges be conducted to ensure they are not deleterious to the marine environment. This could include chemical and toxicity testing. |
| Drilling | 14.2.7 – Drilling Impacts<br>14.2.7.1.1 | There is no indication of the potential volume of air emissions anticipated from this project. | EC recommends the Proponent provide more detail on the total anticipated emissions from the various components of the project (ships, drilling, completions, transport, shore based operations etc). |
| Drilling Fluids | Section 6.3.5 | "Water-based drilling fluids are used for the first and shallow-depth sections of the well…and the drilling fluid and drill cuttings are discharged to the seafloor. …between 1300 to | EC recommends characterization of drilling waste discharges be conducted to ensure they are not deleterious to the marine environment. This could include chemical and toxicity testing. |

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| | | 1500 $m^3$ of water-based cuttings.<br><br>Subsequent and deeper sections of the well would likely be drilled using non-aqueous drilling fluids (NADF). …treat the drill cuttings for discharge into the sea. Treated cuttings will be tested, and …discharged to the sea floor according to approval conditions."<br><br>Drilling waste discharges are regulated under offshore waste treatment guidelines, which specify oil-in-water concentrations and sampling frequencies. | |
| Well testing | 6.3.10.3<br>- Well testing could be carried out on any zone of interest. … well fluids would be allowed to flow to surface for a time….duration of the test might range from hours to days. The produced oil/gas could be flared if required by Regulator | It is unclear how produced oil and gas will be managed if flaring is not required. | EC recommends the Proponent provide information on how produced oil and gas will be managed if flaring is not required. |
| Monitors | TABLE 7-5<br>will hire marine mammal observers for beluga harvesting period | It is unclear if the marine monitors will also function as marine bird monitors. | EC recommends the Proponent clarify if the marine monitors will also function as marine bird monitors. |
| Environmental Monitoring | Section 16.3.2 Operations Integrity Management System | Management plans will be developed for a range of activities, including an Environmental Effects Monitoring Plan (16.3.9). Further information on monitoring plans will be provided upon referral to the EIRB. | EC recommends a conceptual monitoring plan be provided which includes a summary of baseline biophysical data which has been collected, proposed monitoring endpoints, sites and frequencies, and how data will be analysed, interpreted, and used to inform adaptive management. |
| Oceanography | 10.15.3<br>Erosion has been consistent 1972-2000 | It is unclear why the assessment of erosion did not include data more recent than 2000. The incorporation of more recent data may influence the conclusion that erosion has been consistent on the long term. | Should more recent data be available, EC recommends that the Proponent incorporate it into the assessment to ensure that the estimation of the trends in coastal erosion is as accurate as possible |
| Spatial Boundaries | 14.1.4.2<br>"In particular, the SSA includes the footprint of the drill site, the shore based facility, the area that might potentially be dredged in Tuktoyaktuk harbour…" | The Proponent indicates that the SSA will encompass all physical activities onshore and offshore and they specifically list the footprint of the offshore drill site but it is unclear if the disposal site for spoil from the preparation of the drill site would be included in the SSA | EC recommends the Proponent confirm that the disposal site to be used for managing dredge spoil from the drill site will be included in the Site Study Area. |

