

**BEFORE THE ENVIRONMENTAL APPEALS BOARD  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C.**

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In re: )  
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Shell Gulf of Mexico, Inc. )  
Permit No. R10OCS/PSD-AK-09-01 )  
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and )  
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)

Shell Offshore, Inc. )  
Permit No. R10OCS/PSD-AK-2010-01 )  
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**EXHIBITS IN SUPPORT OF PETITION FOR REVIEW**

**NATURAL RESOURCES DEFENSE COUNCIL, NATIVE VILLAGE OF POINT HOPE,  
RESISTING ENVIRONMENTAL DESTRUCTION ON INDIGENOUS LANDS  
(REDOIL), ALASKA WILDERNESS LEAGUE, AUDUBON ALASKA, CENTER FOR  
BIOLOGICAL DIVERSITY, NORTHERN ALASKA ENVIRONMENTAL CENTER,  
OCEAN CONSERVANCY, OCEANA, PACIFIC ENVIRONMENT, and  
SIERRA CLUB**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OUTER CONTINENTAL SHELF
PREVENTION OF SIGNIFICANT DETERIORATION
PERMIT TO CONSTRUCT

Permit Number: R10OCS/PSD-AK-09-01 Issuance Date: March 31, 2010

In accordance with the provisions of Clean Air Act (CAA) Section 328 and Code of Federal Regulations (CFR) Title 40, Part 55, and the provisions of Part C to Title I of the CAA and 40 CFR § 52.21,

Shell Gulf of Mexico Inc.
3601 C Street, Suite 1000
Anchorage, AK 99503

is authorized to construct and operate the Frontier Discoverer drillship and its air emission units and to conduct other air pollutant emitting activities in accordance with the permit conditions listed in this permit, and only at the following lease blocks from the Chukchi Sea lease sale 193:

- NR02-02: 6819 6820 6821 6822 6868 6869 6870 6871 6872 6918 6919 6920 6921 6922 6968 6969 6970 6971 6972 7018 7019 7020 7021 7022 7023 7068 7069 7072
NR03-01: 6105 6106 6155 6156 6161 6162 6211 6212 6261 6363 6364 6413 6414 6415 6418 6419 6462 6463 6464 6465 6467 6468 6469 6512 6513 6514 6515 6516 6517 6518 6519 6562 6563 6564 6565 6567 6568 6569 6612 6613 6614 6615 6616 6617 6618 6665 6666 6667 6668 6705 6706 6712 6715 6716 6717 6753 6754 6755 6756 6761 6762 6765 6766 6767 6803 6804 6805 6810 6811 6812 6813 6814 6815 6816 6817 6853 6854 6855 6860 6861 6862 6863 6864 6865 6866 6903 6904 6905 6908 6909 6910 6911 6912 6913 6914 6915 6916 6953 6954 6955 6956 6957 6958 6959 6960 6961 6962 6963 6964 6965 7006 7007 7008 7009 7010 7011 7012 7013 7014 7056 7057 7058 7059 7060 7061 7062 7063 7106 7107 7108 7109 7110 7119
NR03-02: 6114 6115 6161 6163 6164 6165 6213 6214 6215 6220 6259 6261 6263 6264 6265 6270 6271 6321 6322 6359 6360 6371 6372 6409 6410 6422 6423 6459 6508 6558 6608 6658 6671 6672 6708 6713 6714 6715 6721 6722 6757 6761 6762 6763 6764 6765 6766 6771 6807 6811 6812 6813 6814 6815 6816 6817 6856 6862 6863 6864 6865 6866 6905 6912 6913 6914 6915 6916
NR04-01: 6352 6401 6402 6452 6453 6503 6504 6554 6604
NR03-03: 6007 6008 6009 6010 6017 6018 6020 6056 6057 6058 6059 6067 6068 6070 6108 6219 6560 6561 6609 6610 6611 6658 6659 6660 6709 6721 6722 6723 6759 6771 6772 6773 6823

Terms not otherwise defined in this permit have the meaning assigned to them in the referenced statutes and regulations. All terms and conditions of the permit are enforceable by the United States Environmental Protection Agency and citizens under the Clean Air Act.

/S/

Richard Albright
Director, Office of Air, Waste and Toxics

March 31, 2010
Date

- 11.11 Record any instance that Icebreaker #1 attaches to the Discoverer.
- 11.12 Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from the boilers and incinerator by using the highest emission factor for each tested boiler or incinerator collected under Conditions N.10.9 and N.10.10 and fuel usage data collected under Condition N.11.7, to determine emissions from that source. For the purposes of this condition, the permittee shall assume that the incinerator has been operated continuously at the maximum operating rate, and shall use the highest emission factor collected under Condition N.10.10.
- 11.13 Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from each engine by using the emission factors for each tested engine collected under Conditions N.10.8 and electrical load data collected under Condition N.11.3, to determine emissions from that source. Emissions shall be calculated for each ten-minute load reading for each engine.
- 11.14 For the purposes of Conditions N.11.12 and N.11.13, if a specific emission unit has not been tested yet, the permittee shall use the highest emission factor for the corresponding load from the test results for any equivalent emission unit in equivalent service that has already been tested.
- 11.15 For the purposes of Conditions N.11.12 and N.11.13, if a specific load reading is missing, the permittee shall calculate the emissions for that missing load reading by using the emission factor and load combination that results in the highest emissions rate for that emissions unit. If the engine in question has not been tested yet, the permittee shall use the emission factor as provided for in Condition N.11.14.

## **O. ICEBREAKER #2**

- 1. Icebreaker #2 Vessel Alternatives.** For a given drilling season, the permittee may use either the Tor Viking or Hull 247 as Icebreaker #2, subject to the conditions in Section O of this permit. Hull 247 is a temporary vessel name assigned by the shipbuilder, Edison Chouest. This permit is intended to apply to this vessel even when renamed with its permanent name.
  - 1.1 The total capacity of all propulsion engines on Icebreaker #2 shall not exceed 17,660 hp for the Tor Viking and 24,000 kW for Hull247;
  - 1.2 The total capacity of all non-propulsion generator engines on Icebreaker #2 shall not exceed 2,336 hp for the Tor Viking and Hull 247 shall not have electrical generation capacity in addition to the engines specified in Condition O.1.1;
  - 1.3 The total capacity of all boilers on Icebreaker #2 shall not exceed 1.37 MMBtu/hr for the Tor Viking and 4.00 MMBtu/hr for Hull 247;
  - 1.4 The total capacity of all incinerators on Icebreaker #2 shall not exceed 151.23 lbs/hr.
  - 1.5 Total uncontrolled emissions of PM<sub>2.5</sub> from all emission sources on board Icebreaker #2 shall not exceed 11.4 lbs/hour.

- 1.5.1 For compliance with Condition O.1.5, measurement of PM<sub>2.5</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 Fed. Reg. 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.
- 1.5.2 For the purposes of Condition O.1.5, emissions from each emission unit shall be based on operation of that emission unit at 100% of rated capacity, except for the propulsion engines, for which emissions shall be based on operation of that emission unit at 80% of rated capacity.
- 1.6 Total uncontrolled emissions of PM<sub>10</sub> from all emission sources on board Icebreaker #2 shall not exceed 11.7 lbs/hour.
  - 1.6.1 For compliance with Condition O.1.6, measurement of PM<sub>10</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 Fed. Reg. 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.
  - 1.6.2 For the purposes of Condition O.1.6, emissions from each emission unit shall be based on operation of that emission unit at 100% of rated capacity, except for the propulsion engines, for which emissions shall be based on operation of that emission unit at 80% of rated capacity.
- 1.7 No later than 45 days prior to deployment to the Chukchi Sea each drilling season, the permittee shall provide notification to EPA of the vessel selected as Icebreaker #2. The notification shall include a list of all emission sources on board the vessel as well as manufacturer, model and rated capacity of each emission source.
- 1.8 At all times that any of the engines on board Icebreaker #2 are in operation, the exhaust from each engine shall be directed to an operating SCR unit.
2. **Capacity Limit on Icebreaker #2 Propulsion Engines.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, the permittee shall limit operation of the propulsion engines in Icebreaker #2 to 80% of rated capacity.
3. **PTE Annual Emission Limits.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, emissions from all emission sources on Icebreaker #2 in aggregate shall not exceed the emission limits specified for each of the pollutants below:
  - 3.1 **NO<sub>x</sub>:** 71.2 tons/rolling 12-month period
    - 3.1.1 For compliance with Condition O.3.1, measurement of NO<sub>x</sub> shall be determined using EPA Method 7E.
4. **PTE Daily Emission Limits.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, emissions from all emission sources on Icebreaker #2 in aggregate shall not exceed the emission limits specified for each of the pollutants below:
  - 4.1 **PM<sub>10</sub>:** 280.5 lbs/day

4.1.1 For compliance with Condition O.4.1, measurement of PM<sub>10</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 Fed. Reg. 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.

4.2 **PM<sub>2.5</sub>:** 272.9 lbs/day

4.2.1 For compliance with Condition O.4.2, measurement of PM<sub>2.5</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 Fed. Reg. 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.

**5. Electrical Power Output Limit.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, the permittee shall not operate the internal combustion engines in excess of:

5.1 18,058,216 kWe-hr from all of the generators on board the Tor Viking in aggregate during any rolling 12-month period; or

5.2 31,904,074 kWe-hr from all of the generators on board Hull 247 in aggregate during any rolling 12-month period; or

5.3 282,867 kWe-hr from all of the generators on board the Tor Viking in aggregate during any calendar day;

5.4 423,936 kWe-hr from all of the generators on board Hull 247 in aggregate during any calendar day;

**6. Fuel Usage Limit.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, the permittee shall not use fuel in excess of:

6.1 40,320 gallons in all heat boilers on board the Tor Viking in aggregate during any rolling 12-month period; or

6.2 120,960 gallons in all heat boilers on board Hull 247 in aggregate during any rolling 12-month period; or

6.3 240 gallons in all heat boilers on board the Tor Viking in aggregate during any calendar day.

6.4 720 gallons in all heat boilers on board Hull 247 in aggregate during any calendar day.

**7. Operating Distance from Discoverer.** Except when transferring crew and supplies to and from the Discoverer, when traveling on other non-icebreaking activities, or as provided for in Conditions O.8 and O.9, Icebreaker #2 shall operate outside of a cone with its apex 150 meters behind the stern of the Discoverer, plus and minus 20 degrees from the centerline of the Discoverer, and extending 1000 meters beyond the bow of the Discoverer.

7.1 For the purpose of Condition O.7, the permittee shall use a global positioning system or laser range finder capable of accuracy to within 10 meters.

