



# United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT

Alaska OCS Region

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JAN 14 2014

Susan Childs, Alaska Venture Support Manager  
Shell Gulf of Mexico, Inc.  
3601 C Street, Suite 1000  
Anchorage, Alaska 99503 - 5937

Dear Ms. Childs:

The Bureau of Ocean Energy Management (BOEM) has completed its review of the Shell Gulf of Mexico Inc. (Shell) Integrated Operations Plan (IOP), submitted on November 26, 2013, and Shell's Chukchi Sea Exploration Plan, Revision 2 (EP Rev 2) Request for Additional Information (RFAI) responses, submitted on December 20, 2013.

BOEM requests Shell clarify certain information submitted in the IOP, as well as in its responses to the RFAI. We have included comments and requests for clarifying information in the attached tables. BOEM has determined that the clarifying information is necessary to evaluate your proposed plan to ensure that it fulfills the requirements of 30 CFR 550, Subpart B and is sufficiently comprehensive.

If you have any questions, please contact William Ingersoll at 907-334-5224 or by email at [william.ingersoll@boem.gov](mailto:william.ingersoll@boem.gov).

Sincerely,

David Johnston, Regional Supervisor  
Office of Leasing and Plans

- Enclosure 1: Request for Additional Information - Operations
- Enclosure 2: Request for Additional Information - Environmental
- Enclosure 3: Request for Additional Information - Air Quality
- Enclosure 4: Request for Additional Information - Integrated Operations Plan

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
1	EP Rev. 2 Section 1.0	1-1	Provide information on any modifications that Shell performed to the <i>Noble Discoverer</i> to make it Arctic-ready, and provide documentation that Shell has addressed and corrected all non-compliance deficiencies cited by the U.S. Coast Guard and EPA following exploration drilling by the <i>Noble Discoverer</i> in 2012.	<p>BOEM will accept the U.S. Coast Guard (USCG) Certification of Compliance as demonstration of Shell's correction of the deficiencies cited by the USCG in 2012.</p> <p>U.S. Environmental Protection Agency (EPA) verified that it terminated Shell's Air Quality permit on December 26, 2013 (letter to Susan Childs from Kate Kelly, Director, EPA Office of Air, Waste, and Toxics). Accordingly, any Air Quality permit deficiencies cited by the EPA remain with the EPA.</p> <p>During our meeting December 13, 2013, BOEM clarified its expectation concerning the information it was seeking under RFAI No. 1. BOEM is seeking assurance from Shell that not only have the physical deficiencies been resolved, but also if Shell's management/oversight deficiencies that allowed the physical deficiencies to remain undetected or unresolved throughout the course of operations have been fixed. What adjustments or changes has Shell made to its project management/implementation/assurance plans to ensure that operational deficiencies, should they occur in the future, will be quickly detected and fixed?</p>
2	EP Rev. 2 Section 1.0	-	Provide confirmation of the completion of the third party management system review (as required by the 60-Day Report) or, if not yet complete, Shell's plans and schedule for completing the third party review.	BOEM received a copy of Shell's SEMS Audit Plan on January 7, 2014. The purpose of the plan is to define the audit program and procedures for the periodic audit of Shell Alaska Venture's Safety and Environmental Management System (SEMS) and the additional one time audit (i.e., 3rd Party Audit) required by DOI's 60-Day Report. Shell must complete the 3rd Party audit before recommencing drilling in the Chukchi Sea. Shell's submittal of the audit plan on January 7, 2014 and a copy of the audit report when the audit is complete will satisfy this RFAI item.
3	EP Rev. 2 Section 1.0	1-1	EP Rev 2 proposes adjusting the BOP test frequency from once every 7 days to once every 14 days. In its 2012 Chukchi Sea EP, Shell stated "[t]he blowout prevention program will be enhanced through ...increased frequency of BOP performance tests from 14 to 7 days, ..." Provide the rationale behind Shell's decision now to reduce the frequency of BOP tests to 14 days. Also, provide clarification for the doubling of the barrels of well fluids to be discharged because of BOP re-testing, if the BOP system is now proposed to be tested half as often (i.e., every 14 days as opposed to 7 days).	Shell indicated it would reduce BOP pressure testing frequency from every seven days to every 14 days, but would continue to conduct BOP function tests every 7 days. The pressure testing frequency is in alignment with BSEE regulations at 30 CFR 250.447. Shell will modify Section 12 of EP Revision 2 to include the explanation of doubling fluid discharge volumes; the inclusion of this explanation in EP Revision 2 will satisfy this RFAI item.