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| Effects criteria and Levels for determining significance | Table 14-3 | The magnitude ratings do not appear to be consistent across the VEC types. The threshold for "low" Magnitude impacts to ecological VECs appears higher than for Physical or Socio-economic VECs. Further "high" magnitude impacts on ecological VECs are much more dramatic than "high" impacts for Physical or Socio-economic. | EC recommends the Proponent clarify the basis for the criteria and levels used for determining significance. |
| Valued Ecosystem Components | Tables 5-1 and 5-2 | Selected VECs and program activities that would affect the marine environment are listed. Water quality should be included as a VEC. It is noted that Table 5-3 (Mitigation Measures for Routine Program Activities) touches on water quality, and including water quality would be consistent with subsequent evaluations. | EC recommends the Proponent add water quality as a Valued Ecosystem Component. |
| Human Health and Ecological Risk Assessment | Section 14.2.14 | The Proponent has indicated that it may not be possible to quantify the effects of the project at this time | EC recommends the Proponent provide more information on how it plans to determine the level of risk (if not quantitatively than qualitatively):<br>- Include information on relevant legislation and best practices to minimize risk; and<br>- Review current risk assessment methods and techniques already in use in Canada (Chemicals Management Plan and other sources). |
| Atmospheric Environment | 14.2.1.1, 14.2.3.1, 14.2.5.1.1<br>The sections discussing emissions related to transfer of supplies; drilling and dredging indicate that emissions from these activities would be similar to those described in section 14.2.1 (Vessel Transit and Presence). Section 14.2.1 indicates that heavy fuel will be burnt and that Imperial will meet regulations in place at time of mobilization. | Referring to Section 14.2.1.1 is somewhat confusing as it only discusses the emissions from marine engines burning heavy fuel. Section 14.2.1.1 does not address the additional emissions from engines used to support project related activities such as drilling, equipment transfer and dredging. These activities would involve the use of equipment such as: pumps, generators, cranes, dredges or drills. It is unclear what fuel this equipment would use and if the emissions from this equipment was included in the emission impact assessment. | EC recommends the Proponent clarify what fuel will be used in the equipment to be used for material transfer, drilling and dredging and should include emissions from this equipment in emission estimates and in the discussion of effects and mitigation. |
| Vessel transit and Presence and Coastal Landscapes | Table 14-4 and the text of the document discuss mitigations but in some cases does not commit to implementing them.<br>For example in 14.2.1.1.4 – indicate that reducing speed would minimize erosion but do not commit to the necessary speed reductions. | It is unclear if the mitigations are being presented as options available to the company or as commitments to be undertaken to mitigate impacts. | EC recommends the Proponent commit to the implementation of speed control and to considering shoreline erosion in ship route planning.<br><br>EC recommends the Proponent clarify if the listing of mitigations in Table 14-4 constitutes a commitment to implementing the mitigations. |

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| Migratory birds and Protected Areas within the Project area | Section 10<br>Description of the Biophysical Environment<br><br>10.10.8<br>Ecologically and Biologically Sensitive Areas | The following Protected Areas are within the Regional Study Area of the Project:<br><br>Banks Island Migratory Bird Sanctuary No. 1<br>Banks Island Migratory Bird Sanctuary No. 2<br>Anderson River Delta Migratory Bird Sanctuary<br>Kendall Island Migratory Bird Sanctuary<br>Cape Parry Migratory Bird Sanctuary<br><br>The following Key Habitat Sites are within the Regional Study Area of the Project:<br><br>Prince Patrick Island<br>Thomsen River<br>Banks Island Migratory Bird Sanctuary No. 1<br>Tahiryuak Lake<br>Kagloryuak River Valley<br>Cape Parry<br>Harrowby Bay<br>Lower Anderson River and Mason River<br>Kugaluk River<br>McKinley Bay - Phillips Island<br>Kukjutkuk and Hutchison Bays<br>Mackenzie River Delta<br>Amundsen Gulf and Cape Bathurst Polynya (marine)<br><br>These key sites are defined on the basis of supporting at least 1% of the Canadian population of one or more species of migratory bird for at least part of the year. EC has also identified key migratory bird terrestrial habitat sites along the Beaufort Sea coast in the Northwest Territories. | The Proponent identified the Lower Anderson River and Mason River, Kugaluk River, McKinley Bay - Phillips Island, and Kukjutkuk Bay and Hutchison Bay in the Project's Description of the Biophysical Environment. Although the majority of the proposed project activities will occur further away from the coast, the proponent should be aware of these key sites, specifically the Cape Bathurst Polynya and plan any project activities within or near these areas in a manner that avoids disturbance of birds. The Proponent should also add Harrowby Bay as a key terrestrial site within proximity to the proposed project.<br><br>EC recommends the Proponent include this additional information in any updated documents.<br><br>For further information on these Key Terrestrial and Marine Habitat Sites, refer to:<br><br>Mallory, M.L and A.J. Fontaine. 2004. Key marine habitat sites for migratory birds in Nunavut and the Northwest Territories. Canadian Wildlife Service Occasional Paper No. 109. Available on-line at http://publications.gc.ca/site/eng/392824/publication.html<br><br>Latour, P.B., J. Leger, J.E. Hines, M.L. Mallory, D.L. Mulders, H.G. Gilchrist, P.A. Smith and D.L. Dickson. 2008. Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut. 3rd edition. Canadian Wildlife Service Occasional Paper No. 114. Available on-line at: http://publications.gc.ca/site/eng/317630/publication.html |
| Migratory birds and Protected Areas within the Project Area<br><br>Overwintering of Vessels in the Regional Study Area<br><br>Spill Prevention | Section 6.7<br>Summary of the Proposed Development<br><br>6.7.1<br>Transit Routes | The Proponent states that if they decided to overwinter vessels in the Canadian sector of the Beaufort Sea there would be a contingency plan to use one or more sites in the region that have been used in the past, such as McKinley Bay, Summers Harbour or Wise Bay. The Proponent also states that they do not plan to overwinter vessels. | As noted in the above section, McKinley Bay is a Key Migratory Bird Habitat Site. EC recommends that the Proponent ensure that the project spill response plan include overwintering vessels and address the potential for fuel spills under the ice. More information should be provided regarding wildlife mitigation and monitoring during this potential activity. |