- 7.2 For each event when Icebreaker #2 enters the cone described in Condition O.7, the permittee shall record the following information:
  - 7.2.1 The time and date that Icebreaker #2 entered the cone;
  - 7.2.2 The location coordinates where Icebreaker #2 entered the cone;
  - 7.2.3 The time and date that Icebreaker #2 exited the cone;
  - 7.2.4 The location coordinates where Icebreaker #2 exited the cone;
  - 7.2.5 The purpose of Icebreaker #2 entering the cone; and
  - 7.2.6 The operating load of each engine during transit through the cone.
8. **Anchor Handling Operations.** Notwithstanding Conditions O.7, Icebreaker #2 may operate within 1,000 meters of the Discoverer while Icebreaker #2 is being used to either set or retrieve anchors for the Discoverer.
9. **Bow Washing Operations.** Notwithstanding Conditions O.7, Icebreaker #2 may operate within 1,000 meters of the Discoverer while Icebreaker #2 is being used to remove ice from the bow of the Discoverer (i.e. bow washing), subject to the following conditions:
  - 9.1 During bow washing operations, Icebreaker #2 shall operate such that the distance from the rearmost stack on the icebreaker to the centerline (which stretches from the mid-point of the stern to the mid-point of the bow) of the Discoverer shall not be less than 100 meters;
  - 9.2 The permittee shall record the date, hour and minute that Icebreaker #2 begins its approach to the Discoverer to remove bow ice;
  - 9.3 The permittee shall, every 5 minutes after the time in Condition O.9.2, record the distance between the rearmost stack on Icebreaker #2 and the centerline of the Discoverer, until completion of bow washing operations as specified in Condition O.9.4;
  - 9.4 The permittee shall record the date, hour and minute that Icebreaker #2 returns to its ice management position at least 1,000 meters from the Discoverer;
  - 9.5 For the purpose of Condition O.9, the permittee shall use a global positioning system or laser range finder capable of accuracy to within 10 meter.
10. **Attachment to Discoverer.** At no time shall Icebreaker #2 be attached to the Discoverer.
11. **Volume Source Limit for Icebreaker #2.** The permittee shall ensure that the volume source release height of Icebreaker #2 is no less than 25.22 meters.
  - 11.1 For the purposes of Condition O.11, the volume source release height shall be determined by:
    - 11.1.1 The permittee shall obtain the vessel source dimensions and emission source parameters;
    - 11.1.2 The permittee shall determine the volume source release height based on plume rise and by using the following information:

- 11.1.2.1 The SCREEN3 model as set forth in 40 CFR Part 51, Appendix W;
  - 11.1.2.2 An hourly meteorological condition of “D stability,” as that term is used in 40 CFR Part 51, Appendix W;
  - 11.1.2.3 A wind speed of 20 meters per second; and
  - 11.1.2.4 The vessel dimensions and emission source parameters required under Condition O.11.1.1.
- 11.1.3 If EPA promulgates a different screening model in place of SCREEN3 in 40 CFR Part 51, Appendix W, the permittee shall use that newly promulgated screening model to determine the volume source release height.

**12. Stack Test Requirements.** Prior to each of the first two drilling seasons that a vessel is used as Icebreaker #2, and while the Discoverer is operating under this permit in the Chukchi Sea, the permittee shall stack test each propulsion engine, non-propulsion generator engine, boiler and incinerator on Icebreaker #2 as follows:

- 12.1 Each stack test on the propulsion engines shall be conducted at four different loads: 20%, 40%, 60% and 80%.
- 12.2 Each stack test on the non-propulsion generator engines shall be conducted at two different load ranges: 50 – 60 % and 90 - 100%.
- 12.3 Each stack test on the boilers shall be conducted at full loads.
- 12.4 Each stack test on the incinerator shall be conducted at full load.
- 12.5 Each stack test run shall test for emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>.
- 12.6 During each test run for the propulsion engines, generator engines, and boilers, the permittee shall monitor and record the following information:
  - 12.6.1 Quantity of fuel used (in gallons);
  - 12.6.2 Density of the fuel used (in lbs/gallon);
  - 12.6.3 Heat content of the fuel used (in Btu/gallon); and
  - 12.6.4 For the engines, electrical power output (in kWe).
- 12.7 During each test run for the incinerator, the permittee shall monitor and record the quantity of waste material incinerated (in lbs).
- 12.8 For each engine, each load range, and each pollutant, the permittee shall determine emission factors in the following units: lbs/kWe-hr and lbs/gallon.
- 12.9 For each boiler, and each pollutant, the permittee shall determine emission factors in the following units: lbs/MMBtu and lbs/gallon.
- 12.10 For each incinerator, and each pollutant, the permittee shall determine emission factors in the following units: lbs/ton of waste combusted.

**13. Monitoring, Recordkeeping and Reporting.** The permittee shall:

- 13.1 Equip each of the propulsion engines and generator engines on board Icebreaker #2 with an electrical output monitoring device:
  - 13.1.1 Each electrical output monitoring device shall measure the electrical output of the generator attached to each engine with an accuracy equal to or better than 2 percent of the engine's maximum output (in kWe);
  - 13.1.2 Each electrical output monitoring device shall measure the electrical output of the generator attached to each engine at least once every 10 minutes;
  - 13.1.3 Each electrical output monitoring device shall be equipped to record each reading taken as well as provide and record average loads for each hour.
- 13.2 Maintain the accuracy of each electrical output monitoring device in accordance with manufacturer's recommendations.
- 13.3 Monitor and record the electrical load for each engine at least once every ten minutes, and record the average hourly load for each hour.
- 13.4 Equip each of the boilers on board Icebreaker #2 with a diesel fuel flow meter, or install a single fuel meter for all of the boilers:
  - 13.4.1 Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the boiler(s) being served by the meter;
  - 13.4.2 Each fuel flow meter shall be totalizing and nonresettable; and
  - 13.4.3 Each fuel flow meter shall measure the fuel flow rate with accuracy equal to or better than 2 percent of the meter's upper range value.
- 13.5 No less than 60 days before initial deployment of the Discoverer to the Chukchi Sea for the first drilling season, collect information from the manufacturer of each fuel flow meter so as to determine its accuracy. Submit this information to EPA no less than 30 days prior to operation within the Chukchi Sea.
- 13.6 Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.
- 13.7 Monitor and record fuel usage for each boiler.
- 13.8 At least 45 days before deployment to the Discoverer each drilling season, the permittee shall notify the EPA of the volume source release height of Icebreaker #2.
- 13.9 Once each hour, and using a global positioning system or laser range finder capable of accuracy to within 10 meters, measure and record the date, time and location of Icebreaker #2.
- 13.10 Once each hour, monitor and record the date, time, direction the bow of the Discoverer is pointed, and wind direction at the Discoverer.
- 13.11 Record any instance that Icebreaker #2 attaches to the Discoverer.



- 13.12 Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from the boilers and incinerator by using the highest emission factor for each tested boiler or incinerator collected under Conditions O.12.9 and O.12.10 and fuel usage data collected under Condition O.13.7, to determine emissions from that source. For the purposes of this condition, the permittee shall assume that the incinerator has been operated continuously at the maximum operating rate, and shall use the highest emission factor collected under Condition O.12.10.
- 13.13 Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from each engine by using the emission factors for each tested engine collected under Conditions O.12.8 and electrical load data collected under Condition O.13.3, to determine emissions from that source. Emissions shall be calculated for each ten-minute load reading for each engine.
- 13.14 For the purposes of Conditions O.13.12 and O.13.13, if a specific emission unit has not been tested yet, the permittee shall use the highest emission factor for the corresponding load from the test results from an equivalent emission unit in equivalent service that has already been tested.
- 13.15 For the purposes of Conditions O.13.12 and O.13.13, if a specific load reading is missing, the permittee shall calculate the emissions for that missing load reading by using the emission factor and load combination that results in the highest emissions rate for that emissions unit. If the engine in question has not been tested yet, the permittee shall use the emission factor as provided for in Condition O.13.14.
- 13.16 Monitor and record at least once every 15 minutes the following parameters associated with each SCR system aboard Icebreaker #2:
- 13.16.1 Operational status of urea pump; and
  - 13.16.2 Stack temperature upstream of the catalyst.
- 13.17 For the purpose of Condition O.13.13, if either the urea pump is not operating or if the catalyst inlet temperature, measured in Condition O.13.16.2, is less than 250°C, calculate emissions of NO<sub>x</sub> for the affected time period by using an uncontrolled emission factor obtained by applying a 95% NO<sub>x</sub>-reduction efficiency to the emission factor determined pursuant to Condition O.12.8

## **P. SUPPLY SHIP**

- 1. Operational Limits on Supply Ship Engines.** At all times while the Discoverer is an OCS Source and the supply ship is within 25 miles of the Discoverer, the permittee shall:
- 1.1 Not operate the emergency engine;
  - 1.2 Limit operation of the propulsion engines in the supply ship to no greater than the limit as determined by the equation below:

$$\text{Operating limit (in percent of full load)} = (5760 - (X - 584)) / (7784 - X) * 100$$



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 10**  
 1200 Sixth Avenue, Suite 900  
 Seattle, Washington 98101-3140

**OUTER CONTINENTAL SHELF**  
**PREVENTION OF SIGNIFICANT DETERIORATION**  
**PERMIT TO CONSTRUCT**

Permit Number: R10OCS/PSD-AK-2010-01 Issuance Date: April 9, 2010

In accordance with the provisions of Clean Air Act Section 328 and Code of Federal Regulations (C.F.R.) Title 40, Part 55, and the provisions of Part C to Title I of the Clean Air Act and 40 C.F.R. § 52.21,

Shell Offshore Inc.  
 3601 C Street, Suite 1000  
 Anchorage, AK 99503

is authorized to construct and operate the Frontier Discoverer drillship and its air emission units and to conduct other air pollutant emitting activities in accordance with the permit conditions listed in this permit, and only at the following lease blocks from the Beaufort Sea lease sales 195 and 202:

- BF 195: 6657 6658 6659 6707 6708 6709 6712 6713 6751 6752 6757 6758 6764 6773 6774 6801  
 6802 6814 6815 6822 6823 6824 6851 6873 6874
- BF 202: 6259 6308 6309 6310 6359 6406 6407 6409 6410 6457 6459 6460 6461 6508 6510 6511  
 6512 6558 6559 6560 6561 6562 6609 6610 6611 6612 6660 6662

Terms not otherwise defined in this permit have the meaning assigned to them in the referenced statutes and regulations. All terms and conditions of the permit are enforceable by the United States Environmental Protection Agency and citizens under the Clean Air Act.