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
4	EP Rev. 2 Section 1.0	1-1	Correction: BOEM was enjoined from taking action on the May document. Once the injunction was lifted, Shell submitted its Revised draft EP, dated October 11, 2011.	Shell noted the comment and this RFAI item is satisfied.
5	EP Rev. 2 Section 1.0	1-7	The anchor radius of the Burger S well is projected to extend outside of lease block 6762 and would require a right of use easement per 30 CFR 550.160. This should be reflected within the EP narrative, within Table 1-1, and other applicable sections of the EP Rev 2.	Shell has agreed that it will apply for a right-of-use and easement authorization to place one or more anchors on the adjacent block lease when Shell submits an Application for Permit to Drill (APD) to BSEE. Shell's modifications to EP Revision 2, Section 1.0, will satisfy this RFAI item.
6	EP Rev. 2 Section 2.0	2-1	Permits and certifications associated with the relief drilling rig operations in the Chukchi Sea need to be identified in this table. Submittal of copies of the permits listed in this table would be helpful.	BOEM understands that the State of Alaska will require permits for mooring the <i>Polar Pioneer</i> in Dutch Harbor; Shell modification's of Table 2.a-1 by inclusion of permits and certifications (including local permits and certifications) will satisfy this RFAI item.
7	EP Rev. 2 Section 2.0 & Section 6.0	-	Provide clarification of the differences between volumes provided in Table 2.b-1 and the well specific tables within Section 6.0 regarding estimated discharge volumes once the riser is set. Provide example of calculations.	Shell stated it would add a clarifying footnote to EP Revision 2, Table 2.b-1 and add text to Tables 6.a-1 through 6.a-6 clarifying the drilling fluid and cuttings volumes for each planned well. Shell's response, with additional information and modifications to the EP Revision 2, will satisfy this RFAI item.
8	EP Rev. 2 Section 2.0	2-2	Provide information and documentation (i.e. certification and approvals) to verify that the well capping stack and containment system are ready and available for Arctic OCS conditions.	Certifications and/or approvals (USCG and BSEE) of the capping stack, containment dome, and associated vessels are needed before drilling may commence. Shell has agreed to provide copies of any such certifications and documents to BOEM. Shell's modification will satisfy this RFAI item.
9	EP Rev. 2 Section 2.0	2-2	For drilling a relief well, provide for the <i>Polar Pioneer</i> : <ul style="list-style-type: none"> <li>• mobilization time (supported by speed of towing vessel, distance, weather factors, time to anchor, etc.), and proposed drilling schedule;</li> <li>• notifications that Shell will issue before moving the <i>Polar Pioneer</i> ;</li> </ul> and <ul style="list-style-type: none"> <li>• assets (availability and logistics of support vessels/equipment) moving with the <i>Polar Pioneer</i> .</li> </ul>	Shell submitted a table that outlines the schedule for the <i>Polar Pioneer</i> and her support vessels to mobilize to the Burger Prospect and drill a relief well. This table shows 1 day for unmooring at Dutch, 7.5 days travel time from Dutch to Burger, 1.5 days for mooring at Burger, and 28 days to drill a relief well. Shell's inclusion of this table into EP Revision 2, Section 2.0 will satisfy this RFAI item.  The Regional Supervisor, Office of Leasing and Plans, will require Shell to notify BOEM if the <i>Polar Pioneer</i> is mobilized.

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
10	EP Rev. 2 Section 3.0	-	<p>The EP Rev 1 proprietary Section 3.0 was written prior to the drilling program in 2012. The drilling program at the Burger Site A included the excavation of a mudline cellar approximately 21 feet in diameter by 40 feet deep and drilling a pilot hole to approximately 1,500 feet below the sea level that was continuously logged while drilling. Shell interpreted the proprietary well log data, concluding that no permafrost is present in the subsurface at Burger Site A and that cooled muds would not be required when drilling to TD. These conclusions are asserted on pages 12-1 and xiv (App. E) in EP Rev 2, but the logs nor their analysis are not included. Provide an updated proprietary Section 3.0 with geological descriptions and associated data (specifically log data) obtained from the 2012 drilling field season, and Shell's analysis to support changes in the exploration drilling program.</p>	<p>To satisfy this RFAI item, BOEM requires the submission of the Logging While Drilling (LWD) logs, as well as an explanation of how Shell reached the conclusion that permafrost is not present based on these logs (pursuant to 30 CFR 550.214 and 30 CFR 550.227 (b)(i)) within EP Revision 2, Section 3.0.</p>
11	EP Rev. 2 Section 4.0	-	<p>Submit the recent H2S Contingency Plan that was submitted to BSEE on July 18, 2013. The revised H2S plan should be referenced in the EP Rev. 2 and changes are needed to Section 4.0 to reflect this new plan. Also, confirm that all emergency contact phone numbers are valid. Provide information on how any changes will be provided to relevant agencies.</p>	<p>Shell provided a copy of its most recently updated H2S plan. Shell must update EP Revision 2, Section 4.0, with these changes to satisfy this RFAI item.</p>
12	EP Rev. 2 Section 6.0	-	<p>Within Table 1-1 Shell has indicated that drilling fluids will not be cooled. Provide the rationale for the change, with supporting documentation, including any associated changes this will have on permitted actions and environmental impacts.</p>	<p>As stated previously, BOEM will require submittal of the LWD logs to support Shell's determination that permafrost or hydrates are absent, and that there is no reason to cool drilling fluids. To satisfy this RFAI item, Shell may modify EP Revision 2, Section 12.0, to note why Shell deems it unnecessary to cool drilling fluids; or this information may be included in EP Revision 2, Section 3.0, if Shell determines that it is proprietary.</p>
13	EP Rev. 2 Section 9.0	-	<p>The Well Control Plan in the EP Rev 1 included two topics that are not addressed in Appendix L, EP Rev 2, specifically: Blowout Well Ignition and Blowout Well Intervention. Identify and discuss any changes of assets and/or procedures to the referenced methods/practices for these two topics.</p>	<p>Shell responded with an explanation that those well control options (i.e., Blowout Well Ignition and Blowout Well Intervention) remain available even though they were not specifically addressed in the EP Revision 2, Appendix L. As these well control options remain available, BOEM requests that the options be included in EP Revision 2, Appendix L, to satisfy this RFAI item.</p>