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| and Spill Contingency Planning | | | |
| Migratory birds and mitigation measures for vessel interactions | Section 14.2<br>Routine Activities | The Proponent states that the following mitigation measures will be implemented to minimize the potential for adverse effects on marine avifauna because of vessel presence and movements:<br>• Where permissible under safety and navigation requirements, outdoor lights will be shielded to minimize light spillage from vessels or angled to minimize direct illumination and reflection of the sea surface.<br>• Program vessels will maintain a minimum distance of 200 metres from nesting locations in accordance with best management practices for raptor conservation (Demarchi et al. 2005).<br><br>The Proponent also states that "Attraction to lighting has been recorded in pelagic birds such as albatross, petrels, and shearwater, but not the type of marine birds that have been documented in the LSA. Furthermore, there are no IBAs in the immediate vicinity of the LSA".<br><br>Literature cited:<br>Demarchi, M.W., M.D. Bentley, and L. Sopuck. 2005. Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia, MOE BMP Series (pp. 129). Prepared for: BC Ministry of Environment, Ecosystem Standards and Planning Biodiversity Branch. | Attraction to lighting and periods of reduced visibility are sources of bird collisions with vessel. EC notes the recent study by Merkel and Johansen (2001) who reported light-induced bird strikes in Common Eider and proposes several mitigation measures that could reduce the potential for bird collisions with vessels, including:<br><br>• Replacing traditional white light sources with bird-friendly green lights;<br>• Reducing and/or shielding light sources on dark nights, especially when there is reduced visibility from fog or snow;<br>• Switching lights off when they are not needed; and<br>• Shielding spotlights to the sky and sides<br><br>EC recommends that further information be provided regarding wildlife monitoring and mitigation for the vessel and vessel activity project component.<br><br>Literature cited:<br>Merkel, F.R. and Johansen, K.L. 2011. Light-induced bird strikes on vessels in Southwest Greenland. Marine Pollution Bulletin 62: 2330-2336. |
| Sea ducks | Section 10<br>Description of the Biophysical Environment<br><br>10.10<br>Marine Avifauna | The Project Area may encounter flocks of migrant eiders throughout the summer and fall until the end of October. King and Common eiders travel back through the Beaufort Sea on moult and fall migration throughout summer and fall. | EC recommends the Proponent consider potential mitigations that might be used if operations encounter large flocks of sea ducks that do not move out of the area during the ramp-up period and operations. EC provides the following reference to consult regarding habitat use by eiders in the Beaufort Sea:<br><br>Dickson, D.L. and Smith, P.A. 2013. Habitat Use by Common and King Eiders in Spring in the Southeast Beaufort Sea and Overlap and Resource Exploration. Journal of Wildlife Management 74(4): 777-790.<br><br>EC recommends the Proponent provide more information regarding wildlife monitoring and mitigation because of the |