/S/

\_\_\_\_\_  
 Richard Albright  
 Director, Office of Air, Waste and Toxics

April 9, 2010  
 Date

- 11.12. Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from the boilers and incinerator by using the highest emission factor for each tested boiler or incinerator collected under Conditions O.10.9 and O.10.10 and fuel usage data collected under Condition O.11.7, to determine emissions from that source. For the purposes of this condition, the permittee shall assume that the incinerator has been operated continuously at the maximum operating rate, and shall use the highest emission factor collected under Condition O.10.10.
- 11.13. Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from each engine by using the emission factors for each tested engine collected under Condition O.10.8 and electrical load data collected under Condition O.11.3, to determine emissions from that source. Emissions shall be calculated for each ten-minute load reading for each engine.
- 11.14. For the purposes of Conditions O.11.12 and O.11.3, if a specific emission unit has not been tested yet, the permittee shall use the highest emission factor for the corresponding load from the test results for any equivalent emission unit in equivalent service that has already been tested.
- 11.15. For the purposes of Conditions O.11.12 and O.11.3, if a specific load reading is missing, the permittee shall calculate the emissions for that missing load reading by using the emission factor and load combination that results in the highest emissions rate for that emissions unit. If the engine in question has not been tested yet, the permittee shall use the emission factor as provided for in Condition O.11.14.

**P. ICEBREAKER #2**

1. **Icebreaker #2 Vessel Alternatives.** For a given drilling season, the permittee may use either the Tor Viking or Hull 247 as Icebreaker #2, subject to the conditions in Section O of this permit. Hull 247 is a temporary vessel name assigned by the shipbuilder, Edison Chouest. This permit is intended to apply to this vessel even when renamed with its permanent name.
  - 1.1. The total capacity of all propulsion engines on Icebreaker #2 shall not exceed 17,660 hp for the Tor Viking and 24,000 kW for Hull 247.
  - 1.2. The total capacity of all non-propulsion generator engines on Icebreaker #2 shall not exceed 2,336 hp for the Tor Viking and 0 hp for Hull 247 shall not have electrical generation capacity in addition to the engines specified in Condition P.1.1.
  - 1.3. The total capacity of all boilers on Icebreaker #2 shall not exceed 1.37 MMBtu/hr for the Tor Viking and 4.00 MMBtu/hr for Hull 247.
  - 1.4. The total capacity of all incinerators on Icebreaker #2 shall not exceed 151.23 lbs/hr.
  - 1.5. Total uncontrolled emissions of PM<sub>2.5</sub> from all emission sources on board Icebreaker #2 shall not exceed 11.4 lbs/hour.

- 1.5.1. For compliance with Condition P.1.5, measurement of PM<sub>2.5</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 FR 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.
  - 1.5.2. For the purposes of Condition P.1.5, emissions from each emission unit shall be based on operation of that emission unit at 100 percent of rated capacity, except for the propulsion engines, for which emissions shall be based on operation of that emission unit at 80 percent of rated capacity.
- 1.6. Total uncontrolled emissions of PM<sub>10</sub> from all emission sources on board Icebreaker #2 shall not exceed 11.7 lbs/hour.
  - 1.6.1. For compliance with Condition P.1.6, measurement of PM<sub>10</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 FR 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.
  - 1.6.2. For the purposes of Condition P.1.6, emissions from each emission unit shall be based on operation of that emission unit at 100 percent of rated capacity, except for the propulsion engines, for which emissions shall be based on operation of that emission unit at 80 percent of rated capacity.
- 1.7. No later than 45 days prior to deployment to the Beaufort Sea each drilling season, the permittee shall provide notification to EPA of the vessel selected as Icebreaker #2. The notification shall include a list of all emission sources on board the vessel as well as manufacturer, model and rated capacity of each emission source.
- 1.8. At all times that any of the engines on board Icebreaker #2 are in operation, the exhaust from each engine shall be directed to an operating SCR emission unit.
2. **Capacity Limit on Icebreaker #2 Propulsion Engines.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, the permittee shall limit operation of the propulsion engines in Icebreaker #2 to 80 percent of rated capacity.
3. **PTE Annual Emission Limits.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, emissions from all emission sources on Icebreaker #2 in aggregate shall not exceed the emission limits specified for each of the pollutants below.
  - 3.1. **NO<sub>x</sub>:** 71.2 tons/rolling 12-month period
    - 3.1.1. For compliance with Condition P.3.1, measurement of NO<sub>x</sub> shall be determined using EPA Method 7E.
4. **PTE Daily Emission Limits.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, emissions from all emission sources on Icebreaker #2 in aggregate shall not exceed the emission limits specified for each of the pollutants below:

- 4.1. **PM<sub>10</sub>:** 280.5 lbs/day
  - 4.1.1. For compliance with Condition P.4.1, measurement of PM<sub>10</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 FR 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.
- 4.2. **PM<sub>2.5</sub>:** 272.9 lbs/day
  - 4.2.1. For compliance with Condition P.4.2, measurement of PM<sub>2.5</sub> shall be determined using EPA Method 201/201A and OTM 28, provided, however, that if proposed changes to Method 202 in 56 FR 12970 (March 25, 2009) become final and effective, EPA Method 202 shall be used in lieu of OTM 28.
5. **Electrical Power Output Limit.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, the permittee shall not operate the internal combustion engines in excess of:
  - 5.1. 18,058,216 kWe-hr from all of the generators on board the Tor Viking in aggregate during any rolling 12-month period.
  - 5.2. 31,904,074 kWe-hr from all of the generators on board Hull 247 in aggregate during any rolling 12-month period.
  - 5.3. 282,867 kWe-hr from all of the generators on board the Tor Viking in aggregate during any calendar day.
  - 5.4. 423,936 kWe-hr from all of the generators on board Hull 247 in aggregate during any calendar day.
6. **Fuel Usage Limit.** At all times while the Discoverer is an OCS Source and Icebreaker #2 is within 25 miles of the Discoverer, the permittee shall not use fuel in excess of:
  - 6.1. 40,320 gallons in all heat boilers on board the Tor Viking in aggregate during any rolling 12-month period.
  - 6.2. 120,960 gallons in all heat boilers on board Hull 247 in aggregate during any rolling 12-month period.
  - 6.3. 240 gallons in all heat boilers on board the Tor Viking in aggregate during any calendar day.
  - 6.4. 720 gallons in all heat boilers on board Hull 247 in aggregate during any calendar day.
7. **Operating Distance from Discoverer.** Except when transferring crew and supplies to and from the Discoverer, when traveling on other non-icebreaking activities, or as provided for in Conditions O.8 and O.9, Icebreaker #2 shall operate outside of a cone with its apex 150 meters behind the stern of the Discoverer, plus and minus 20 degrees from the centerline of the Discoverer, and extending 1000 meters beyond the bow of the Discoverer.

- 7.1. For the purpose of Condition P.7, the permittee shall use a global positioning system or laser range finder capable of accuracy to within 10 meters.
- 7.2. For each event when Icebreaker #2 enters the cone described in Condition O.7, the permittee shall record the following information:
  - 7.2.1. The time and date that Icebreaker #2 entered the cone;
  - 7.2.2. The location coordinates where Icebreaker #2 entered the cone;
  - 7.2.3. The time and date that Icebreaker #2 exited the cone;
  - 7.2.4. The location coordinates where Icebreaker #2 exited the cone;
  - 7.2.5. The purpose of Icebreaker #2 entering the cone; and
  - 7.2.6. The operating load of each engine during transit through the cone.
8. **Anchor Handling Operations.** Notwithstanding Condition P.7, Icebreaker #2 may operate within 1,000 meters of the Discoverer while Icebreaker #2 is being used to either set or retrieve anchors for the Discoverer.
9. **Bow Washing Operations.** Notwithstanding Condition P.7, Icebreaker #2 may operate within 1,000 meters of the Discoverer while Icebreaker #2 is being used to remove ice from the bow of the Discoverer (i.e. bow washing), subject to the following conditions.
  - 9.1. The permittee shall record the date, hour and minute that Icebreaker #2 begins its approach to the Discoverer to remove bow ice.
  - 9.2. The permittee shall record the date, hour and minute that Icebreaker #2 returns to its ice management position at least 1,000 meters from the Discoverer.
10. **Attachment to Discoverer.** At no time shall Icebreaker #2 be attached to the Discoverer.
11. **Volume Source Limit for Icebreaker #2.** The permittee shall ensure that the volume source release height of Icebreaker #2 is no less than 25.22 meters.
  - 11.1. For the purposes of Condition P.11, the volume source release height shall be determined by:
    - 11.1.1. The permittee shall obtain the vessel source dimensions and emission source parameters;
    - 11.1.2. The permittee shall determine the volume source release height based on plume rise and by using the following information:
      - 11.1.2.1. The SCREEN3 model as set forth in 40 C.F.R. Part 51, Appendix W;
      - 11.1.2.2. An hourly meteorological condition of “D stability,” as that term is used in 40 C.F.R. Part 51, Appendix W;
      - 11.1.2.3. A wind speed of 20 meters per second; and
      - 11.1.2.4. The vessel dimensions and emission source parameters required under Condition P.11.1.1.

- 11.1.3. If EPA promulgates a different screening model in place of SCREEN3 in 40 C.F.R. Part 51, Appendix W, the permittee shall use that newly promulgated screening model to determine the volume source release height.
12. **Stack Test Requirements.** Prior to each of the first two drilling seasons that a vessel is used as Icebreaker #2, and while the Discoverer is operating under this permit in the Beaufort Sea, the permittee shall stack test each propulsion engine, non-propulsion generator engine, boiler and incinerator on Icebreaker #2 as follows:
  - 12.1. Each stack test on the propulsion engines shall be conducted at four different loads: 20 percent, 40 percent, 60 percent and 80 percent.
  - 12.2. Each stack test on the non-propulsion generator engines shall be conducted at two different load ranges: 50 - 60 percent and 90 - 100 percent.
  - 12.3. Each stack test on the boilers shall be conducted at full loads.
  - 12.4. Each stack test on the incinerator shall be conducted at full load.
  - 12.5. Each stack test run shall test for emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>.
  - 12.6. During each test run for the propulsion engines, generator engines, and boilers, the permittee shall monitor and record the following information:
    - 12.6.1. Quantity of fuel used (in gallons);
    - 12.6.2. Density of the fuel used (in lbs/gallon);
    - 12.6.3. Heat content of the fuel used (in Btu/gallon); and
    - 12.6.4. For the engines, electrical power output (in kWe).
  - 12.7. During each test run for the incinerator, the permittee shall monitor and record the quantity of waste material incinerated (in lbs).
  - 12.8. For each engine, each load range, and each pollutant, the permittee shall determine emission factors in the following units: lbs/kWe-hr and lbs/gallon.
  - 12.9. For each boiler, and each pollutant, the permittee shall determine emission factors in the following units: lbs/MMBtu and lbs/gallon.
  - 12.10. For each incinerator, and each pollutant, the permittee shall determine emission factors in the following units: lbs/ton of waste combusted.
13. **Monitoring, Recordkeeping and Reporting.** The permittee shall:
  - 13.1. Equip each of the propulsion engines and generator engines on board Icebreaker #2 with an electrical output monitoring device:
    - 13.1.1. Each electrical output monitoring device shall measure the electrical output of the generator attached to each engine with an accuracy equal to or better than 2 percent of the engine's maximum output (in kWe).