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
14	EP Rev. 2 Section 10.0	10-1	Discuss the Hanna Shoal Walrus Use Area (HSWUA) and Shell's proposed mitigations, specifically for the months of June through September since Figure 13.e-1 and Figure 13.e-2 and identify operational/logistical activities (i.e. ice management, vessel, aircraft travel, etc.) within the HSWUA.	Shell responded that it will modify EP Revision 2, Section 10, regarding operations in the HSWUA. Shell is currently discussing the details of monitoring and mitigation measures with US Fish & Wildlife Service (USFWS). Shell will provide BOEM a copy of any Letter of Authorization (LOA) and any variances that it receives from USFWS. Shell's commitment to providing the LOA, with the additional information and modifications to EP Revision 2, Section 10.0, will satisfy this RFAI item.
15	EP Rev. 2 Section 11.0	11-1	Provide decision criteria for when a sound source verification of the drillship and support vessels would not be necessary.	Shell stated it will conduct sound source verifications (SSV) on vessels which did not have a SSV during the 2012 program. Shell will modify EP Revision 2, Section 11.0, to note Shell's plans regarding SSVs; Shell's modifications will satisfy this RFAI item.
16	EP Rev. 2 Section 12.0	12-1	Provide performance and capability information (i.e., drill unit specifications) for the <i>Polar Pioneer</i> . BOEM expects information similar to what is provided for the primary drilling unit within EP Rev 1. At minimum, include: station keeping capabilities; drilling capabilities; and, Arctic-readiness modifications and capabilities. Also revise Table 2.a-1 to include any permits or certifications associated with the <i>Polar Pioneer</i> 's ability to operate in the Chukchi Sea under Alaska OCS conditions.	Shell submitted specifications for the <i>Polar Pioneer</i> . BOEM requests that Shell include this information in EP Revision 2, Section 12.0, to satisfy this RFAI item.  BOEM will require a copy of the U.S. Coast Guard (USCG) Certification of Compliance for the <i>Polar Pioneer</i> when available.
17	EP Rev. 2 Section 13.0	13-1	Identify and incorporate the relief drilling rig and support vessel(s) within this section.	Shell's IOP identifies <i>Polar Pioneer</i> as a support vessel (Table 1), in accordance with 30 CFR 550.220. Shell has linked the <i>Polar Pioneer</i> to the emergency plan, and therefore by extension, the <i>Polar Pioneer</i> supports the overall operation. BOEM requires that EP Revision 2, Table 13.a-1, be modified to include the information to satisfy this RFAI item.

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
18	EP Rev. 2 Section 13.0	13-1	<p>Provide a description of how the assets in Section 13-1 are designed and built or modified for the Alaska OCS Conditions (i.e., extreme cold, freezing spray, snow, extended periods of low light, strong winds, dense fog, sea ice, strong currents, and dangerous sea states). Explain how Shell will manage all assets within the EP drilling program. The explanation must address:</p> <ul style="list-style-type: none"> <li>• how contractor safety practices are aligned with Shell safety principles and standards;</li> <li>• documentation of your integrated risk management approach for contractor management and oversight from mobilization through to demobilization;</li> <li>• a schedule of your exploration program, including contractor work on critical components, and plans to tailor your management and oversight programs to Alaska OCS Conditions;</li> <li>• documentation of Health, Safety, Security, and Environmental (HSSE) elements and risk management capabilities tailored for the risks and challenges of operating in the Alaska OCS;</li> <li>• documentation about how vessels and equipment will be (or have been) designed, built, and/or modified to handle the Alaska OCS Conditions;</li> <li>• drilling program objectives and timelines for each objective, including contingency plans for temporary abandonment of its well(s);</li> <li>• documentation of mobilization and demobilization operations, including tow plans applicable within Alaska OCS Conditions, as well as anticipated maintenance plans;</li> <li>• documentation of any resource sharing agreements for assets or mutual aid in the event of an emergency;</li> <li>• information regarding Shell's preparation and plans for staging spill response and cleanup assets;</li> <li>• weather and ice forecasting capability for all phase of the exploration program, including transportation to and from the Alaska OCS, and plan for managing ice hazards and responding to extreme weather events;</li> <li>• accountability and auditing of the implementation of plans and oversight of contractors; and, benchmarks for determining successful implementation.</li> </ul> <p>If Shell believes all or some of this information is included in the Integrated Operations Plan, submitted November 26, Shell may respond by citing the IOP page number referencing the responsive information.</p>	<p>Shell clarified or provided additional information in their responses and referenced useful information and page numbers within the IOP. See Items 1 - 14 in the <i>RFAI - IOP</i> for comments and requests pertaining to this RFAI item.</p>

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
19	EP Rev. 2 Section 13.0	13-1 &13- 2	The following vessels are identified as available when needed: an ice management vessel, <i>M/V Nordica</i> ; an anchor handling vessel, <i>M/V Aiviq</i> ; a resupply tug and barge, such as <i>M/V Lauren Foss</i> and/or <i>Tuuq</i> ; an additional tug, similar to the <i>M/V Ocean Wave</i> ; a science research vessel; an additional third offshore supply vessel; and an oil storage tanker, <i>Affinity</i> . Some of these vessels were listed in the Shell Camden Bay Exploration Plan. To ensure that the Chukchi Sea EP Rev 2 will be a stand-alone document, provide the same detail for each of these vessels as was provided for the Camden Bay EP: information where the support vessels are to be stationed when they are not in direct support of the drilling activities; and provide clarification of when and how these assets will be utilized and managed on a daily basis.	Shell provided clarification regarding the named vessels and how they are referred in EP Revision 2, Table 13.a-1; Shell's modification to include this information in EP Revision 2, Section 13.0, will satisfy this RFAI item.
20	EP Rev. 2 Section 13.0	13-1	The <i>Aiviq</i> suffered four engine failures during the towing of the <i>Kulluk</i> in 2012. Provide information about the cause of the failure of the four engines on the <i>Aiviq</i> in 2012 and what steps or procedures has Shell adopted to prevent a reoccurrence.	BOEM will accept the USCG Certification of Inspection as demonstration of Shell's resolution of any issues associated with <i>Aiviq</i> in 2012. BOEM, however, still requires information about what steps or procedures Shell has adopted to ensure that similar problems will not be repeated in the future. Shell's response to Operation Item # 1 concerning changes Shell has made, or plans to make, to its project management/implementation/assurance plans will likely satisfy this RFAI item.
21	EP Rev. 2 Section 13.0	13-2	Provide additional information and clarification of assets and activities associated with the Goodhope Bay in Kotzebue Sound. Clarify what operational activities are planned; and if there will be any on-shore based activities/facilities associated with exploration drilling activities.	Shell responded with information describing limited support operations at Goodhope Bay in Kotzebue Sound. Shell's modifications to the EP Revision 2, Section 13.0, to reflect support operations in Goodhope Bay, will satisfy this RFAI item.
22	EP Rev. 2 Section 13.0	13-2	Provide more information on activities (staging, fueling, duration, etc.) associated with landing craft operations.	Shell's responded with additional information regarding planned landing craft activities. Shell's modifications to EP Revision 2, Section 13.0, to include this information will satisfy this RFAI item.
23	EP Rev. 2 Section 14.0	14-1	Shell proposes to increase its man camp capacity in Barrow from 75 beds to approximately 200 beds. Provide the information required by 30 CFR 550.225(a)(2); as well as any changes in existing permits that will be required for the expansion and operations of the camp. Any changes in permits and/or authorization should also be identified within Table 2.a-1; and identified and discussed within other applicable sections of EP Rev 2.	Shell has substantially modified the plans originally provided in EP Revision 2. Shell responded with information detailing the new plans for the Barrow man camp and the leasing of certain facilities. Shell's modifications to the EP Revision 2, Section 14.0, will satisfy this RFAI item.
24	EP Rev. 2 Appendix A	Rev 1	With changes to proposed anchor radii, updated OCS Plan Information forms should be submitted with the EP Rev 2 (see section of form entitled "Anchor Locations for Drilling Rig or Construction Barge").	Shell provided revised <i>OCS Plan Information</i> forms for proposed wells and has replaced Lambert X-Y coordinates with Universal Transverse Mercator (UTM) coordinates for each well's location. Shell's inclusion of these forms in EP Revision 2, Appendix A, will satisfy this RFAI item.