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| | | | potential for significant population effects to eiders if there was a major spill even in spring. |
| Sea ducks<br><br>Spills and Spill Contingency Planning | Section 14.3<br>Analysis of Potential Significant Environmental Effects<br><br>14.3.6<br>Oil Spill Response Plan<br><br>14.3.8<br>Potential Environmental Effects of Accidental Spills | EC reminds the Proponent that Section 5.1 of the *Migratory Birds Convention Act, 1994* prohibits persons from depositing substances harmful to migratory birds in waters or areas frequented by migratory birds or in a place from which the substance may enter such waters or such an area. | Marine birds are vulnerable to oil spills and to pollution of their feeding areas. EC recommends that the proponent consider what steps would be taken to protect wildlife (including marine birds) in the event of a spill. This information could be incorporated into an emergency response and/or spill response plan. This could include specific measures to keep wildlife out of a contaminated area, equipment available to do this, what measures would be taken if animals do come in contact with the spill, and when such procedures should be used. Having this information outlined not only benefits wildlife, but also gives clear direction to the field crew on what to do in a spill situation if wildlife is nearby.<br><br>The Proponent states in Table 14-20: Effects, Mitigation and Significance - Major Spill, that mitigation measures include the reduction of surface slicks off shores with dispersants and burning and to protect sensitive coastal areas with selective booming. EC recommends that shoreline sensitivity mapping be completed and results incorporated into project spill contingency plans. EC also provides the following references to consult during the preparation of the project spill response plan and the wildlife mitigation and monitoring plan:<br><br>Lehoux, D. and D. Bordage. 2000. Deterrent Techniques and Bird Dispersal Approach for Oil Spills. Unpubl. Rept., Canadian Wildlife Service, Ste Foy, Quebec<br><br>U.S. Fish and Wildlife Service. 2002. Best Practices for Migratory Bird Care during Oil Spill Response. Unpubl. Rept. U.S Fish and Wildlife Service, Anchorage, Alaska.<br><br>Additionally, Marine birds (avifauna) are not listed in Table 14-19: Effects, Mitigation and Significance - Minor Spill. EC recommends that this table be updated to include this group. |
| Spill Response and Migratory Birds | Section 4.1.2 Regulatory Authorities<br>4.1.2.3<br>Environment Canada<br><br>14.3.6<br>Oil Spill Response Plan | In Subsection 4.1.2, the Proponent states the regulatory responsibilities of Environment Canada. EC would like to remind the proponent, that a permit is required from the Canadian Wildlife Service of Environment Canada for any handling of migratory birds.<br><br>In Subsection 14.3.7 the Proponent states that “When | When the Oil Spill Response Plan is written, EC recommends the Proponent develop a Wildlife Protection Plan as part of the overall plan, describing specific measures they will take to keep birds away from any oil contaminated area, including specifics regarding marine bird hazing. The Proponent should also ensure that anyone dealing with oiled birds has proper training in the handling and rehabilitation of oiled birds and specifics regarding marine bird |