- 13.1.2. Each electrical output monitoring device shall measure the electrical output of the generator attached to each engine at least once every 10 minutes.
- 13.1.3. Each electrical output monitoring device shall be equipped to record each reading taken as well as provide and record average loads for each hour.
- 13.2. Maintain the accuracy of each electrical output monitoring device in accordance with manufacturer's recommendations.
- 13.3. Monitor and record the electrical load for each engine at least once every ten minutes, and record the average hourly load for each hour.
- 13.4. Equip each of the boilers on board Icebreaker #2 with a diesel fuel flow meter or install a single fuel meter for all of the boilers:
  - 13.4.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the boiler(s) being served by the meter;
  - 13.4.2. Each fuel flow meter shall be totalizing and non-resettable; and
  - 13.4.3. Each fuel flow meter shall measure the fuel flow rate with accuracy equal to or better than 2 percent of the meter's upper range value.
- 13.5. No less than 60 days before initial deployment of the Discoverer to the Beaufort Sea for the first drilling season, collect information from the manufacturer of each fuel flow meter so as to determine its accuracy. Submit this information to EPA no less than 30 days prior to operation within the Beaufort Sea.
- 13.6. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.
- 13.7. Monitor and record fuel usage for each boiler.
- 13.8. At least 45 days before deployment to the Discoverer each drilling season, the permittee shall notify the EPA of the volume source release height of Icebreaker #2.
- 13.9. Once each hour, and using a global positioning system or laser range finder capable of accuracy to within 10 meters, measure and record the date, time and location of Icebreaker #2.
- 13.10. Once each hour, monitor and record the date, time, direction the bow of the Discoverer is pointed, and wind direction at the Discoverer.
- 13.11. Record any instance that Icebreaker #2 attaches to the Discoverer.



- 13.12. Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from the boilers and incinerator by using the highest emission factor for each tested boiler or incinerator collected under Conditions P.12.9 and P.12.10 and fuel usage data collected under Condition P.13.7, to determine emissions from that source. For the purposes of this condition, the permittee shall assume that the incinerator has been operated continuously at the maximum operating rate, and shall use the highest emission factor collected under Condition P.12.10.
- 13.13. Each day, calculate and record for the previous calendar day, the emissions of NO<sub>x</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> in pounds per day from each engine by using the emission factors for each tested engine collected under Conditions P.12.8 and electrical load data collected under Condition P.13.3, to determine emissions from that source. Emissions shall be calculated for each ten-minute load reading for each engine.
- 13.14. For the purposes of Conditions P.13.12 and P.13.13, if a specific emission unit has not been tested yet, the permittee shall use the highest emission factor for the corresponding load from the test results from an equivalent emission unit in equivalent service that has already been tested.
- 13.15. For the purposes of Conditions P.13.12 and P.13.13, if a specific load reading is missing, the permittee shall calculate the emissions for that missing load reading by using the emission factor and load combination that results in the highest emissions rate for that emissions unit. If the engine in question has not been tested yet, the permittee shall use the emission factor as provided for in Condition P.13.14.
- 13.16. Monitor and record at least once every 15 minutes the following parameters associated with each SCR system aboard Icebreaker #2:
  - 13.16.1. Operational status of urea pump; and
  - 13.16.2. Stack temperature upstream of the catalyst.
- 13.17. For the purpose of Condition P.13.13, if either the urea pump is not operating or if the catalyst inlet temperature, measured in Condition P.13.16.2, is less than 250°C, calculate emissions of NO<sub>x</sub> for the affected time period by using an uncontrolled emission factor obtained by applying a 95 percent NO<sub>x</sub>-reduction efficiency to the emission factor determined pursuant to Condition P.12.8.

**Q. SUPPLY SHIP/BARGE AND TUG**

1. **Operational Limits on Supply Ship Engines.** At all times while the Discoverer is an OCS Source and the supply ship is within 25 miles of the Discoverer, the permittee shall:
  - 1.1. Not operate the emergency engine:

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
SEATTLE, WASHINGTON**

**RESPONSE TO COMMENTS  
FOR  
OUTER CONTINENTAL SHELF  
PREVENTION OF SIGNIFICANT DETERIORATION  
PERMIT NO. R10OCS/PSD-AK-2010-01**

**SHELL OFFSHORE INC.  
FRONTIER DISCOVERER DRILLSHIP  
BEAUFORT SEA EXPLORATION DRILLING PROGRAM**

DATE OF FINAL PERMIT: APRIL 9, 2010

**Exhibit 9, page 1 of 8**

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the principle that non-road engines are not subject to regulation as stationary sources.

Commenter states that EPA’s application of BACT to support and supply vessels (such as Icebreakers #1 and #2, Cuttings/Mud Disposal Barge, Supply Ship/Barge and Tug) even when they are not attached to the OCS source is contrary to EPA’s regulations, which they say only requires the BACT analysis for vessels when they are attached to the OCS Source. The comment claims that if the BACT analysis is done properly here, the emissions contribution of these vessels would be so small that no additional controls would be justified on a dollar per ton basis.

**Response:** Similar comments were received on the proposed Chukchi permit. As explained in the Beaufort Statement of Basis and Chukchi Response to Comments, the exclusion of nonroad engines from the general definition of “stationary source” in Section 302(z) of the CAA is overridden by the more specific definition of “OCS source” in Section 328 of the CAA. Therefore, emissions from these otherwise nonroad engines on drill ships and support vessels are considered as “potential emissions” from the OCS source and nonroad engines that are part of the OCS Source are subject to regulation as stationary sources. Beaufort Statement of Basis, pp. 25-26, citing CAA Section 328(a)(4)(C); see also 40 C.F.R. § 55.2.

The commenter errs in the allegation that EPA has applied BACT to support vessels when they are not attached to the OCS source. The permit does not include any BACT emission limitations for support vessels that apply when those vessels are not attached to the Discoverer. The only vessel that attaches to the Discoverer and which has “stationary source-related” emissions is the supply ship and, with the exception of the use of ultra-low sulfur diesel fuel, BACT was determined to be no additional controls. Note that the permit does include ambient air quality based emission limits for most of the support fleet when within 25 miles of the OCS source but these limits are not BACT emission limits.

See response to comment E above and Chukchi Response to Comments Category F (Definition of OCS Source) Comment F.4 above for why otherwise nonroad engines are subject to regulation as stationary engines under Section 328 of the Act.

## **G. CATEGORY – REGULATION OF ASSOCIATED FLEET AS PART OF OCS SOURCE**

### **G.1 SUBCATEGORY - ASSOCIATED FLEET AND BACT**

**Comment:** Commenter asserts that EPA is incorrect to limit its application of BACT only to the drillship and vessels attached to the drillship and that EPA has

not even fully explained its application of its own flawed approach. EPA has interpreted when a vessel is attached so as to constitute part of the OCS source by analogy to the rule governing when a vessel is part of a marine terminal stationary source. 57 Fed. Reg. 40,792, 40,793 (1992). A vessel at a marine terminal is part of the stationary source when it is attached dockside and performing activities that directly serve the terminal. 45 Fed. Reg. 52,676, 52,696 (1980). Two vessels not regulated with BACT restrictions appear to meet this definition. Shell will use a vessel, likely the Nanuq, to refuel the Discoverer. Statement of Basis at 118-19. That ship will be attached to the drillship and may be part of the OCS source during refueling, and even under EPA's approach, should be subject to BACT. See *id.* at 118-19. Also, “[w]hen the ice breaker fleet needs supplies, personnel, or assistance from the Discoverer, either the primary ice breaker or the anchor handler will approach the Discoverer, dock briefly, and then return to the normal ice management location.” *Id.* at 117 (emphasis added). Thus, it appears that the Nanuq and the icebreakers may at times be part of the OCS source because they will be performing activities that serve the Discoverer directly and, if they do attach to the Discoverer, will be in positions analogous to a vessel dockside at a marine terminal. See *id.* at 118-19.]

**Response:** See generally Chukchi Response to Comments Category G (Regulation of Associated Fleet as Part of OCS Source) which discusses regulation of the associated fleet as part of the OCS source. As explained in that document, under the regulatory definition of “OCS source,” only vessels that are “attached to the seabed and erected thereon and used for the purpose of exploring, developing, or producing resources therefrom...” or that are attached to an OCS facility are considered an OCS source and subject to regulation as stationary sources under the PSD program.

Icebreaker #1 and #2 are both prohibited from attaching to the Discoverer See Permit Condition O.8 and P.9. Similarly, Permit Condition R.6 provides that: At no time shall the Arctic Endeavor Barge, Point Barrow Tug, Nanuq, Rozema Skimmer, or any Kvichak work boats be attached to the Discoverer. Thus commenter's concern is without merit.

While the Nanuq may be used to transfer fuel to the Discoverer via a fuel line, which is not connected to the Discoverer. The Nanuq's propulsion engines will be used to maintain its position and while doing so is operating as a marine vessel. As explained in the Chukchi response to comments, Section G1.a., the OCS regulations make clear that, although the emissions from a vessel servicing an OCS source and within 25 miles of the OCS source are not regulated as part of the OCS source, emissions from such vessels are considered to be emissions from the OCS source and thus are considered in the ambient air quality impact analysis and offset calculations. 57 Fed. Reg. at 40794. Although this permit does not

impose BACT on emission units that comprise the Associated Fleet (except for the supply vessels when attached to the Discoverer when the Discoverer is an OCS source), the permit does limit emissions from the Associated Fleet to ensure that the potential emissions of the OCS source do not cause or contribute to a violation of the NAAQS or violate increment.

**Comment:** Another commenter asserts that EPA improperly applied BACT to the Associated Fleet even when they are not attached to the OCS source and that this runs afoul of EPA’s regulations, which only requires the BACT analysis for vessels when they are attached to the OCS Source. The commenter further contends that if the BACT analysis is done properly here, the emissions contribution of these vessels would be so small that no additional controls would be justified on a dollar per ton basis.

**Response:** Contrary to the comment, except for the supply vessel and the cuttings/mud barge, the vessels in the Associated Fleet will not be physically attached to the Discoverer, and therefore will not be part of the OCS source and are not subject to the BACT requirement. BACT is not applied to the Associated Fleet. See Beaufort Statement of Basis p. 93. EPA agrees that the emissions from the supply vessel when tied to the Discoverer are very small and that, with the exception of utilizing ultra-low sulfur fuel (“ULSF”) the installation of any additional control technology on the supply vessels would not be cost effective. Id.