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
25	EP Rev. 2 Appendix L	-	<p>Provide specifics regarding blowout well ignition and blowout well intervention. BOEM expects that safety principles and standards; accountability for implementations and auditing; and, benchmarks for determining successful implementation, etc. will be fully incorporated into the discussions regarding:</p> <ul style="list-style-type: none"> <li>• the schedule of blowout well intervention (including contractor work on critical program components);</li> <li>• discrete and amalgamated timeline(s);</li> <li>• descriptions of mobilization and demobilization operations;</li> <li>• general maintenance schedule for vessels and equipment;</li> <li>• description of the primary and secondary (if applicable) mission and corresponding work designated for each vessel (including all contracted operations and contractors).</li> </ul>	<p>Shell provided a table listing a schedule for drilling a relief well. Shell addressed additional aspects of the well control plan within the response to Operations Item # 13. Shell's modifications to the EP Revision 2, Appendix L, to include a schedule for drilling a relief well will satisfy this RFAI item.</p>



Topic	Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
EFH	1	EP Rev. 2 EIA: Fish and EFH	4-5	Seafloor Disturbance is addressed for the drilling sites in the EIA, Table 4.5-4. Provide similar information (e.g. the number of anchors, the surface area disturbed per anchor, the volume displaced per anchor, and the total seafloor area disturbed) for vessels moored in Kotzebue Sound-- Opilio crab EFH will now be part of the analysis.	Shell indicated that the impacts to the Opilio crab EFH will be negligible given that the impacts would be temporary and would be limited to a very small portion of the Opilio crab EFH in the Chukchi Sea. Shell's modifications to EP Revision 2, Environmental Impact Analysis, Sections 4.1.5 and 4.1.6 with these tables and explanations will satisfy this RFAI item.
Sociocultural /Subsistence	1	EP Rev. 2 EIA: Section 2.3	2-9	Provide full details regarding man-camps in Barrow and Wainwright. Provide maps and a detailed description to fully address the expansion (and new location) of the man camp from 75 to 200 persons in Barrow, to include precise location of the camp and changes in footprint to accommodate expansion. Also, describe the disposal of wastes (wastewater and solid waste handling) in terms of amounts and methods of disposal (impacts on NSB services) and provide associated permits.	Shell indicated that it plans to expand its existing man camp, add a kitchen/dining/recreational area, lease additional accommodations, complete a hanger expansion and repairs, and possibly rent additional rooms for its employees as necessary. Shell's modifications EP Revision 2, Environmental Impact Analysis, Section 2.3, with these tables and additional information will satisfy this RFAI item.
Sociocultural /Subsistence	2	EP Rev. 2 Section 5.0 (c)	5-1	Provide the most recent UMIAQ reports: UMIAQ 2012 and UMIAQ 2013.	The provided UMIAQ 2012 and UMIAQ 2013 reports satisfy this RFAI item.
Sociocultural /Subsistence	3	EP Rev. 2 EIA: 4.1.12 and 4.1.13	4-26	Provide detailed information regarding numbers of transits, crew changes, and estimated treated sanitary waste quantities to be discharged from vessels.	Shell indicated that crew changes by vessel will only be necessary during contingency events, it cannot estimate the frequency or number of such vessel trips. This response satisfies this RFAI item.
Sociocultural /Subsistence	4	EP Rev. 2 EIA	4-30	Provide SA Beluga Whale harvest reports for the communities of Wainwright and Point Lay through 2012.	Shell indicated that a table will be added to the EP Revision 2, Environmental Impact Analysis, Section 4, that provides annual beluga harvests for Barrow, Wainwright, Point Lay, and Point Hope for 1990-2012; however the harvest data are from the Alaska Beluga Whale Committee instead of Shell's subsistence advisors. Shell's modifications to EP Revision 2, Environmental Impact Analysis, Section 4.0, with this additional table will satisfy this RFAI item.
Sociocultural /Subsistence	5	EP Rev. 2 Section 2.0	2-1	Provide a map showing the locations of the maximum pollutant concentrations occurring offshore within the subsistence areas.	Shell provided figures and tables illustrating the maximum pollutant concentrations occurring offshore within the subsistence areas. Shell's modifications to include these additional tables and figures in EP Revision 2, Section 2.0 will satisfy this RFAI item.