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<td>14.3.7<br>Reducing Potential Effects</td>
<td>responding to a spill event, mitigation measures would include:<br>• using real-time wildlife monitoring and mitigation, as appropriate and practicable, to conduct such actions as:<br>  • using marine bird hazing to keep birds away from the spill area<br>  • practicing wildlife capture and release, including capturing and cleaning polar bears</td>
<td>hazing should be provided.</td>
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<td>Species at Risk</td>
<td>Section 10<br>Description of the Biophysical Environment<br><br>10.13 Summary of Protected Species in the Program Area</td>
<td>The following comments are pursuant to the Species at Risk Act (SARA), which came into full effect on June 1, 2004. Section 79 (2) of SARA, states that during an assessment of effects of a project, the adverse effects of the project on listed wildlife species and its critical habitat must be identified, that measures are taken to avoid or lessen those effects, and that the effects need to be monitored. This section applies to all species listed on Schedule 1 of SARA. However, as a matter of best practice, EC suggests that species on other Schedules of SARA and under consideration for listing on SARA, including those designated as at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), be considered during an environmental assessment in a similar manner. The Table below lists species that may be encountered in the project area and the regional study area that have been assessed by COSEWIC as well as their current listing on Schedule 1 of SARA (and designation if different from that of COSEWIC). Project impacts could include species disturbance and attraction to operations.
<table>
<tr><th>Terrestrial Species at Risk [1]</th><th>COSEWIC Designation</th><th>Schedule of SARA</th><th>Government Organization with Lead Management Responsibility [2]</th></tr>
<tr><td colspan="4">Project Area</td></tr>
<tr><td>Polar Bear</td><td>Special Concern</td><td>Schedule 1</td><td>Government of Nunavut (GNWT)</td></tr>
<tr><td>Ivory Gull</td><td>Endangered</td><td>Schedule 1</td><td>Environment Canada (EC)</td></tr>
<tr><td colspan="4">Regional Study Area (Inuvialuit Settlement Region)</td></tr>
<tr><td>Polar Bear</td><td>Special Concern</td><td>Schedule 1</td><td>GNWT</td></tr>
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</td>
<td>For any Species at Risk that could be encountered or affected by the project, EC recommends the Proponent note any potential adverse effects of the project to the species, its habitat, and/or its residence. All direct, indirect, and cumulative effects should be considered. Refer to species status reports and other information on the Species at Risk registry at http://www.sararegistry.gc.ca for information on specific species as well as the booklet “Species at Risk in the Northwest Territories” (2012 Edition) available at http://nwtspeciesatrisk.ca/pdf/SpeciesatriskintheNWT_English.pdf<br><br>If Species at Risk are encountered or affected, the primary mitigation measure should be avoidance. The proponent should avoid contact with or disturbance to each species, its habitat and/or its residence.<br><br>Monitoring should be undertaken by the proponent to determine the effectiveness of mitigation and/or identify where further mitigation is required. As a minimum, this monitoring should include recording the locations and dates of any observations of Species at Risk, behaviour or actions taken by the animals when project activities were encountered, and any actions taken by the proponent to avoid contact or disturbance to the species, its habitat, and/or its residence. This information should be submitted to the appropriate regulators and organizations with management responsibility for that species, as requested.<br><br>For species primarily managed by the Territorial Government, the Territorial Government should be consulted to identify other appropriate mitigation and/or monitoring measures to minimize effects to these species from the project.</td>
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| | | Grizzly Bear | Special Concern | Pending | GNWT | Mitigation and monitoring measures must be taken in a way that is consistent with applicable recovery strategies and action/management plans. |
| | | Peary Caribou | Endangered | Schedule 1 | GNWT | |
| | | Barren-ground Caribou (Dolphin and Union population) | Special Concern | Schedule 1 | GNWT | |
| | | Woodland Caribou (Boreal population) | Threatened | Schedule 1 | GNWT | |
| | | Wolverine (Western population) | Special Concern | Pending | GNWT | |
| | | Collared Pika | Special Concern | Pending | GNWT | |
| | | Hairy Braya | Endangered | Pending | GNWT | |
| | | Peregrine Falcon | Special Concern (*anatum-tundrius* complex[3]) | Schedule 1 | GNWT | |
| | | Short-eared Owl | Special Concern | Schedule 1 | GNWT | |
| | | Buff-breasted Sandpiper | Special Concern | Pending | EC | |
| | | Eskimo Curlew | Endangered | Schedule 1 | EC | |
| | | Red Knot (*islandica* subspecies) | Special Concern | Schedule 1 | EC | |
| | | Red Knot (*rufa* subspecies) | Endangered | Schedule 1 | EC | |
| | | Red Knot (*roselaari* subspecies) | Threatened | Schedule 1 | EC | |
| | | Horned Grebe (Western population) | Special Concern | Pending | EC | |
| | | Rusty Blackbird | Special Concern | Schedule 1 | EC | |

[1] The Department of Fisheries and Oceans has responsibility for aquatic species.

