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: September 19, 2011

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

is authorized to construct and operate the Noble Discoverer (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 (EPA) and citizens under the CAA.

_____/S/_____ ___09/19/2011_____
Richard Albright Date
Director, Office of Air, Waste and Toxics

TABLE OF CONTENTS

List of Tables

ABBREVIATIONS AND ACRONYMS

AAC .....Alaska Administrative Code
BACT. .....Best Available Control Technology
CAA .....Clean Air Act
CDPF.....Catalyzed Diesel Particulate Filter
CFR. .....Code of Federal Regulations
CGA. .....Cylinder Gas Audit
COA .....Corresponding Onshore Area
CTM.....Conditional Test Method
CMS .....Continuous Monitoring Systems
EPA.....United States Environmental Protection Agency
HPU.....Hydraulic Power Unit
MLC .....Mud Line Cellar
NA.....Not applicable
OCS.....Outer Continental Shelf
OTM.....Other Test Method
PDF .....Portable Document Format
PSD .....Prevention of Significant Deterioration
QA.....Quality Assurance
QC .....Quality Control
SCR.....Selective Catalytic Reduction
USCG.....United States Coast Guard

UNITS AND MEASUREMENTS

Btu.....British thermal units
^{o}C.....degree Celsius
dscf.....dry standard cubic foot
^{o}F .....degree Fahrenheit
g.....grams
hp.....brake horsepower
hr .....hour
kW.....kiloWatts (mechanical)
kWe.....kiloWatts electrical
lb .....pounds
MMBtu/hr .....Million British thermal units per hour
ppm .....parts per million
ppmv .....parts per million by volume
scf.....standard cubic foot
tpy .....tons per year

POLLUTANTS

CO .....Carbon Monoxide
CO_2e.....Carbon Dioxide Equivalent
GHG or GHGs .....Greenhouse Gas or Greenhouse Gases
NH_3 .....Ammonia
NMHC.....Non-Methane Hydrocarbons
NO_X.....Oxides of Nitrogen
NO_2 .....Nitrogen Dioxide
PM.....Particulate Matter
$PM_{2.5}$ .....Particulate Matter with an Aerodynamic Diameter less than 2.5 microns
PM_{10} .....Particulate Matter with an Aerodynamic Diameter less than 10 microns
SO_2 .....Sulfur Dioxide
VOC .....Volatile Organic Compound

AUTHORITY

The United States Environmental Protection Agency (EPA) is issuing this outer continental shelf (OCS)/prevention of significant deterioration (PSD) permit pursuant to Section 328 of the CAA, 42 U.S.C. § 7627, and the implementing OCS regulations at 40 CFR Part 55, and pursuant to Part C to Title I of the CAA, 42 U.S.C §§ 7470 to 7492, and the implementing PSD air quality regulations at 40 CFR § 52.21. This action is based upon the application submitted by Shell Offshore Inc. (Shell or permittee) on January 18, 2010, supplemental submittals identified in the administrative record for this permit action, and upon the technical analysis performed by the EPA.

In addition the EPA is issuing this OCS/PSD permit consistent with Article 3 of the State of Alaska Air Quality Control Regulations 18 Alaska Administrative Code (AAC) 50.302 (Construction Permits), and 18 AAC 50.306 (Prevention of Significant Deterioration Permits), the applicable provisions of which have been incorporated into 40 CFR Part 55 Appendix A.

FINDINGS

On the basis of the information in the administrative record, the EPA has determined that:

1. The permittee will meet all of the applicable requirements of the 40 CFR Part 55.
2. The permittee will meet all of the applicable requirements of the 40 CFR § 52.21.
3. The permittee will meet all of the applicable requirements of 18 AAC 50.

APPROVAL CONDITIONS

Shell is authorized to construct and operate the vessels and emission units listed in Tables 1 through 6, at any of the lease blocks identified on Page 1 of this permit, and consistent with the representations in the permit application and subject to the conditions in this permit.