## **H. CATEGORY – BACT ANALYSIS IN GENERAL**

**Comment:** A commenter questions EPA’s acceptance of Shell’s voluntary use of ULSF as BACT for sulfur dioxide (“SO<sub>2</sub>”) for Diesel Internal Combustion (“IC”) Engines, Boilers and Incinerators and states that EPA failed to do a complete BACT analysis, because the Agency never gets to the economic analysis part of the process in Step 4 of the Top Down method. Commenter contends this is an erroneous determination and characterization and comments that while ULSF may be BACT for Shell in this permit, it is not precedent setting for subsequent permittees because only BACT that has undergone complete BACT analysis, including the dollar per ton cost analysis, can be determined to be BACT for all subsequent permittees. EPA compounds its error when it applies this same incorrect reasoning to bootstrap its conclusion regarding BACT for particulate matter (“PM”) in Generator Diesel IC Engines and PM for Smaller Diesel IC Engines.

**Response:** The use of ULSF in the diesel engines and other combustion sources on the Discoverer was derived from the BACT process not from a voluntary action by Shell. In the permit application dated January 18, 2010, Shell went through the five step BACT process for SO<sub>2</sub> (pp. 59-60). Shell

requires an analysis of factors that are relevant to determining the effect of emissions from a proposed facility on an air quality control region. 42 U.S.C. § 7475(e)(3). Shell's black carbon emissions are a relevant factor to a determination of the effect of Shell's emissions on the North Slope region, and EPA must analyze the effect of those emissions.

**Response:** Black carbon is not a "regulated NSR pollutant" under the PSD program, nor is it regulated under any other federal standards that apply to Shell's exploration drilling operations. To the extent black carbon is comprised of particulate matter, it is regulated as particulate matter – PM<sub>10</sub> and PM<sub>2.5</sub> – in this permit, and EPA notes that emissions of those pollutants are substantially reduced by the emission limitations and control requirements in this permit. In addition, EPA's review of Shell's permit application shows that emissions from Shell's operations allowed under this permit will not interfere with attainment or maintenance of the NAAQS for PM<sub>10</sub> or PM<sub>2.5</sub> or applicable increments.

The requirements of Section 165(e) of the CAA are implemented through Sections 52.21(m) and 52.21(o) of EPA's regulation. EPA has completed the analysis called for in these portions of the regulations, which do not require independent consideration of black carbon emissions in this context. The analysis described in Section 165(e)(3) of the CAA is applicable to "each pollutant regulated under this chapter." 42 U.S.C. § 7475(e)(3)(B); *see also*, 42 U.S.C. § 7475(e)(1). EPA does not presently consider black carbon to be a pollutant subject to regulation under the CAA because emissions of this substance are at most included among an aggregate pollutant (particulate matter) and not independently subject to any control or limitation on emissions. *See, e.g.*, Memorandum from Stephen L. Johnson, Administrator to Regional Administrators, EPA's Interpretation of Regulations that Determine Pollutants Covered By Federal Prevention of Significant Deterioration (PSD) Permit Program, page 6 fn. 6; 75 Fed. Reg. 17004 (Apr. 2, 2010) (including Response to Comments document, Section 11.2).

**Comment:** Commenters assert that after assessing the potential effects of Shell's black carbon emissions, EPA must consider these effects in determining BACT. In determining BACT for Shell's emissions units, EPA evaluates the pollution controls, *inter alia*, in light of the environmental impacts of the control options. 40 C.F.R. § 52.21(b)(12); Statement of Basis at 61-62. In considering pollution controls for PM<sub>2.5</sub>, EPA should evaluate whether some filters will provide the additional environmental benefit of reducing black carbon emissions, and select as BACT control technology that will reduce Shell's black carbon emissions significantly.

**Response:** As explained above, black carbon "is not a regulated NSR pollutant" for the purposes of PSD permitting requirements. Accordingly, the final



permit does not contain BACT limits for black carbon emissions, and EPA has not undertaken the accompanying analysis of control technologies for these emissions. EPA did analyze a variety of control technologies for PM<sub>2.5</sub> emissions, of which black carbon is a component, and determined that either CDPF or oxidation catalyst control was BACT for each particular emissions unit on the Discoverer. CDPF was eliminated as BACT for PM<sub>2.5</sub> for some engines in the top-down analysis based on technical and economic considerations. Moreover, the tools necessary to evaluate the impacts of black carbon are not yet refined enough to be applied in the manner suggested by the commenter. While general research regarding black carbon emissions and their impacts is available, there continues to be uncertainty regarding the specific quantities of black carbon emitted from different types of sources and from different types of control technologies. In addition, the current tools do not allow us to characterize and quantify the specific environmental impacts of those emissions from individual sources, such as the drill ship at issue in this permitting action. Because the commenters have not shown that consideration of the environmental impacts of black carbon emissions would have changed the BACT assessment, there is nothing in the permit record to indicate that EPA should alter the PM<sub>2.5</sub> BACT determinations in this permit.

We also note that, as identified in our analysis, a majority of the PM<sub>2.5</sub> emissions, and thus black carbon emissions, will originate from the various support vessels. As explained above, those support vessels are generally not subject to emission controls under the PSD program.

## **II. CATEGORY – NEW NAAQS FOR NITROGEN DIOXIDE**

**Comment:** Some commenters explained that EPA has established a new 1-hour NO<sub>2</sub> standard at a level of 100 ppb (188 µg/m<sup>3</sup>). 75 Fed. Reg. 6474 (2010). This new standard likely will be in force before the effective date of Shell's permit, if issued, see 40 C.F.R. § 124.15, and commenters believe that Shell's operations may not comply with this new standard. Shell's operations alone will cause a maximum annual NO<sub>2</sub> concentration of 19.1 µg/m<sup>3</sup>. Beaufort Statement of Basis at 98. Applying EPA's scaling factor to this concentration – the maximum 1-hour concentration being equal to ten-times the maximum annual concentration – yields a maximum 1-hour NO<sub>2</sub> concentration of 191 µg/m<sup>3</sup>. This exceeds the new NAAQS of 188 µg/m<sup>3</sup>, without even accounting for background concentrations. The commenters state EPA should not issue a permit that it knows may result in the violation of standards EPA has already promulgated in a final rule, and should ensure that Shell's operations will comply with the new 1-hour NO<sub>2</sub> standards.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
SEATTLE, WASHINGTON**

**RESPONSE TO COMMENTS  
FOR  
OUTER CONTINENTAL SHELF  
PREVENTION OF SIGNIFICANT DETERIORATION  
PERMIT NO. R10OCS/PSD-AK-09-01**

**SHELL GULF OF MEXICO INC.  
FRONTIER DISCOVERER DRILLSHIP  
CHUKCHI SEA EXPLORATION DRILLING PROGRAM**

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when Shell submits its Title V permit application within one year of commencing operations.

## **F CATEGORY – DEFINITION OF OCS SOURCE**

### **F.1 Subcategory - Statutory Definition of OCS Source As Compared to Regulatory Definition**

**F.1.a Comment:** Several commenters contend that EPA’s definition of “OCS source” in 40 C.F.R. § 55.2 impermissibly narrows the statutory definition of “OCS source” in CAA Section 328. The commenters also note that Congress provided in Section 328 that an OCS source includes equipment “authorized” under the Outer Continental Shelf Lands Act (OCSLA) and not just regulated under OCSLA and that vessels authorized under the OCSLA include not only those attached to the seabed, but also those involved with exploration, development, and production, which in turn under OCSLA includes vessels that never attach to the seabed, such as seismic testing with ships, and the transfer of minerals to shore as provided in 43 U.S.C. § 1331(k), (l) and (m). These commenters assert that Congress’s definition of OCS source is unambiguous and EPA did not have authority to replace Congress’s inclusive definition of OCS source with an exclusive one, citing to *Massachusetts v. EPA*, 549 U.S. at 528-529. Because Congress only required that an OCS source meet the three elements listed in subsections (i)-(ii) of the definition of OCS source in Section 328 of the CAA, the commenters continue, EPA did not have authority to limit the definition to those vessels that are attached to the seabed and that, by doing so, EPA impermissibly excluded an entire category of vessels that are authorized under the OCSLA but are not attached to the seabed. The commenters state that nothing in the statutory definition of OCS source suggests that the time at which a drill ship becomes an OCS source hinges on whether the vessel is attached to the seabed and that the Discoverer meets the three statutory elements days before the anchoring process even begins, triggering the statute’s jurisdiction.

**Response:** These comments appear to present a challenge to the definition of “OCS source” in the OCS regulations at 40 C.F.R. § 55.2, and not to EPA’s application of the regulation to this permitting action. Under Section 307(b) of the Clean Air Act, a petition for review of EPA’s promulgation of any nationally applicable regulations promulgated under the Clean Air Act must be filed in the United States Court of Appeals for the District of Columbia within sixty days from the date notice of such promulgation appears in the Federal Register, unless such challenge is based solely on grounds arising after such sixtieth day. As such, any challenge to EPA’s definition of OCS source was required to be raised within 60 days of promulgation of 40 C.F.R. Part 55. The OCS regulations were promulgated on September 4, 1992, and the time has long since passed for challenging the regulations themselves. In addition, the regulation’s distinction between attached and detached vessels has been upheld as a permissible reading of the statute and EPA’s interpretation that the OCS source does not include vessels that were

merely traveling over the OCS was held to be reasonable. *See Santa Barbara County Air Pollution Control Dist. v. EPA*, 31 F.3d 1179, 1181 (D.C. Cir. 1994) (holding that the regulation’s distinction between attached and detached vessels is a permissible reading of the statute and that it was reasonable for EPA to conclude that the OCS source does not include vessels that were merely traveling over the OCS); *see also In re Shell Offshore Inc., Kulluk Drilling Unit and Frontier Discoverer Drilling Unit, Order Denying Review In Part and Remanding In Part*, 13 E.A.D. \_\_ (September 14, 2007), Slip Opinion at 25 (hereafter cited as “Kulluk EAB Decision”).

**F.1.b Comment:** By interpreting the definition of OCS source to require attachment, commenters assert, EPA’s regulatory definition of OCS source fails to regulate the emissions from the Discoverer when it engages in pre-construction activities—namely mudline cellar construction. The commenters continue that OCSLA regulates a wide range of activities related to exploratory drilling on the OCS, many of which occur without any direct attachment to the seabed. As an example, the commenters point to Section 4(d)(1) of OCSLA, which authorizes the United States Coast Guard (Coast Guard) “to promulgate . . . regulations with respect to lights and other warning devices, safety equipment, and other matters relating to the promotion of safety of life and property on the artificial islands, installation, and other devices referred to in [section 4(a)(1)] or on the waters adjacent thereto. . . .” 43 U.S.C. § 1333(d)(1) (emphasis added); *see also id.* at § 1340(b) (all exploration must comply with OCSLA,); *id.* at § 1331(k) (defining “exploration” as, *inter alia*, “the process of searching for minerals, including . . . geophysical surveys where magnetic, gravity, seismic, or other systems are used to detect or imply the presence of such minerals.”).