[2] Environment Canada has a national role to play in the conservation and recovery of Species at Risk in Canada, as well as responsibility for management of birds described in the Migratory Birds Convention Act (MBCA). Day-to-day management of terrestrial species not covered in the MBCA is the responsibility of the Territorial Government. Populations that exist in National Parks are also managed under the authority of the Parks Canada Agency

[3] The *anatum* and *tundrius* subspecies of Peregrine Falcon were reassessed by COSEWIC in 2007 and combined into one subpopulation complex. This subpopulation complex was assessed by COSEWIC as Special Concern, and was added to Schedule 1 of SARA in July 2012.

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| Species at Risk - Ivory Gull | Section 10<br>Description of the Biophysical Environment<br><br>10.13 Summary of Protected Species in the Program Area | Ivory Gulls are medium-sized gulls that can be identified by their pure white plumage and black legs. Ivory Gulls nest in colonies on windswept plateaus, ice-choked islands, or on steep cliffs of mountains protruding from glaciers. Although the proposed project is not near any known Ivory Gull nesting colonies, observations should be reported to the Canadian Wildlife Service of Environment Canada. | The Canadian Wildlife Service of EC is interested in observations of birds, especially observations of birds identified as Species at Risk (e.g., Ivory Gull) or of species occurring outside their known ranges. Proponents are encouraged to submit their observations to eBird Canada (http://ebird.org/content/canada).<br><br>Observations submitted to eBird are immediately available to anyone interested in birds in the north. Observations can also be sent to the NWT/NU Bird Checklist program:<br><br>NWT/NU Bird Checklist Survey<br>Canadian Wildlife Service, Environment Canada<br>5019 - 52 Street, 4th Floor<br>P.O. Box 2310<br>Yellowknife NT, X1A 2P7<br>Phone: 867.669.4771<br>Email: NWTChecklist@ec.gc.ca<br><br>Please contact the Canadian Wildlife Service for blank checklist forms. |
| Species at Risk - Eskimo Curlew | Section 10<br>Description of the Biophysical Environment<br><br>10.13 Summary of Protected Species in the Program Area | Eskimo Curlew is designated as Endangered and listed on Schedule 1 of the *Species at Risk Act*. The Regional Study Area of the project falls within the historical range of Eskimo Curlew. However, there have been no reliable sightings of Eskimo Curlew since 1998 and the National Recovery Team for this species has determined that recovery is not feasible at this time. It is EC's view that, in light of its current status, there is no need for further action with respect to Eskimo Curlew. | EC recommends an appropriate mitigation and monitoring plan be developed with the Proponent if it is established that this species does occur in the area. |
| Aircraft disturbance to migratory birds | Section 14<br>Analysis of Potential Significant Environmental Effect<br><br>14.2<br>Routine Activities<br><br>14.2.2<br>Aircraft Support<br><br>14.2.2.1.2 Marine Avifauna | In Subsection 14.2.2, the Proponent states that for drilling workforce rotations, two or more helicopters are expected to be chartered to make regularly scheduled transits between the Tuktoyaktuk airstrip and the drilling unit and icebreakers, averaging about one flight per day. Helicopters and fixed-wing aircraft might also be used for ice reconnaissance.<br><br>The Proponent states in Subsection 14.2.2.1.2 Marine Avifauna, that program aircraft operations will maintain travel at altitudes greater than 650 m whenever possible, program aircraft operators will be made aware of the location of sensitive birds areas along the flight path including nearby seabird colonies and will maintain altitudes above 1100m, pilots will be instructed to travel in a direct path to and from | In order to reduce aircraft disturbance to migratory birds, EC provides these additional recommendations, subject to pilot discretion regarding aircraft and human safety:<br>• If flights cannot be scheduled when few birds are present, plan flight paths that minimize flights over habitat likely to have birds and maintain a minimum flight altitude of 650 m (2100 feet).<br>• Minimize flights during periods when birds are particularly sensitive to disturbance such as migration, nesting, and moulting.<br>• Plan flight paths to avoid known concentrations of birds (e.g., bird colonies, moulting areas) by a lateral distance of at least 1.5 km. If avoidance is not possible, maintain a minimum flight altitude of 1100 m (3500 feet) over areas where birds are |