Coast Guard Safety Zone. The permit does not authorize operation unless:

a. The Discoverer is subject to a currently effective safety zone established by the United Sates Coast Guard (USCG) which encompasses an area within at least 500 meters from the center point of the Discoverer and which prohibits members of the public from entering this area except for attending vessels or vessels authorized by the USGC (such area shall be referred to as the "Safety Zone"); and

b. Shell has developed in writing and is implementing a public access control program to:

- locate, identify, and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the Safety Zone; and
- communicate to the North Slope communities on a periodic basis when exploration activities are expected to begin and end at a drill site, the location of the drill site, and any restrictions on activities in the vicinity of Shell's exploration operations.

Table:1 – Noble Discoverer Emission Units

ID	Description	Make and Model	Rating[a]
FD-1 – 6	Generator Engines	Caterpillar D399 SCAC 1200 rpm	1,325 hp
FD-7	Propulsion Engine	Mitsubishi 6UEC65	7,200 hp
FD-8	Emergency Generator Seldom Used Sources	Caterpillar 3412 Various	639 hp Various[b]
FD-9 – 11	MLC Compressor Engines	Caterpillar C-15	540 hp
FD-12 – 13	HPU Engines	To be determined	250 hp
FD-14	Port Deck Crane Engine	Caterpillar D343	365 hp
FD-15	Starboard Deck Crane Engine	Caterpillar D343	365 hp
FD-16 – 17	Cementing Unit Engines	Detroit 8V-71N	335 hp
FD-18	Cementing Unit Engine	GM 3-71	147 hp
FD-19	Logging Winch Engine	Caterpillar C7	250 hp
FD-20	Logging Winch Engine	John Deere PE4020TF270D	35 hp
FD-21 – 22	Heat Boilers	Clayton 200	7.97 MMBtu/hr
FD-23	Incinerator	TeamTec GS500C	276 lb/hr
FD-24 -30	Fuel Tanks	Not applicable (NA)	Various
FD-31	Supply Ship Generator Engine(s)[c]	Generic	584 hp
FD-32	Drilling Mud System	NA	NA
FD-33	Shallow Gas Diverter System[d]	NA	NA
FD-34	Cuttings/Mud Disposal Barge[e]	NA	NA

[a] Permit conditions may limit operation to less than rated capacity.

[b] See Condition E.3 for the Discoverer Emergency Generator and Seldom Used Sources (Unit FD-8) aggregate fuel use limit.

[c] Only when attached to the Discoverer.

[d] Permit conditions prohibit the shallow gas diverter system from emitting any air pollutants.

[e] Permit conditions prohibit fuel combustion sources from being operated on the cuttings/mud disposal barge.

Table:2 – Icebreaker #1

Description	Make and Model	Maximum Aggregate Rating[a]
Aggregate of Propulsion Engines and Generator Engines	Various	31,200 hp
Generator Engine(s)	Various	2,800 hp
Heat Boiler(s)	Various	10 MMBtu/hr
Incinerator	Various	154 lbs/hr
Seldom Used Sources	Various	Various[b]

[a] Permit conditions may limit operation to less than rated capacity.

[b] See Condition O.9.3 for the Icebreaker #1 Seldom Used Sources aggregate fuel use limit.

Table:3 – Icebreaker #2

ID	Description	Make and Model	Rating[a]
Tor Viking			
TV-1 - 2	Main Propulsion Engines	Caterpillar MaK 8M32	5,046 hp
TV-3 - 4	Main Propulsion Engines	Caterpillar MaK 6M32	3,784 hp
TV-5 – 6	Non-propulsion Generator Engines	Caterpillar 3412	1,168 hp
TV-7	Heat Boiler	NA	1.37 MMBtu/hr
TV-8	Incinerator	NA	151 lb/hr
	Seldom Used Sources	Various	Various[b]
Hull 247[c]			
	Main Engines	NA	24 MW[d]
	Heat Boiler	NA	4 MMBtu/hr
	Incinerator	NA	151 lb/hr
	Seldom Used Sources	Various	Various[b]

[a] Permit conditions may limit operation to less than rated capacity.