Topic	Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
Archaeology	1	EP Rev. 2 Section 13.0 (a)	13-2	Provide full details regarding the staging of near shore tug and barge in Goodhope Bay: precise location, moorings, depth, distance from shore, any other seabed disturbance, discharges, staffing, etc. If the seabed will be disturbed, provide an archaeological report or information sufficient for BOEM to determine that no historic properties will be affected.	Shell provided a technical memorandum on the archaeological resources of the mooring area. Shell's modifications to EP Revision 2, Section 13.0, and Environmental Impact Analysis, Section 2.1 and Section 4.1.12, to include additional mooring information will satisfy this RFAI item.
Archaeology	2	EP Rev. 2 EIA: Section 4.3.2	4-47	Provide an archaeological report on the proposed camp in Barrow or information sufficient for BOEM to ensure that no historic properties will be affected.	Shell indicated that a new section, EP Revision 2, Environmental Impact Analysis, Section 4.3.3 Impact of Shorebase Increases on Cultural Resources and Historic Properties, will be added to provide additional information and analyses describing how Shell's camp should not affect the historic integrity of the NARL Historic District. This additional information and modifications to EP Revision 2 will satisfy this RFAI item.
Birds	1	EP Rev. 2 EIA: Preface	xviii	Provide report in electronic format: "Distribution and abundance of seabirds in the northeastern Chukchi Sea, 2008 – 2012" (Gall and Day 2013).	Shell provided <i>Distribution and abundance of seabirds in the northeastern Chukchi Sea, 2008 – 2012</i> (Gall, Day, and Morgan 2013) report. This RFAI item is satisfied.
Birds	2	EP Rev. 2 Appendix I	i	Provide a description of the measures Shell took, or will take, to satisfy the conditions of Lease Stipulation 7 regarding bird collisions for the <i>Polar Pioneer</i> .	BOEM concurs with Shell that Lease Stipulation 7 does not apply to the <i>Polar Pioneer</i> when it is moored in Dutch Harbor; however, BOEM requests verification that the <i>Polar Pioneer</i> is prepared to comply with Lighting Protocols required in Lease Stipulation 7, in case it is necessary for the vessel to move northward.
Birds	3	EP Rev. 2 Section 13.0	13-1	Provide IHA and LOA applications.	To satisfy this RFAI item, confirm whether or not Shell's contractor will be entering the Ledyard Bay Critical Habitat Unit (LBCHU). Figure 8 in the Marine Mammal Monitoring and Mitigation Plan submitted with Shell's IHA Application appears to indicate that the acoustic recorders previously deployed in the LBCHU have been removed.  If Shell's contractor will be entering the LBCHU, please confirm that Shell will continue to follow the conditions specified in the July 25, 2013 letter from David Johnston (BOEM) to Susan Childs (Shell) regarding Shell's request for approval to deploy and recover acoustic recorders within the LBCHU.
Birds	4	EP Rev. 2 Attachment A	A-3	Correct the title to remove the parenthetical "(Stipulation Area)." Stipulation 7 applies to the Chukchi Sea, not only to the listed blocks.	Shell indicated that it has removed the language (Stipulation Area) from the title within the modified EP Revision 2; the modification will satisfy this RFAI item.

Topic	Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
Oil Spills	1	EP Rev. 2 Section 13.0	13-2	<p>Provide information regarding whether fuel transfers will occur within Kotzebue Sound/Goodhope Bay for tugs, capping stack barge, or near shore barge. If fuel transfers will occur provide the following:</p> <p>(1) how many times might refueling occur during the season of operation;</p> <p>(2) an estimate of fuel spill volume (if a hose ruptures, for example);</p> <p>(3) type of fuel that would be transferred;</p> <p>(4) minimum distance to shoreline;</p> <p>(5) verification that the “Shell Fuel Transfer Plan” is in effect and applicable to these operations; and</p> <p>(6) any mitigation measures in place to address fuel transfer spills, if they occur.</p>	<p>Shell provided information regarding the refueling of the <i>Arctic Challenger</i> and <i>CORBIN FOSS</i> in Kotzebue Sound/Goodhope Bay. Shell's modification to include this information within EP Revision 2, Section 13.0, will satisfy this RFAI item.</p>
General	1	EP Rev. 2 Section 5.6	23	<p>Clarify “as-yet undefined ports” and the vessels that will be using these ports.</p>	<p>Shell indicated that vessel staging and anchor locations outside the area used for the NEPA air quality analysis include Dutch Harbor and Kotzebue Sound/Goodhope Bay. Shell's modification to include this information in EP Revision 2, Appendix O, Section 5.6, will satisfy this RFAI item.</p>
General	2	EP Rev. 2 Table 6.c-2	6-5	<p>Provide an explanation for the inclusion of the additive “biocide” in the drilling fluid components. What are its effects to wildlife and how long does it remain active? If this material is to be released into the ocean, provide detailed information about its potential effects.</p>	<p>Shell elaborated that the EPA (2008) has concluded that the biocide is practically non-toxic to birds, slightly to moderately toxic to laboratory mammals, and practically non-toxic to moderately toxic to marine species (fish and invertebrates); and provided additional information and analyses of how this biocide will be utilized within their drilling program. Shell's modification to EP Revision 2, Section 6, Environmental Impact Analysis, Section 2.4 and Environmental Impact Analysis, Tables 2.4-1 and 2.4-2 to include additional information will satisfy this RFAI item.</p>