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<tr><td></td><td></td><td>their destination avoiding sensitive birds areas including local seabird colonies, and if aircraft are required to detour into the path of seabird colonies pilots will be instructed to avoid repeatedly flying over the same colony.</td><td>known to concentrate.<br>• Avoid the seaward side of seabird colonies and areas used by flocks of migrating waterfowl by 3 km.<br>• Avoid excessive hovering or circling over areas likely to have birds.</td></tr>
<tr><td>Species at Risk - Peary Caribou</td><td>Section 10<br>Description of the Biophysical Environment<br><br>10.12<br>Terrestrial<br>Wildlife<br><br>10.12.3<br>Peary Caribou</td><td>The Regional Study Area of this project is within the range of the Peary Caribou, which is a species listed as Endangered under the Species at Risk Act (SARA) and therefore requires special consideration with regard to effects on the species or its habitat. A recovery strategy is being developed in cooperation with the Northwest Territories and Nunavut communities that are within the range of the Peary Caribou. SARA requires that the Strategy identify Peary Caribou Critical Habitat. A process for identification of critical habitat is under way, in cooperation with technical experts – including Inuit communities. This process is not yet complete.</td><td>No associated recommendation - information for Proponent only.</td></tr>
<tr><td>Disturbance to nesting migratory birds</td><td>Section 5.4.2<br>Prevention and Mitigation of Non-Routine Activities<br>Table 5-3</td><td>The Proponent states that they will design and operate the shore-based facility to reduce effects on wildlife, marine seabirds and mammals, including effects related to nesting or denning sites.</td><td>EC would like to review the specifics that the Proponent will use to reduce effects on wildlife, and would expect details in a Wildlife Mitigation and Monitoring Plan. EC provides the following setback distances to be adopted within the Plan. These setback distances are recommended to minimize disturbance to nests for different bird groups nesting in tundra habitat (see footnotes for adjustments to setbacks for sensitive species and species at risk):<br><br>
<table>
<tr><th>Species Group</th><th>Pedestrians /ATVs (m)</th><th>Roads / Construction / Industrial Activities (m)</th></tr>
<tr><td>Songbirds</td><td>30</td><td>100</td></tr>
<tr><td>Shorebirds</td><td>50[a]</td><td>100[a]</td></tr>
<tr><td>Terns/Gulls</td><td>200[b]</td><td>300[b]</td></tr>
<tr><td>Ducks</td><td>100</td><td>150</td></tr>
<tr><td>Geese</td><td>300</td><td>500</td></tr>
<tr><td>Swans/Loons/ Cranes</td><td>500</td><td>750</td></tr>
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[a] If project activities are within the breeding ranges of American Golden Plover or Ruddy Turnstone, these setbacks should be increased to 150 m for Pedestrians/ATVs and 300 m for Roads/Construction/Industrial Activities respectively. If project activities are within the breeding ranges of Black-bellied Plover, Whimbrel or Red Knot (a Species at Risk), these setbacks should</td></tr>
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| | | | be increased to 300m for Pedestrians/ATVs and 500m for Roads/Construction/Industrial Activities. If field crew are trained in the identification of these species then these higher setbacks need only apply to these more sensitive species, and lower setbacks can be used for the remaining shorebird species. In areas where several species are nesting in proximity, setbacks for the most sensitive species should be used if they are present.<br>[b] If project activities are in proximity to breeding colonies of Ross's Gull (SAR) or Ivory Gull (SAR) these setbacks should be increased to 500m Pedestrians/ATVs and 750m for Roads/Construction/Industrial Activities. |
| Migratory birds and preventing attraction to operations. | Section 5.1.14<br>Shore-based Facility | In Subsection 5.1.14, the Proponent states that the offshore drilling program could require the support of a shore-based facility, most likely located in Tuktoyaktuk, which is about 125 km from the potential drilling location. | EC recommends that the Proponent should identify potential attractions of birds to project facilities for roosting and nesting birds and provide specifics of infrastructure design to limit wildlife attraction. |
| Migratory birds and preventing attraction to operations. | Section 16.3.5<br>Waste Management Plan | The Proponent states that the Waste Management Plan will describe the types of wastes that could be generated during drilling program activities and the means by which waste would be managed. | EC recommends that food, domestic wastes, and petroleum-based chemicals (e.g., greases, gasoline, glycol-based antifreeze) be made inaccessible to wildlife at all times. Such items can attract predators of migratory birds such as foxes, ravens, gulls, and bears. Although these animals may initially be attracted to the novel food sources, they often will also eat eggs and young birds in the area. These predators can have significant negative effects on the local bird populations. EC recommends that the Waste Management Plan discuss the prevention of wildlife attraction through proper waste management techniques. |
| Migratory birds and preventing attraction to operations. | Section 14.2.9.1 Potential Effects and Mitigation<br><br>14.2.9.1.2<br>Terrestrial Wildlife | The Proponent states that a Wildlife Interaction Plan will outline all processes and procedures to ensure human and bear safety and well-being. | EC recommends that the Wildlife Interaction Plan also include migratory birds and describe mitigation measures to reduce interactions and reduce the impact of interactions between project activities and migratory birds. |