[b] See Condition P.9.5 for the Icebreaker #2 Seldom Used Sources aggregate fuel use limit.

[c] Hull 247 is the shipbuilder's (Edison Chouest) designation for a vessel to be built under contract to Shell. The final name for the vessel may be different than this temporary designation.

[d] This represents an aggregate rating of all engines on board Hull 247.

Table:4 – Supply Ship/Barge and Tug

Description	Make and Model	Maximum Aggregate Rating[a]
Propulsion Engines and Non-Propulsion Generator Engine(s) Excluding Emergency Engine	Various	Various[b]
Emergency Engine(s)	Various	Various

[a] Permit conditions may limit operation to less than rated capacity.

[b] See Condition Q.1 for the Supply Ship/barge and Tug aggregate fuel limit.

Table:5 – Oil Spill Response Fleet

ID	Description	Make and Model	Rating[a]
Offshore Management Ship - Point Class Tug			
PBT-1 – 2	Propulsion Engines	Caterpillar 3512	1050 hp
PBT-3 – 4	Non-propulsion Generator Engines	Caterpillar 3304	150 hp
	Seldom Used Sources	Various	Various [b]
Skimmer - Arctic Endeavor Barge			
AEB-1 –4	Non-propulsion Generator Engines	Various	556 hp
Oil Spill Response Ship – Nanuq			
N-1 - 2	Propulsion Engines	Caterpillar 3608	2,710 kW
N-3 – 4	Non-propulsion Electrical Generators	Caterpillar 3508	1,285 hp
N-5	Emergency Generator	John Deere	166 kW
N-6	Incinerator	ASC/CP100	125 lbs/hr
	Seldom Used Sources	Various	Various [b]
Oil Spill Response Work Boat - Kvichak 34-foot No. 1			
K-1 – 2	Propulsion Engines	Cummins QSB	300 hp
K-3	Generator Engines	Various	12 hp
Oil Spill Response Work Boat - Kvichak 34-foot No. 2			
K-4 – 5	Propulsion Engines	Cummins QSB	300 hp
K-6	Generator Engines	Various	12 hp
Oil Spill Response Work Boat - Kvichak 34-foot No. 3			
K-7 – 8	Propulsion Engines	Cummins QSB	300 hp
K-9	Generator Engines	Various	12 hp
Oil Spill Response Skimmer - Rozema 47-foot			
R-1 –2	Propulsion Engines	Various	700 hp
R-3	Generator Engines	N/A	9 hp

[a] Permit conditions may limit operation to less than rated capacity.

[b] See Condition R.5 for the Nanuq and Point Class Tug Seldom Used Sources aggregate fuel use limit.

Table:6 – Cuttings/Muds Disposal Barge and Tug

ID	Description	Make and Model	Rating
Cuttings/Mud Disposal Barge[a]			
	Non-propulsion Engine(s)	Not Specified	Not Specified
Tug			
	Propulsion Engine(s)	Not Specified	Not Specified
	Non-propulsion Engine(s)	Not Specified	Not Specified

[a] The barge itself has no air quality implications since it has no generators or other fuel-burning equipment.

Effective Date. This permit becomes effective 30 days after the service of notice of the final permit decision, unless review of the permit decision is requested pursuant to 40 CFR § 124.19.

OCS Source. Permit conditions contained in Sections B through R, except for those conditions addressing notification, reporting, and testing, apply only during the time that the Discoverer drillship is an OCS Source. Permit conditions in Sections A and S as well as permit conditions contained in Sections B through R addressing notification, reporting, and testing apply at all times as specified.

For the purpose of this permit:

a. The Discoverer is an "OCS Source" at any time the Discoverer is attached to the seabed at a drill site by at least one anchor; and

b. A drill site is any location at which Shell is authorized to operate under this permit and for which Shell has received from the Bureau of Ocean, Energy, Management and Regulatory Enforcement (BOEMRE) an authorization to drill.