**Response:** See response to Comment F.1.a with respect to concerns that EPA has impermissibly narrowed the regulatory definition of OCS source.

## **F.2 Subcategory - Application of the Definition of “OCS Source” to the Discoverer**

**F.2.a Comment:** EPA received numerous comments on its two proposed alternatives for determining when the Discoverer becomes an “OCS source” within the meaning of 40 C.F.R. § 55.2.

**In favor of Option 1:** One group of commenters contends that the relevant statutory provisions and legislative history require that EPA regulate the Discoverer as an OCS source no later than when it makes contact with the seabed by placing its first anchor. In support for this position, such commenters stated:

- To the extent the legislative history of OSCLA requires attachment to the seabed in the case of vessels, the attachment is at most a mere connection. See House Report 95-950 at 128. Thus, Shell’s drillship will be connected to the seabed, and subject to regulation consistent with Section 4(a)(1) of OCSLA, once its first anchor is positioned. EPA should apply its regulation, 40 C.F.R. § 55.2, which by its own terms must be applied “within the meaning” of OSCLA Section 4(a)(1),

in which EPA has authority to regulate air pollutant emissions on the OCS, and attachment of the source to the seabed is a prerequisite. As the Environmental Appeals Board has previously determined, under the plain language of the regulatory definition of OCS source, whether a vessel is attached or detached from the seabed is not only relevant to whether the vessel is or is not an OCS source but would appear to be required by the plain language of the regulatory text. *Kulluk* EAB Decision, slip op. at 26.

#### **F.4 Subcategory - Regulation of Otherwise “Nonroad Engines” as Part of the OCS Source**

**Comment:** One commenter asserts that EPA has improperly imposed stationary source control strategies (e.g. PSD BACT) on vessels and nonroad engines that are not stationary sources and that are not easily configured to meet stationary source emission standards. The commenter states that the Statement of Basis opines that New Source Performance Standards (NSPS) and NESHAPs apply to nonroad engines and other emission units located on vessels, but that EPA defers the imposition of these requirements to a future Title V permit. In support of its position, the commenter asserts that the statutory definition of “stationary source” in CAA Section 302(z) excludes nonroad engines, that the PSD definition of stationary source exempts vessels, that CAA Sections 111 and 112 plainly limit the application of NSPS and NESHAP requirements to stationary sources, and that none of these programs authorize EPA to apply stationary source controls to vessels or nonroad engines. Of particular relevance to the proposed permit, the commenter argues, the PSD program does not authorize EPA to establish BACT limits for nonroad engines or vessels, citing to *In re Cardinal FG Company*, PSD Appeal No. 04-04, EPA Environmental Appeals Board, 2005 WL 701329, \*14 (Mar. 22, 2005). The commenter continues that EPA’s explanation in the Statement of Basis misconstrues the language of Section 328, and ignores a recent decision of the EPA Environmental Appeals Board. After agreeing with EPA that nonroad engines are part of the OCS source and emissions from vessels within 25 miles of the OCS source count as direct emissions from the OCS source for purposes of ambient impact assessment due to the definition of OCS source in CAA Section 328(a)(4)(C), the commenter states that this does not support EPA’s view that any equipment within an OCS source is subject to stationary source controls. The commenter cites to the *Kulluk* EAB Decision, in which the commenter asserts, the EAB, with support from EPA, refused to “override” the jurisdictional boundaries of the PSD program just because the equipment was part of an “OCS Source.” The commenter concludes by stating that EPA has no authority to impose BACT limits on nonroad engines or vessels and that the proposed permit must be revised to delete the approval conditions that impose BACT limits on these categories of equipment.

**Response:** The commenter acknowledges that engines on an OCS source are considered part of the OCS source, but asserts that such engines may not be subject to BACT or other requirements that apply to stationary sources. EPA disagrees. As EPA explained in the Statement of Basis for the proposed permit, the exclusion of nonroad engines from the general definition of “stationary source” in Section 302(z) of the CAA is overridden

by the more specific definition of “OCS source” in Section 328 of the CAA. Statement of Basis, pp. 22-23, citing CAA Section 328(a)(4)(C); see also 40 C.F.R. § 55.2. The OCS source definition states that the OCS source includes “any equipment, activity, or facility which – emits or has the potential to emit any air pollutant,” and specifically includes “drill ship exploration.” Section 328(a)(4)(C). Furthermore, CAA section 328(a)(4)(D) defines the term “new OCS source” to mean “an OCS source which is a new source within the meaning of section [111(a)] of [the CAA].” Inherent in the definition of “new source” under Section 111 is that the source to be regulated is a stationary source. See Section 111(a)(2).

Moreover, the regulatory definition of OCS source in 40 C.F.R. § 55.2 provides that, for vessels physically attached to an OCS facility, “only the stationary source aspects of the vessels will be regulated.” See 40 C.F.R. § 55.2 (definition of OCS source). There would be no point to considering the “stationary source aspects” of a vessel attached to an OCS source to be part of an OCS source in 40 C.F.R. § 55.2 unless “such stationary source aspects” were considered and regulated in some other way than as emissions from vessels within 25 miles of an OCS source because, as the commenter acknowledges, emissions from otherwise nonroad engines on vessels within 25 miles of the OCS source count as direct emissions from the OCS source for purposes of ambient impact assessment. Section 328 of the CAA plainly requires that emission units on OCS sources be regulated as stationary sources except with respect to propulsion engine emissions from vessels attached to an OCS source. Similarly, the exclusion of vessel emissions in 40 C.F.R. § 52.21 in the PSD definition of “stationary source” is plainly overridden by the specific reference to the regulation of vessels as OCS sources in the definition of OCS source in CAA Section 328(a)(4)(C) and 40 C.F.R. § 55.2. Finally, we note that in drafting the OCS provisions of the CAA, Congress specifically indicated that “[t]his legislation is intended to supersede any inconsistent authorities, including, but not limited to, section 5(a)(8) of the [OCSLA].” S. Rep. No. 101-228 at 78 (1989) (emphasis added). Accordingly, we find no basis for the claim that we must limit the OCS provisions as the comment suggests.

Consideration of the emission sources on a typical OCS source make clear that neither Congress nor EPA could have intended to exclude otherwise nonroad engines from regulation as stationary sources if part of an OCS source. Using the Discoverer as an example, under the commenters’ interpretation, only the boilers and the incinerator on the Discoverer would be subject to BACT as part of the “OCS source.” All of the other emission sources on the Discoverer are equipment powered by internal combustion engines, such as diesel electric generators and diesel powered pumps, and would, in the commenters view, be excluded from BACT under the exclusion for “nonroad engines” in Section 302(z) of CAA. Thus, under the commenter’s interpretation, only three of the 32 emission units identified by EPA as part of the OCS source for the Discoverer would be subject to direct regulation under this permit and subject to, for example, BACT.<sup>7</sup>

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<sup>7</sup> In fact, by stating that “vessels and nonroad engines that are not stationary sources,” it appears that commenter may actually be arguing that not only the nonroad engines, but the entirety of the nonroad vehicles (aka vessels), should be excluded from OCS regulation. Such an exaggerated interpretation serves to further emphasize that the

Congress's specific grant of authority to EPA in the 1990 CAA amendments to regulate OCS sources, including "drill ship exploration" would be rendered meaningless if emissions from engines that would otherwise be considered nonroad engines and that comprise the vast majority of emission units on drill ships and drilling platforms were excluded from regulation as stationary sources.

We also find the commenter's reliance on the EAB decision in *Shell Offshore Inc., Kulluk Drilling Unit and Frontier Discoverer Drilling Unit, Order Denying Review In Part and Remanding In Part*, 13 E.A.D. \_\_ (September 14, 2007) to be misplaced. In that case, the EAB was trying to determine if EPA had properly considered vessel emissions in determining the PTE of the OCS source for PSD applicability purposes and was specifically responding to the petitioners' claim that EPA should have considered emissions produced while the vessels were in transit from one drill site to another. Thus, the EAB was specifically focused on the PSD definition of "stationary source" to determine PSD applicability when the ship was in transit. The Board upheld EPA's PTE determination, which included emissions from otherwise nonroad engines when the vessels were not in transit between drill sites and were instead considered an OCS source, and nothing in the court's language suggests that those emissions, and thus the otherwise nonroad engines they came from, should have been excluded from the PSD definition of "stationary source." In fact, the court rejected one argument from the petitioners in that case by finding that the PSD "stationary source" in the permit at issue did not exclude any emissions units that comprised the "OCS source" identified in permit. *See id.* at 33-34 and n. 30. Accordingly, we find that neither the relevant statutory and regulatory provisions nor the EAB's prior decision dictate that the nonroad engines addressed in this permit should not be subject to PSD permitting requirements, including BACT controls.

## **G CATEGORY - REGULATION OF ASSOCIATED FLEET AS PART OF OCS SOURCE**

### **G.1 Subcategory - Associated Fleet and BACT**

**G.1.a Comment:** Commenters assert that, by requiring best available control technology (BACT) only for the drill ship and a single supply vessel, EPA is leaving the majority of the Discoverer's fleet and potentially thousands of tons of pollutants free from meaningful regulation. The commenters continue that Shell's icebreakers and support vessels will emit the lion's share of pollution from Shell's proposed drilling operations, including 96% of the operations' total NO<sub>x</sub> emissions and 92% of their total PM<sub>2.5</sub> emissions. The commenters also state that emissions from the Discoverer's propulsion engine are not calculated and were not considered in the draft permit and have yet to be calculated. The commenters contend that both the statutory definition of "OCS source" as well as the legislative history of Section 328 evince Congress's intent to count emissions

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reading suggested by the commenter would strip the OCS regulations of all ability to control air emissions from the "drill ship exploration" that Congress clearly intended to regulate. See CAA § 328(a)(4)(C).



from marine vessels servicing or associated with an OCS source not solely for the purposes of potential to emit calculations and determining whether the source is subject to PSD, but also as “direct emissions of the OCS source” and for the “purposes of regulation” under PSD, including the BACT requirement. The commenters further assert that, although EPA’s regulations define an “OCS source” to exclude associated and servicing vessels, the OCS regulations do not preclude the application of BACT to emissions from the associated vessels. The commenters continue that it is critical that emissions that can be regulated under the CAA are subject to regulation now, because this permit will set the bar for the myriad of other offshore oil and gas exploration activities in the future and Shell’s permit demonstrates the incredibly significant impact just one operator can have on air quality in the Arctic.