# ENVIRONMENTAL EMERGENCIES SCIENCE TABLE

# (SCIENCE TABLE)

The Science Table is a new centrally delivered advisory mechanism that brings to bear EC's scientific expertise and abilities to identify environmental protection priorities.

During the response to an environmental emergency requiring multi-agency cooperation, the Environmental Emergencies Science Table (the "Science Table") can be convened to provide advice to the Lead Agency. The Science Table is not a spill response organization in the literal or traditional sense, namely, it does not involve hands-on spill clean-up operations, nor does it own or maintain clean-up equipment.

The Science Table brings together relevant experts in the field of environmental protection in the event of an environmental emergency response. The members of this Science Table can represent response agencies, all levels of government, Aboriginal representatives, local communities, industries, environmental non-government organizations, and academic institutions.

The Science Table of experts is able to develop consensus on protection and clean-up priorities, bring the right expertise, adapt the scale of response to a particular environmental emergency, and provide a forum for rapidly moving information to minimize damage to human life or health, or the environment while maximizing the use of limited response resources. These discussions can occur on-site, or by telephone or videoconference.

The Science Table supplies the Lead Agency, RP, and response organizations with consolidated scientific and technical advice on environmental concerns, priorities and strategies, thus enabling and optimizing the environmental response.

EC can chair the Science Table when asked by the Lead Agency and when at least one of following criteria is met:

- the environmental emergency is major in terms of impacts on the environment and/or complexity/severity
- the incident has an international or cross-jurisdictional component
- the need to coordinate information impedes the Lead Agency from fulfilling its response monitoring role.

The Science Table will generally include the following steps or procedures:

1. an incident/emergency is notified
2. the Lead Agency asks NEEC to activate and chair the Science Table
3. NEEC advises Science Table members with jurisdiction or vested interest in the environmental emergency
4. Science Table members could be involved in both on- and off-site response and information gathering

5. all information is garnered by on-site response and relevant agencies and reviewed by Science Table members; participating Science Table members have the opportunity to provide input for consideration in developing optimal response advice for the situation
6. the Science Table conducts a post-incident debrief.

The Science Table will operate under the following guiding principles:

- **Lead Agency Concept:** operates in support of the Lead Agency in providing consolidated, consensus-based environmental advice

- **One Window Approach:** each participating member is expected to appoint one representative to gather pertinent data from within their organization or interest group and present the consolidated concerns/comments to the entire Science Table

- **Team Concept:** partnerships and cooperation are critical to the success of the Science Table; each member has an equal voice and an equal opportunity for input in the decision-making process

- **Flexibility/Expandability:** all members that have jurisdiction or vested interest in environmental emergencies are encouraged to be part of the Science Table

- **Open Communication**: a free exchange of information between all members is encouraged; all interests, concerns and areas of dispute should be openly discussed, thereby providing opportunities for resolution

- **Provision of Consolidated Advice**: upon discussion, a consolidated set of priorities and advice is presented to the Lead Agency for consideration and implementation by the RP.