Lease Identification. This major source permit authorizes the mobilization and operation of the Discoverer drillship and its associated fleet at various drill sites in the Beaufort Sea OCS off the North Slope of Alaska in connection with an exploratory oil and gas drilling program (exploration drilling program). The proposed permit will allow Shell to operate the Discoverer drillship and associated fleet for a multi-year exploration drilling program within Shell's current lease blocks in lease sales 195 and 202 on the Beaufort Sea OCS. The group of lease blocks authorized under this permit is located within 25 miles and beyond 25 miles from Alaska's seaward boundary. In some instances, lease blocks are both within and beyond 25 miles from Alaska's seaward boundary. For purpose of the Statement of Basis and the proposed permit, the portion of the OCS which is 25 miles or more miles from the State's seaward boundary is referred to as the "Outer OCS". The portion of the OCS that is within 25 miles of the State's seaward boundary is referred to as the "Inner OCS".

The leases can be divided into the three following groups:

- Lease blocks entirely outside 25 miles of Alaska's seaward boundary – 6529, 6308, 6309, 6310, 6359, and 6410.
- Lease blocks with portions both inside and outside 25 miles of Alaska's seaward boundary – 6406, 6407, 6409, 6459, 6460, 6461, and 6512.
- Lease blocks entirely within 25 miles of Alaska's seaward boundary – 6457, 6508, 6510, 6511, 6558, 6559, 6560, 6561, 6562, 6609, 6610, 6611, 6612, 6657, 6658, 6659, 6660, 6662, 6707, 6708, 6709, 6712, 6713, 6757, 6758, 6764, 6814, 6815, 6773, 6774, 6751, 6752, 6822, 6823, 6824, 6801, 6802, 6873, 6874, and 6851.

When the Discoverer drillship and/or its associated fleet is within the Beaufort Sea Inner OCS, the applicable corresponding onshore area (COA) regulations apply. The provisions in this permit that apply only to operations within 25 miles of the state seaward boundary are identified as "COA Regulations". A reference to any AAC provisions in this permit refers to the ACC provisions incorporated into 40 CFR Part 55 (76 Fed. Reg. 37274, June 27, 2011).

COA REGULATIONS: PERMIT DOCUMENTATION

Date	Document Details
January 18, 2010	Shell Offshore Inc. Outer Continental Shelf Pre-Construction Air Permit Application – Noble Discoverer Beaufort Sea Exploration Drilling Program
June 10, 2011	Supplemental Permit Application Materials
June 22, 2011	Shell Alaska Exploratory Drilling Program Air Quality Permit Application Air Quality Modeling Files for Analysis of Anchor Handler Operations During open Water Conditions
June 23, 2011	Greenhouse Gas Calculation Information

A. GENERALLY APPLICABLE REQUIREMENTS

1. **Construction and Operation.** The permittee shall construct and operate the OCS Source and the Associated Fleet in accordance with the application and supporting materials submitted by the permittee as identified in the Statement of Basis and Supplemental Statement of Basis for this permit action and in accordance with this permit. For purposes of this permit, Icebreaker #1, Icebreaker #2, the Supply Ship/Tug and Barge, the Point Class Tug, Arctic Endeavor Barge, Nanuq, Kvichaks Nos. 1-3, Rozema Skimmer, and Cuttings/Mud Disposal Barge and Tug shall collectively be referred to as the "Associated Fleet."

2. **Overlapping Requirements.** When two or more provisions apply to the same emission unit or activity the permittee must comply with both.

3. **Compliance Required.** The permittee shall comply with all applicable requirements of 40 CFR § 52.21, Part 55, 18 AAC 50, and this permit. Failure to do so shall be considered a violation of Sections 111(e) and 165 of the CAA. All enforcement provisions of the CAA, including but not limited to Sections 113, 114, 120, 167, 303, and 304, apply to the permittee.

4. **Compliance with Other Requirements.** This permit does not relieve the permittee of the responsibility to comply fully with applicable provisions of any other requirements under federal law.

5. **Terms to Make Permit Enforceable.** It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.

6. **Notification to Owners, Operators, and Contractors.** The permittee must notify all other owners or operators, contractors, and the subsequent owners or operators associated with emissions from the source of the conditions of this permit.