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
1	EP Rev. 2, Appendix O	N/A	Active spreadsheets that were used for the calculations to allow verification of data provided in Appendix O—include each emission unit by make and model. The spreadsheets must not contain any locked cells, hidden rows or columns or text (i.e. white text on a white background), and the workbooks and spreadsheets must not be password protected, unless the password is provided to the Regional Supervisor.	Provide the updated spreadsheet with the changes requested under Air Quality Items #22, #23, and #25 to satisfy this RFAI item.
2	EP Rev. 2, Appendix O	N/A	Documentation or clarification concerning the capacity of the 3512C generator sets. Shell states that the generation units on the Noble Discoverer are Caterpillar 3512C generator sets. Shell lists the capacity of the 6 Caterpillar 3512C generators at 6000KW (Attachment A, Appendix O). Caterpillar's specification for the 3512C generator shows a minimum rating of 1250 ekW and a maximum rating of 1500 ekW.	Shell's response satisfies this RFAI item.
3	EP Rev. 2, Appendix O, Section 5.4	N/A	Documentation concerning the estimated control efficiency of 50% per pollutant (Section 5.5, Appendix O).	<p>Shell's response does not satisfy this RFAI item - insufficient documentation provided.</p> <p>The RFAI response references the "April 2012 table of preliminary results" from source testing the Caterpillar 3512C engine equipped with the same SCR and CDPF controls installed on the <i>Discoverer</i>. Provide the data of preliminary results as a computer spreadsheet for BOEM review of the methods and calculations. Explain why the results of source testing, which are used in the air quality analysis, are preliminary results and why the final results are not used.</p> <p>Shell's EP Revision 2 stated that the AQRP emission inventory would not reflect emission reduction controls, such as SCR and CDPF. Verify that the controls that allow a 50% reduction in emissions, or any measures to reduce emissions, are not used in the calculation of the emission inventory prepared for comparison to the emission exemption thresholds as required under 30 CFR 550.303(d), the Air Quality Regulatory Program (AQRP).</p>

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
4	EP Rev. 2, Appendix O, Section 2.0	N/A	Information describing what constitutes “good engine operating practices” to lower emissions by reducing all diesel engine load factors by 20% in Section 2.0 of Appendix O.	<p>Shell's response does not satisfy this RFAI item.</p> <p>The explanation provided in response to the RFAI states that "good engine operating practices" of limiting the diesel engines by imposing a 20% reduction in power is necessary for marine engines that are "built into the hull and cannot be economically replaced in total." This is contrary to BOEM's understanding that the power reduction is applied because of "standard industry practice" for good maintenance and efficient operation of diesel engines. Shell's explanation implies that non-road diesel engines at power plants, which Shell uses as an example, would not require this operational limitation for efficient operation. Provide the vendor information recommending 80% maximum power for all diesel engines as good operating practice.</p> <p>Further, the response references documentation that exists in the form of a letter from Ms. Susan Childs to EPA's Natasha Greaves on January 11, 2011, which requests concurrence with the practice of reducing engine power by 20%. Provide EPA's response from Ms. Greaves.</p>
5	EP Rev. 2, Appendix O	N/A	Documentation of MARPOL Annex VI compliance for each engine claiming the lower MARPOL emissions standards. Documentation of EPA marine engine tier standards for each engine claiming the lower EPA emissions standards. Using emission factors simply described as “a mixture of other generic emission factors” is not sufficient.	<p>Shell's response does not satisfy this RFAI item.</p> <p>The source of emission factors listed in the RFAI response includes Marine Category 1-Tier 2 emission factors obtained from 40 CFR 98.4, Table A-1. To confirm use of the proper emission factors from Table A-1, Shell must provide the model year and engine size (displacement) that corresponds to the emission factors used in the calculation of emissions.</p> <p>Within the spreadsheet provided in response to Air Quality Item #1, the generator sets have emission factors, such as 1.3 g/kW-hr for CO, which cannot be traced to any published table or list. Shell's Table 1 provides a summary of sources from which emission factors were obtained. However, the <i>Discoverer</i> generator sets are not listed within Table 1. Provide the emissions factors and source references, and include them within modified Table 1.</p> <p>In addition, when Tier emission factors are used for NOx or for VOC, where the published emission factors provide one value for "NOx+VOC," explain how the proportional emission factors were calculated separately for NOx and VOC emissions.</p>
6	Ep Rev. 2, Appendix O, Section 5.2	N/A	Documentation of the “safety policy” referenced in Table 6 of Section 5.2 of Appendix O to reduce engine power level by 50%.	Shell's modification to include this information within EP Revision 2, Appendix O will satisfy this RFAI item.

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
7	EP Rev. 2, Appendix O, Section 5.2	N/A	Documentation or other supporting justification that short-term use limitations in equations (1) through (6) in Section 5.2 of Appendix O are established practices.	Shell's modification to include this information within EP Revision 2, Appendix O will satisfy this RFAI item.
8	EP Rev. 2, Appendix O, Section 5.2	N/A	Documentation or clarification for using the 15% power to lift the drill stem in equations (6) through (15) in Section 5.2 of Appendix O.	Shell's modification to include this information within EP Revision 2, Appendix O will satisfy this RFAI item.
9	EP Rev. 2, Appendix O, Section 5.1	N/A	Clarification of the column heading "Aggregate Nameplate Rating" and justification of the method used to aggregate the rating in Table 2-4 of Section 5.1 of Appendix O.	Shell's modification to include this information within EP Revision 2, Appendix O will satisfy this RFAI item.
10	EP Rev. 2, Appendix O, Section 5.1	N/A	Clarification of the column heading "policy limits on emissions units/group" in Table 5 of Section 5.1 of Appendix O.	Shell must modify Table 5 within EP Revision 2, Appendix O, Section 5.1 to satisfy this RFAI item.
11	EP Rev. 2, Appendix O	N/A	Documentation that propulsion engine emissions were used in the projected emissions inventory for purposes of 30 CFR 550.303(d).	Shell's response satisfies this RFAI item.
				<p>Shell's response does not satisfy this RFAI item.</p> <p>The RFAI response states that Table 7 in Appendix O provides a line item, "Project Duration Total," to represent the total emissions multiplied by 3, as the revised EP is a multi-year plan. The emission inventory presented in Table 7 is the inventory used to compare to the emission exemption thresholds as required under 30 CFR part 550 subpart C. Thus, pursuant to 30 CFR 550.303(d), which requires use of the "highest annual total amount of emissions from the facility," and pursuant to 30 CFR 550.218 (a)(1)(iii), either clarify that the inventory provided is the highest annual inventory of the three seasons, and thus the "Project Duration Total" is worst-case scenario, or provide all three annual projected emission tables and the total over the duration of the proposed exploration activities.</p>