**Response:** Under the regulatory definition of “OCS source,” only vessels that are “attached to the seabed and erected thereon and used for the purpose of exploring, developing, or producing resources therefrom...” or that are attached to an OCS facility are considered an OCS source and subject to regulation as stationary sources under the PSD program. EPA was challenged on this precise issue in *Santa Barbara County Air Pollution Control Dist. v. EPA*, 31 F.3d 1179, 1181 (D.C. Cir. 1994), and the OCS regulations were upheld. The OCS regulations make clear that, although the emissions from a vessel servicing an OCS source and within 25 miles of the OCS source are not regulated as part of the OCS source, emissions from such vessels are considered to be emissions from the OCS source and thus are considered in the ambient air quality impact analysis and offset calculations. 57 Fed. Reg. at 40794. Although this permit does not impose BACT on emission units that comprise the Associated Fleet, except for the supply vessels when attached to the Discoverer and the Discoverer is an OCS source, the permit does limit emissions from the Associated Fleet to ensure that the potential emissions of the OCS source do not cause or contribute to a violation of the NAAQS or violate increment.

**G.1.b Comment:** EPA’s application of the term “OCS source” in the Shell permit is also inconsistent with the agency’s administration of the PSD program as a whole. In its PSD regulations, EPA defines a “stationary source” –i.e., one that is subject to regulation under the program—as “any building, structure, facility or installation,” which in turn is defined as “all of the pollutant emissions activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, are under the control of the same person (or persons under common control).” 40 C.F.R. § 52.21. This is an incredibly broad interpretation of activities that are covered under the PSD program and, under these definitions, EPA has determined that facilities a mile or more apart are the same source for purposes of the PSD program. It is arbitrary for EPA to implement the PSD program broadly on shore, while narrowing the same program significantly when the activities are occurring offshore. This approach is also contrary to Congressional intent that OCS sources comply with the same requirements as non-OCS sources.

**Response:** Although EPA agrees that “stationary source” is defined very broadly under the PSD regulations, EPA disagrees that its interpretation of the OCS source in the Shell permit is inconsistent with EPA’s administration of the PSD program as a whole. To the contrary, as discussed in the preamble to the final OCS regulations, EPA’s determination that a vessel is to be regulated as part of the stationary source only when it is attached to an OCS source “is consistent with federal New Source Review (“NSR”) requirements [including PSD] under which emissions from the stationary source activities of vessels *at dockside* are considered primary emissions of the marine terminal and are regulated as such.” 57 Fed. Reg. at 49793 (emphasis added). Under PSD, vessels at sea that are en route to a marine terminal are not regulated as part of the marine terminal stationary source.

## **G.2 Subcategory - Icebreaker #2 and BACT**

**G.2.a Comment:** Commenters assert that even if EPA were to apply BACT requirements only to vessels directly or indirectly attached to the sea-bottom as proposed, EPA should nevertheless apply BACT to the anchor-handling vessel (Icebreaker #2) because, like the supply ship, Icebreaker #2 will be attached to the bottom via attachment to the drillship. Commenters disagree with EPA’s proposed determination that Icebreaker #2 is not “physically attached” to the Discoverer on the grounds that the anchor line running between the vessels was not designed “to fasten . . . ” or “to connect . . . ” within the plain meaning of the term. Instead, the commenters assert, regardless of the anchor line’s design or intent, the anchor line in fact physically connects the vessels during the anchoring process and that Icebreaker #2 therefore falls within the plain meaning of “attached” and thus within the meaning of OCS source.

**Response:** Little, if any, anchor handling will occur while the Discoverer is an OCS source because, as discussed in response to Comment F.2, EPA has determined that the Discoverer is not an OCS source until it is sufficiently secure and stable to commence

drilling operation. At this point, most, if not all anchoring setting will have been completed.

In any event, EPA continues to believe that Icebreaker # 2 is not “permanently or temporarily attached” to the Discoverer during the time it is assisting the Discoverer in the anchor setting and retrieval process at a drill site. Statement of Basis. p. 21, fn. 7. The purpose of “attachment” within the definition of “OCS source” in 40 C.F.R. § 55.2 is to prevent or minimize relative movement between two vessels, between a vessel and a dock structure, or between a vessel and the seabed. See 57 Fed. Reg. 40,792, 40,793-94 (Sept. 4, 1992) (referencing activities of vessels while “at dockside”). In this instance it is clear that the anchor cable, which is repeatedly connected and disconnected from one of the Discoverer’s eight anchors, is not intended in any way to restrict the location of Icebreaker #2. In fact, the anchor cable will be played out as Icebreaker # 2 travels away from the Discoverer. Icebreaker #2 is merely transporting the anchor and the end of the anchor cable to the designated anchor site. EPA does not believe this constitutes “attachment” as used in the definition of OCS source. Additionally, even if Icebreaker #2 is considered attached to the Discoverer during the anchor setting and retrieval process via its anchor line, Icebreaker # 2 is not performing stationary source activities at this time, and only such activities are considered an OCS source in the case of a vessel that becomes an OCS source through a permanent or temporary attachment to an OCS facility. See 40 C.F.R. § 55.2 (definition of OCS source).

### **G.3 Subcategory - Propulsion Engine and BACT**

**G.3.a Comment:** Commenters state that the statutory definition of “OCS source” includes the Discoverer’s propulsion engine as the ship moves within the 25-mile radius of the drill site because it is equipment that emits air pollutants, is authorized under OSCLA, and is located on the OCS or in or on waters of the OCS and further state that the legislative history of CAA Section 328 confirms that air emissions associated with stationary and in-transit activities of the vessels will be included as part of the facility’s emissions for vessel activities within a radius of 25 miles of the exploration, construction, development or production location. The commenters continue that Congress explicitly listed drillship exploration as an example of an activity that falls within the definition of OCS source, and drillship exploration inherently includes the uses of propulsion engines for reaching the drill site and maneuvering to place the ship’s anchors. Thus, commenters state, EPA improperly exempted the emissions from the Discoverer’s propulsion engine in the PTE calculation and failed to conduct a BACT analysis for this source. The commenters contend that the propulsion engine is a major contributor of air pollutants given the size of the engine and that Shell has estimated that bringing the Discoverer into and out of the 25-mile radius of a drill site would result in the addition of half a ton of NO<sub>x</sub> to Shell’s overall emissions.

**Response:** EPA’s authority to regulate pollutant emissions under Section 328 and 40 C.F.R. Part 55 is limited to emissions from the “OCS source.” The permit prohibits the use of the propulsion engine when the Discoverer is an OCS source. See Permit

Condition D.1. There will thus be no emissions from the propulsion engine while the Discoverer is an OCS source.

EPA notes that in issuing a minor source (i.e., non-PSD) OCS permit for operation of the Discoverer in the Beaufort Sea in 2007, EPA stated that “Emissions from the Discoverer and support vessels within a 25-mile radius of a drill site are considered in determining the Discoverer’s potential to emit (PTE) as if the Discoverer were already located at the drill site.” Air Quality Control Minor Permit No. R10OCS-AK-07-02, Approval to Construct, Shell Offshore, Inc. Frontier Discoverer Drilling Unit, dated March 30, 2007, p. 9. The same is true for the minor OCS permit issued by EPA in 2007 for Shell’s operation of the Kulluk drilling rig in the Beaufort Sea and then reissued after a remand from the Environmental Appeals Board in 2008. Air Quality Control Minor Permit No. R10OCS-AK-07-012, Approval to Construct, Shell Offshore, Inc. Kulluk Drilling Unit, dated March 30, 2007. In its review of these permits, the Environmental Appeals Board specifically noted this aspect of EPA’s permit decisions and found that “the Region’s determination of the OCS source, and the methodology it used for allocating emissions of support vessels in calculating the source’s “potential to emit,” to be reasonable and consistent with EPA’s statements made when promulgating the OCS air regulations.” *Kulluk* EAB Decision, slip op. at 30-31, fn. 26. Shell subsequently requested that EPA suspend permitting activity on the minor source permit for the Discoverer in the Beaufort Sea after the permit was challenged and then remanded to EPA by the Environmental Appeals Board for further consideration. In addition, Shell subsequently withdrew its application for an OCS permit for the Kulluk drilling vessel in the Beaufort Sea and EPA therefore terminated the permit before it was finalized. See Public Notice, “EPA Terminates Minor Source Air Permitting Activity for Shell Kulluk,” April 24, 2009. [http://yosemite.epa.gov/R10/airpage.nsf/Permits/ocs\\_kulluk\\_terminated\\_ap/\\$FILE/shell\\_kulluk\\_publicnotice042409.pdf](http://yosemite.epa.gov/R10/airpage.nsf/Permits/ocs_kulluk_terminated_ap/$FILE/shell_kulluk_publicnotice042409.pdf)

After further consideration of EPA’s approach in the minor source OCS permits for the Discoverer and the Kulluk in 2007 and 2008 that were never finalized, EPA concludes that it erred in considering emissions from the Discoverer en route to and within a 25-mile radius of a drill site in determining the Discoverer’s PTE as if the Discoverer were already located at the drill site and an “OCS source.” The language in CAA Section 328(a)(1) discussing the emissions of the OCS source states that “[f]or purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or en route to or from the OCS source while within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.” (emphasis added). Similarly, EPA’s definition of “potential emissions” at 40 C.F.R. § 55.2 provides that “[p]ursuant to section 328 of the Act, emissions from vessels servicing or associated with an OCS source shall be considered direct emissions from such a source while at the source, and while en route to or from the source when within 25 miles of the source, and shall be included in the “potential to emit” for an OCS source....” (emphasis added). Notably, neither of these regulatory definitions make reference to the “drill site,” but instead discuss what emissions should be considered only with reference to the “OCS source.” As explained above, EPA’s position is that before the Discoverer is “attached to the seabed and erected thereon and used for the purpose of exploring, developing, or producing resources therefrom,” there is no OCS source. See

response to Comment 5.2.b. Therefore, it is not possible to be “within 25 miles of an OCS source,” and the propulsion engine emissions prior to this time are not counted. EPA therefore concludes that emissions from the propulsion engine of the Discoverer are not to be considered in the PTE of the OCS source while en route to and within 25 miles of the drill site, a period of approximately four hours, or while en route from one drill site to its next drilling location, which may be less than 25 miles away, because there is no longer an “OCS source” at this time.<sup>8</sup> Shell has estimated that the four hour trip during which the Discoverer is within 25 miles of the drill site to which it is going results in emissions of approximately ½ ton of NO<sub>x</sub>.

#### **G.4 Subcategory - Nanuq and BACT**

**G.4.a Comment:** Commenters contend that EPA has misapplied its own approach of not applying BACT to support vessels because EPA excludes the vessel Shell will use to refuel the Discoverer, likely the Nanuq, from its BACT requirement. Commenters contend that the Nanuq will be attached to the Discoverer and may be part of the OCS source during refueling, and therefore should be subject to BACT even under EPA’s approach. Commenters continue that when engaged in refueling, the Nanuq, or other refueling vessel, will be performing an activity that directly serves the Discoverer and would be in a position analogous to a vessel dockside at a marine terminal. Thus, commenters contend, EPA should regulate the refueling vessel as part of the OCS source during refueling and subject it to BACT requirements.