7. **Expiration of Approval to Construct.** As provided in 40 CFR § 52.21(f)(4), this approval shall become invalid if construction is not commenced within 18 months after the effective date of this permit, construction is discontinued for a period of 18 months, or construction is not completed within a reasonable time. The EPA may extend the 18-month period upon a satisfactory showing that an extension is justified.

8. **Permit Revision, Termination and, Reissuance.** This permit may be revised, terminated, or revoked and reissued by the EPA for cause. Cause exists to revise, terminate, or revoke and reissue this permit under the following circumstances:

    8.1. This permit contains a material mistake;

    8.2. Materially inaccurate statements were made in establishing the terms or conditions of this permit;

8.3. The permittee fails to comply with any material condition of this permit; or

8.4. This permit must be revised, terminated, or revoked and reissued to assure compliance with CAA requirements.

A request by the permittee for modification, revocation, and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

9. **Credible Evidence.** For the purpose of establishing whether or not the permittee has violated or is in violation of any requirement of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the permittee would have been in compliance with applicable requirements if the appropriate performance or reference test or procedure had been performed.

10. **Inspection and Entry.** Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the EPA or an authorized representative to perform the following:

10.1. Enter upon the Discoverer, or any support vessel, in any location where emissions-related activity is conducted, or any location where records must be kept under the conditions of the permit;

10.2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

10.3. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and

10.4. As authorized by the CAA, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

11. **Recordkeeping Requirements**. In addition to the specific recordkeeping requirements contained in the source-wide and emission unit sections of this permit, the permittee shall keep records of required monitoring information that include the following:

11.1. The date, place, and time of sampling or measurements;

11.2. The date(s) analyses were performed;

11.3. The company or entity that performed the analyses;

11.4. The analytical techniques or methods used;

11.5. The results of such analyses;

11.6. The operating conditions as existing at the time of sampling or measurement;

11.7. Copies of all reports and certifications submitted pursuant to this permit; and

11.8. The location where samples were taken.

The permittee shall retain records of all required monitoring data and support information for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records, all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit.

12. **Agency Notifications.** Unless otherwise specified in this permit, any documents required to be submitted under this permit, including reports, test data, monitoring data, notifications, and applications for renewals and permit modifications shall be submitted to:

    OCS/PSD Air Quality Permits

    U.S. EPA - Region 10, AWT-107

    1200 Sixth Avenue, Suite 900

    Seattle, WA 98101

    Facsimile no. 206-553-0110

    Email: R10OCSAirPermits_Reports@epa.gov

13. **Certification.** Any document required to be submitted under this permit shall be certified by a responsible official, as that term is defined in 40 CFR § 71.2, of the permittee as to truth, accuracy, and completeness. Such certification shall state that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

14. **Severability.** The provisions of this permit are severable, and in the event of any challenge to any portion of this permit, or if any portion is held invalid, the remaining permit conditions shall remain valid and in force.

15. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

16. **Information Request.** The permittee shall furnish the EPA, within a reasonable time, any information the EPA requests in writing to determine whether cause exists to modify, revoke and reissue, or terminate the permit or to determine compliance with the permit. Upon request, the permittee shall furnish the EPA with copies of records required to be kept by the permit.

17. **Excess Emission and Permit Deviation Reports.** Except as otherwise provided in this permit, the permittee shall report via fax or email, all emissions or operations that exceed or deviate from the requirements of this permit as follows:

    17.1. As soon as possible after the event commences or is discovered, report:

        17.1.1. Emissions that present a potential threat to human health or safety; and

        17.1.2. Excess emissions that the permittee believes to be unavoidable.

    17.2. Within two working days after the event commenced or was discovered, report an unavoidable emergency, malfunction, or non-routine repair that causes emissions in excess of a technology based emission standard; or any exceedance of an emission limit; or any exceedance of a throughput limit.