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
12	EP Rev. 2, Appendix O, Section 5.5	N/A	Clarification of the row heading "Project Duration Total" in Table 7 of Section 5.5 of Appendix O, and an explanation of the values under this heading.	For the revised Table 7, provide the inventory in a simple computer spreadsheet table showing the calculations of emissions by source aboard the facility only, the maximum engine rating of each source, if applicable, the operational limitation applied to the maximum engine rating, if applicable, the hours of use for each source, and the emission factors used, along with documentation of the source of the emission factors. Emission factors should be obtained from the final results of source testing; manufacturer data; a published source (non-road diesel Tier factors or marine engine Tier factors); or AP-42 tables. Include a column in the table that totals the emissions by pollutant and by source, as appropriate. Include projected emissions of NOx, SO2, VOC, CO, PM10 and PM2.5. Do not combine PM10 and PM2.5 emissions under a heading of "particulate matter." Provide all three seasonal inventories and a total of emissions over the duration of the three seasons; or provide the highest annual emission inventory and multiply the total by three, and state definitively that the one emission inventory provided is the highest annual emission inventory.
13	EP Rev. 2, Appendix O, Section 4.10.3	N/A	Data or other information to clarify the characterizations of emissions from equipment and surface vehicles for construction as "minor" and "small" in Section 4.10.3 of Appendix O.	<p>Shell's response does not satisfy this RFAI item.</p> <p>The response to this RFAI does not clarify how the emissions from construction constitutes the characterization of construction emissions as "minor" and "small" in the EP Revision 2.</p> <p>While the RFAI response claims minimal fugitive dust due to transport over frozen ground, there is no accounting for the emissions of the criteria pollutants from operating the construction equipment, particularly the 15-20 truckloads hauling gravel, emissions from vehicles used to relocate the 40-person camp, and expansion of the passenger processing facility.</p> <p>Provide the inventory of emissions resulting from the use of equipment expected to accomplish the construction described in the EP Revision 2 in the same manner and form described under Air Quality Item #12.</p>
14	EP Rev. 2, EIA, Appendix C	N/A	Diagrams, figures, and text missing from Appendix C of the EIA.	Shell's modification to include this information within EP Revision 2, Environmental Impact Analysis, Appendix C will satisfy this RFAI item.

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
15	Appendix O	N/A	Provide documentation that aggregate or averaged methods are not applied to nonlinear functions.	Shell's response satisfies this RFAI item.
16	Appendix O	N/A	Provide a map showing the locations of the maximum pollutant concentrations occurring onshore.	Shell's modification to include these maps and information within EP Revision 2, Appendix O, will satisfy this RFAI item. However, see Air Quality Item #27.
17	Appendix O	Tables 7, 8 and 9	N/A	Pursuant to 30 CFR 550.218(a), ensure the data reported in Tables 7, 8, and 9 will be provided when the revised Appendix O is updated to reflect the data provided on the revised EXCEL workbook dated 12/20/2013. In the tables, provide projected emissions of particulate matter in the form of PM10 and PM2.5; do not combine PM10 and PM2.5 as "particulate matter" as shown in Table 7 of Appendix O.
18	Appendix O	Table 8	N/A	While projected maximum hourly (short-term) emissions are provided in Table 8 of Appendix O, provide confirmation that these are peak hourly rates when all years of operations have been considered for the multi-year plan.  Pursuant to 30 CFR 550.218 (a)(1)(i), provide an explanation of how the peak hour rates are calculated and provide the results in a simple table, together with the supporting computer spreadsheet similar to that described in Air Quality Item #12.
19	Appendix O	Table 7	N/A	Data in Table 7 of Appendix O is provided only as "seasonal" values. The AQRP requires an inventory of the highest annual total amount of emissions for a multi-year plan.  Pursuant to 30 CFR 550.218 (a)(1)(ii) and 30 CFR 550.303(d), provide data for each season for the multi-year plan or confirm that the information provided in the revised Table 7 represents the highest value for any season, and not an average. If one particular year of activities shows a higher rate of emissions, provide and explain the assumptions upon which the inventory is based and why one year's emissions might be higher than another.
20	Appendix O	N/A	N/A	An annual emission inventory for the AQRP was provided only for "a" season. Pursuant to 30 CFR 550.218 (a)(1)(iv) and 30 CFR 550.303(d), either provide data for each season, or confirm that information that will be provided in EP Revision 2 will represent the highest value of annual emissions for any season.



Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
21	Appendix O	N/A	N/A	Pursuant to 30 CFR 550.218 (a)(1)(v), providing data requested above in Air Quality Items #17 - #20 will satisfy this requirement.
22	Appendix O	N/A	N/A	<p>To fully comply with 30 CFR 550.218 (a)(2):</p> <ul style="list-style-type: none"> <li>• Provide a copy of the email that is referenced to support the SO2 emissions factor (Tesoro Nikiski, Email Royal Harris 4/20/11).</li> <li>• Verify the diesel density of 7.00 lb/gal is valid for ULSD fuel Shell intends to purchase.</li> <li>• Verify and document use of 100 ppm S for the SO2 emission factor for combustion sources by providing the Material Safety Data Sheet (MSDS) for the fuel Shell intends to purchase.</li> </ul>
23	Appendix O	N/A	N/A	Refer to Air Quality Item #1 above. Data provided in the RFAI Response computer workbook, spreadsheet [Discoverer Engines], is insufficient for “seldom used” engines. Pursuant to 30 CFR 550.224(b), provide the actual engine type, with maximum rating capacity expected for use, or provide a reasonable substitute citing the engine type. Providing documentation of “no spec sheet” and “Sabb” is not sufficient documentation.
24	Appendix O	N/A	N/A	Pursuant to 30 CFR 550.227(a)(3) and (b)(2), providing the data requested above in Air Quality Items #6 - #23, and Air Quality Items #26 - #27 will satisfy this requirement.
25	Appendix O	N/A	N/A	<p>Refer to Air Quality Item #1. The emission exemption threshold formulas are applied incorrectly:</p> <ul style="list-style-type: none"> <li>• Rule specifically requires formula of <math>E=33.3D</math> for most of the criteria pollutants, including VOC, and the formula of <math>E=3400(Dexp2/3)</math> for CO. E is defined as the calculated emissions threshold and D is the distance from shore to the proposed facility. Providing a formula of <math>D=E/33.3</math>, where E represents projected annual emissions, and D is some other distance is incorrect.</li> <li>• Provide solutions to the exemption threshold calculations using emissions from the facility (i.e. drillship) only and provide solutions for each pollutant, as applicable.</li> <li>• Use the highest projected annual emissions for the multi-year plan for these calculations.</li> </ul>

Item	Document Section	Page	Request/Comment [11/26/2013]	Request/Comment [01/14/2014]
26	Appendix O	N/A	N/A	Explain the basis for the use of surface roughness of 0.025 in computer modeling of the emission inventory.
27	Appendix O	N/A	N/A	Explain why dispersion of the emissions from the facility shows impacts (refer to the isopleth plots) on the shoreline along a line of transport from the northwest, given that the windrose shows prevailing winds from the northeast; or provide the contours of the entire grid so the pollutant transport can be readily understood.
28	Appendix O	N/A	N/A	The spreadsheet provided in response to Air Quality Item #1 is difficult to interpret and verification of the data is problematic. BOEM requests that all emission inventory tables submitted to satisfy 30 CFR 550, Subpart C and the informational requirements of 30 CFR 550.218, .224, and .227, be provided as described in Air Quality Item #12.

Item	Document Section	Page	Request/Comment [01/14/2014]
1	IOP Introduction	1	Since Shell relies primary on contractors to meet its 2014 objectives, the IOP must clearly detail how Shell conducts contractor oversight to ensure that its safety and environmental protection policies and standards are implemented by its contractors.
2	IOP 1.1	5, 6	The <i>Arctic Seal</i> is not listed in Table 1: 2014 Fleet Capabilities, modify the table to include all vessels.
3	IOP 1.7	13	Provide a completion schedule for the projects outlined in the IOP, along with projected completion dates as well as a declaration of who within Shell is responsible for ensuring the work is complete.
4	IOP 1.7	13	The referenced Simultaneous Operations (SIMOPS) plan contains necessary components of an IOP as described in the <i>Review of Shell's 2012 Alaska Offshore Oil and Gas Exploration Program</i> (dated March 8, 2013). Provide BOEM a copy of the SIMOPS plan; or the location(s) where BOEM can review the SIMOPS plan.
5	IOP 1.9	14	Provide a mobilization schedule using an estimated starting date to show the process of Open Water Season Operations.
6	IOP 1.9	14	Provide additional detail regarding who possesses decision-making authority when faced with unplanned interruption to planned 2014 Chukchi Sea exploration drilling operations. (Provide the job title/personnel position for person(s) that would be in charge of the <i>Noble Discoverer</i> .)
7	IOP 2.2	16	The wind walls have been identified as possible safety issue during operations. Describe how wind walls are installed and provide for worker safety in Alaska's Arctic OCS conditions.
8	IOP 2.2	17	Shell addresses slip-trip-fall hazards. Clarify how Shell will manage other hazards such as lockout/tag-out, fire & electrical hazards, crane/lifting & handling, hot-work/confined space, hazardous material management safety, etc., of contactor assets and during operations.
9	IOP 2.3	18	The BSEE regulatory authority of 30 CFR Part 250 Subpart S (SEMS) requires an operator to implement and audit a SEMS program; as well as requiring an independent third party audit of the OCS SEMS program. Amend the list of audits and inspections to include the Third Party Audit to be performed by Bureau Veritas Certification North America Inc.
10	IOP 3.4	27	Clarify how Shell ensures that communication and lines-of-accountability between Shell and the contractors are clearly established; and how Shell holds contractors responsible for their safety performance and safety culture.
11	IOP 4.6	36	Describe the frequency that Shell conducts and validates compliance reviews and the responsible party. Define the actions Shell executes when non-compliance issues are identified.
12	IOP 5.2	38	Lessons learned should not all be limited to major accidents (lagging indicators) or worst-case scenarios, but should include trend analysis of performance using leading indicators. Describe how Shell: <ul style="list-style-type: none"> <li>• Integrates its Hazards and Effects Management Process standard into contractor oversight</li> <li>• Communicates lessons learned to all applicable operational components</li> <li>• Communicates the bow-tie methodology to contractors and integrates the bow-tie methodology into contractor oversight</li> </ul>
13	IOP 5.3	39	The referenced Integrated Activity Plan (IAP) contains necessary components of an IOP as described in the <i>Review of Shell's 2012 Alaska Offshore Oil and Gas Exploration Program</i> (dated March 8, 2013). Provide BOEM a copy of the IAP plan; or the location(s) where BOEM can review the IAP.
14	IOP 6.0	49	BSEE SEMS should be identified as a bulleted item within the listing of Major Approvals/Requirements.