**Response:** Permit Condition Q.6 prohibits attachment of the Nanuq or the Kvichak work boats to the Discoverer while the Discoverer is an OCS source. Thus, the Nanuq will not be permitted to be refueled by and attached to the Discoverer, or to refuel the Discoverer while the Discoverer is an OCS source. In addition, Permit Condition 8.B prohibits the refueling of the Discoverer while the Discoverer is an OCS source.

#### **G.5 Subcategory - Vessels not Performing Stationary Source Activities**

**G.5.a Comment:** A commenter states that several conditions of the draft permit limit the operations of vessels to prevent them from being classified as part of the OCS source, pointing to conditions that prohibit attachment of some vessels in the Associated Fleet to the Discoverer. The commenter asserts that these restrictions should be deleted because they are based on a misreading of the 40 C.F.R. Part 55 definition of OCS Source that overlooks the proviso in the regulation stating that, when vessels attach to the Discoverer “only the stationary source aspects of the vessels will be regulated” and that this limitation derives directly from the D.C.

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<sup>8</sup> EPA notes that, although the Environmental Appeals Board appears to have concluded that EPA’s position on this issue in the 2007 and 2008 non-PSD OCS permits “to be reasonable and consistent with EPA’s statements made when promulgating the OCS air regulations,” *Kulluk* EAB Decision, p. 30, this position appears to be inconsistent with the EAB’s rejection of the petitioners’ claim that the “OCS source” within the meaning of CAA section 328 and 40 C.F.R. § 55.2 is the drill ship wherever it travels on the OCS.

\*\*\* ANNOUNCEMENT \*\*\*

FINAL DECISION TO ISSUE AN OCS/PSD PERMIT  
TO SHELL GULF OF MEXICO INC. FOR  
EXPLORATORY DRILLING OPERATIONS IN THE CHUKCHI SEA

On January 8, 2010, the Region 10 office of the United States Environmental Protection Agency (EPA) requested public comment on a proposal to issue an Outer Continental Shelf (OCS)/Prevention of Significant Deterioration (PSD) permit to Shell Gulf of Mexico, Inc. (Shell). The proposed permit would authorize Shell to conduct a multi-year exploratory oil and gas drilling program with the Frontier Discoverer drillship and support fleet on Shell's current leases in Lease Sale 193 on the Chukchi Sea outer continental shelf more than 25 miles beyond the State of Alaska's seaward boundary.

During the public comment period on the proposed permit, which ended on February 17, 2010, EPA received numerous written and oral comments regarding the project. EPA has carefully reviewed each of the comments submitted and, after consideration of the expressed view of all interested persons, the pertinent federal statutes and regulations, and additional material relevant to the application and contained in the administrative record, EPA has made a decision in accordance with 40 CFR 52.21 and 40 CFR Part 55 to issue a final OCS/PSD permit to Shell.

The final permit, EPA's responses to the public comments, and additional supporting information are available online at <http://yosemite.epa.gov/R10/airpage.nsf/Permits/chukchiap> Copies of the final permit and EPA's responses to the comments are also available upon request in writing, or by fax to:

U.S. Environmental Protection Agency  
Office of Air, Waste and Toxics (AWT-107)  
Attn: Janis Hastings  
1200 Sixth Avenue, Suite 900  
Seattle, WA 98101-3140

Fax: 206-553-2955

Copies of the final permit and EPA's responses to the public comments are also available for inspection during normal business hours at the locations on the attached list.

Any person who filed comments on the proposed permit or participated in the public hearing may petition the Environmental Appeals Board (EAB) by May 3, 2010 to review any condition of the final permit. Others may petition for review only to the extent of the changes from the proposed to final permit. The petition must include a statement of the reasons for requesting review by the EAB including a demonstration that any issues being raised were raised during the public comment period (including any public hearing) and, when appropriate, a showing that the conditions in question are based on 1) a finding of fact or conclusion of law which is erroneous, or 2) an exercise of discretion or an

important policy consideration which the EAB should, in its discretion, review. Any person who failed to file comments or failed to participate in the public hearing on the draft permit may petition for administrative review only to the extent of the changes from the proposed permit to the final permit decision. The petitions must be received at the EAB no later than May 3, 2010.

The address for the EAB depends on the method of delivery, as follows:

<b>Method of Delivery</b>	
All documents that are sent through the U.S. Postal Service (except by Express Mail)	Documents that are hand-carried in person, delivered via courier, mailed by Express Mail, or delivered by a non-U.S. Postal Service carrier (e.g., Federal Express or UPS)
<b>Address for Petitions</b>	
U.S. Environmental Protection Agency Clerk of the Board, Environmental Appeals Board (MC 1103B) Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, D.C. 20460-0001	U.S. Environmental Protection Agency Clerk of the Board, Environmental Appeals Board Colorado Building 1341 G Street, N.W., Suite 600 Washington, D.C. 20005

**IMPORTANT NOTE:** Documents that are sent to the EAB's hand-delivery address through the U.S. Postal Service (except by Express Mail) will be returned to the sender and shall not be considered as filed.

Please see 40 CFR 124.19 and visit <http://www.epa.gov/eab/> for more information regarding the procedure for appeals to the EAB, including instructions for electronic filing.

Please bring this announcement to the attention of all persons who you know would be interested in this matter.

\*\*\* END OF ANNOUNCEMENT \*\*\*

Issued March 31, 2010

Copies of the final permit and EPA's responses to the public comments have been sent to the following locations for inspection by the public during normal business hours. If you wish to view the documents at any of these locations, EPA recommends that you first contact the appropriate organization in advance to check the business hours and make any necessary arrangements.

Address: Barrow City Office, 2022 Ahkovak Street, Barrow, Alaska  
Telephone: 907-852-4050

Address: Wainwright City Office, 1217 Airport Road, Wainwright, Alaska  
Telephone: 907-763-2815

Address: Atkasuk City Office, 5010 Ekosik Street, Atkasuk, Alaska  
Telephone: 907-633-6811

Address: Kali School Library, 1029 Ugrak Ave., Point Lay, Alaska  
Telephone: 907-833-2311

Address: Point Hope City Office, 530 Natchiq Street, Point Hope, Alaska  
Telephone: 907-368-2537

Address: EPA Alaska Office, Federal Building, 222 West 7<sup>th</sup> Ave., #19  
Anchorage, Alaska  
Telephone: 907-271-5083



\*\*\* ANNOUNCEMENT \*\*\*

FINAL DECISION TO ISSUE AN OCS/PSD PERMIT  
TO SHELL OFFSHORE INC. FOR  
EXPLORATORY DRILLING OPERATIONS IN THE BEAUFORT SEA

On February 17, 2010, the Region 10 office of the United States Environmental Protection Agency (EPA) requested public comment on a proposal to issue an Outer Continental Shelf (OCS)/Prevention of Significant Deterioration (PSD) permit to Shell Offshore, Inc. (Shell). The proposed permit would authorize Shell to conduct a multi-year exploratory oil and gas drilling program with the Frontier Discoverer drillship and support fleet on Shell's current leases in Lease Sales 195 and 202 on the Beaufort Sea OCS, within and beyond 25 miles of the State of Alaska's seaward boundary.

During the public comment period on the proposed permit, which ended on March 22, 2010, EPA received numerous written and oral comments regarding the project. EPA has carefully reviewed each of the comments submitted and, after consideration of the expressed view of all interested persons, the pertinent federal statutes and regulations, and additional material relevant to the application and contained in the administrative record, EPA has made a decision in accordance with 40 CFR 52.21 and 40 CFR Part 55 to issue a final OCS/PSD permit to Shell.

The application, final permit, EPA's responses to the public comments, and additional supporting information are available online at:

<http://yosemite.epa.gov/R10/airpage.nsf/Permits/beaufortap/>

Copies of the final permit and EPA's responses to the comments are also available upon request in writing, or by fax to:

U.S. Environmental Protection Agency  
Office of Air, Waste and Toxics (AWT-107)  
Attn: Janis Hastings  
1200 Sixth Avenue, Suite 900  
Seattle, WA 98101-3140

Fax: 206-553-2955

Copies of the final permit and EPA's responses to the public comments are also available for inspection during normal business hours at the locations on the attached list.

Any person who filed comments on the proposed permit or participated in the public hearing may petition the Environmental Appeals Board (EAB) by May 12, 2010 to review any condition of the final permit. Others may petition for review only to the extent of the changes from the proposed to final permit. The petition must include a statement of the reasons for requesting review by the EAB including a demonstration that any issues being raised were raised during the public comment period (including any public hearing)

and, when appropriate, a showing that the conditions in question are based on 1) a finding of fact or conclusion of law which is erroneous, or 2) an exercise of discretion or an important policy consideration which the EAB should, in its discretion, review. Any person who failed to file comments or failed to participate in the public hearing on the draft permit may petition for administrative review only to the extent of the changes from the proposed permit to the final permit decision. The petitions must be received at the EAB no later than May 12, 2010.

The address for the EAB depends on the method of delivery, as follows:

<b>Method of Delivery</b>	
All documents that are sent through the U.S. Postal Service (except by Express Mail)	Documents that are hand-carried in person, delivered via courier, mailed by Express Mail, or delivered by a non-U.S. Postal Service carrier (e.g., Federal Express or UPS)
<b>Address for Petitions</b>	
U.S. Environmental Protection Agency Clerk of the Board, Environmental Appeals Board (MC 1103B) Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, D.C. 20460-0001	U.S. Environmental Protection Agency Clerk of the Board, Environmental Appeals Board Colorado Building 1341 G Street, N.W., Suite 600 Washington, D.C. 20005

**IMPORTANT NOTE:** Documents that are sent to the EAB's hand-delivery address through the U.S. Postal Service (except by Express Mail) will be returned to the sender and shall not be considered as filed.

Please see 40 CFR 124.19 and visit <http://www.epa.gov/eab/> for more information regarding the procedure for appeals to the EAB, including instructions for electronic filing.

Please bring this announcement to the attention of all persons who you know would be interested in this matter.

\*\*\* END OF ANNOUNCEMENT \*\*\*

Issued April 9, 2010

Copies of the final permit and EPA's responses to the public comments have been sent to the following locations for inspection by the public during normal business hours. If you wish to view the documents at any of these locations, EPA recommends that you first contact the appropriate organization in advance to check the business hours and make any necessary arrangements.

Address: Kaktovik City Office, 2051 Barter Avenue, Kaktovik, Alaska  
Telephone: 907-640-6313

Address: Nuiqsut City Office, 2230 2<sup>nd</sup> Avenue, Nuiqsut, Alaska  
Telephone: 907-480-6727

Address: Barrow City Office, 2022 Ahkovak Street, Barrow, Alaska  
Telephone: 907-852-4050

Address: EPA Alaska Office, Federal Building, 222 West 7<sup>th</sup> Ave., #19  
Anchorage, Alaska  
Telephone: 907-271-5083