17.3. Report all other excess emissions and permit deviations:

17.3.1. Within 30 days after the end of the month during which the emissions or deviation occurred;

17.3.2. If a continuous or recurring excess emissions is not corrected within 48 hours of discovery, within 72 hours of discovery; and

17.3.3. For failure to monitor, as required in other applicable conditions of this permit.

17.4. When reporting excess emissions or permit deviations, the permittee must report using the form contained in Attachment A to this permit. The permittee must provide all information called for by the form.

17.5. If requested by the EPA, the permittee shall provide a more detailed written report as requested to follow up on an excess emissions report.

18. **Operating Reports.** During the life of this permit[1], the permittee shall submit an original and two copies of an Operating Report by March 31 for the preceding calendar year.

18.1. The Operating Report must include all information required to be in Operating Reports by other conditions of this permit.

18.2. If excess emissions or permit deviations that occurred during the reporting period are not reported under Condition A.17, either:

18.2.1. The permittee shall identify:

18.2.1.1. The date of the deviation;

18.2.1.2. The equipment involved;

18.2.1.3. The permit condition affected;

18.2.1.4. A description of the excess emissions or permit deviation; and

18.2.1.5. Any corrective action or preventive measures taken and the date or dates of such actions; or

18.2.2. When excess emissions or permit deviations have already been reported under Condition A.17, the permittee shall cite the date or dates of those reports.

[1] "Life of this permit" is defined as the permit effective date, including any periods of reporting obligations that extend beyond the permit effective date. For example if a permit expires prior to the end of a calendar year, there is still a reporting obligation to provide operating reports for the periods when the permit was in effect.

18.3. The Operating Report must include a listing of emissions monitored which trigger additional testing or monitoring, whether or not the emissions monitored exceed an emission standard. The permittee shall include in the report:

18.3.1. The date of the emissions;

18.3.2. The equipment involved;

18.3.3. The permit condition affected; and

18.3.4. The monitoring result which triggered the additional monitoring.

18.4. The Operating Report must include reports of any required monitoring, including all emission calculations required by the permit.

19. **COA Regulations: Administration Fees.** The permittee shall pay to the EPA all assessed permit administration fees. Administration fee rates are set out in 18 AAC 50.400 and 50.403.

20. **COA Regulations: Assessable Emissions.** The permittee shall pay to the EPA annual emission fees based on the OCS source's (including the Associated Fleet) assessable emissions as determined by the EPA under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410. The EPA will assess fees per ton of each air pollutant that the OCS source emits or has the potential to emit in quantities greater than 10 tons per year (tpy). The quantity for which fees will be assessed is the lesser of:

20.1. The OCS source's (including the Associated Fleet) assessable potential to emit of 576 tpy; or

20.2. The OCS source's (including the Associated Fleet) projected annual rate of emissions that will occur from July 1 to the following June 30, based upon actual annual emissions emitted during the most recent calendar year or another 12 month period approved in writing by the EPA, when demonstrated by:

20.2.1. An enforceable test method described in 18 AAC 50.220;

20.2.2. Material balance calculations;

20.2.3. Emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or

20.2.4. Other methods and calculations approved by the EPA.

21. **COA Regulations: Assessable Emissions Estimates.** Emission fees will be assessed as follows:

21.1. No later than March 31 of each year, the permittee may submit an estimate of the OCS source's assessable emissions to the EPA at the address listed in Condition A.12, Agency Notification. The submittal must include all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so that the EPA can verify the estimates; or

21.2. If no estimate is received on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit set out in Condition A.20.1.

22. **COA Regulations: Annual Compliance Certification.** Each year by March 31 for the preceding calendar year and for reporting periods following the effective date of this permit, the permittee shall compile and submit to the EPA one original and one copy of an annual compliance certification report as follows.

22.1. For each permit term and condition set forth in the permit including terms and conditions for monitoring, reporting, and recordkeeping:

22.1.1. Certify the compliance status over the preceding calendar year consistent with the monitoring required by this permit;

22.1.2. State whether compliance is intermittent or continuous;

22.1.3. Briefly describe each method used to determine the compliance status; and

22.1.4. Notarize the responsible official's signature.

23. **COA Regulations: General Source Test Requirements.**

23.1. **Requested Source Tests.** In addition to any source testing explicitly required by this permit, the permittee shall conduct source testing as requested by the EPA to determine compliance with applicable permit requirements.

23.2. **Operating Conditions.** Unless otherwise specified by an applicable requirement or test method, the permittee shall conduct source testing:

23.2.1. At a point or points that characterize the actual discharge into the ambient air; and

23.2.2. At the maximum rated burning or operating capacity of the source or another rate determined by the EPA to characterize the actual discharge into the ambient air.

23.3. **Reference Test Methods.** The permittee shall use the following as reference test methods when conducting source testing for compliance with this permit.

23.3.1. Source testing for compliance with requirements adopted by reference in 18 AAC 50.040(a) must be conducted in accordance with the methods and procedures specified in 40 CFR 60.

23.3.2. Source testing for compliance with requirements adopted by reference in 18 AAC 50.040(b) must be conducted in accordance with the methods and procedures specified in 40 CFR 61.

23.3.3. Source testing for compliance with requirements adopted by reference in 18 AAC 50.040(c) must be conducted in accordance with the source test methods and procedures specified in 40 CFR 63.

23.3.4. Source testing for the reduction in visibility through the exhaust effluent must be conducted in accordance with the procedures set out in Reference Method 9. The permittee may use the form in Appendix B to record data.

23.3.5. Source testing for emissions of total particulate matter (PM), sulfur compounds, nitrogen compounds, carbon monoxide, lead, volatile organic compounds, fluorides, sulfuric acid mist, municipal waste combustor organics, metals, and acid gases must be conducted in accordance with the methods and procedures specified in 40 CFR 60, Appendix A.

23.3.6. Source testing for emissions of PM_{10} must be conducted in accordance with the procedures specified in 40 CFR 51, Appendix M, Method 201A and 202.

23.3.7. Source testing for emissions of any contaminant may be determined using an alternative method approved by the EPA in accordance with 40 CFR 63 Appendix A, Method 301.

23.4. **Excess Air Requirements.** To determine compliance with this permit, standard exhaust gas volumes must include only the volume of gases formed from the theoretical combustion of fuel, plus the excess air volume normal for the specific source type, corrected to standard conditions (dry gas at 68°F and an absolute pressure of 760 millimeters of mercury).

23.5. **Test Exemption.** The permittee is not required to comply with Conditions B.21.2, when the exhaust is observed for visible emissions.

23.6. **Test Deadline Extension.** The permittee may request an extension to a source test deadline established by the EPA. The permittee may delay a source test beyond the original deadline only if the extension is approved in writing by the EPA's appropriate division director or designee.

23.7. **Particulate Matter Calculation**. In source testing for compliance with the PM standards in Condition B.13, the three-hour average is determined using the average of three one-hour test runs.

B. SOURCE-WIDE REQUIREMENTS

1. **Drill Site Notification.** At least 6 months prior to the Discoverer becoming an OCS Source, the permittee shall notify the EPA via facsimile of the following information.

1.1. The location of the proposed drill site, using coordinates in the following formats:

1.1.1. Latitude and longitude; and

1.1.2. Universal Transverse Mercator grid system.

1.2. The lease block within the Beaufort Sea lease sales 195 or 202 where the drill site is located;

1.3. The proposed date that the Discoverer will become an OCS Source at that drill site;

1.4. Confirmation that emissions from the source would impact no Class I area. The confirmation shall include a description of the legal and factual basis for this determination; and

1.5. Confirmation that emissions from the source would impact no area where an applicable increment was known to be violated. The confirmation shall include a description of the legal and factual basis for this determination.

2. **Duration of Exploration Operations.** The permittee shall only conduct exploration drilling operations in the Beaufort Sea between July 1 and November 30 each year (referred to hereafter as the "drilling season").

2.1. During any drilling season, the permittee shall not operate the Discoverer as an OCS Source in excess of 120 calendar days. Each partial day the Discoverer is operated as an OCS source shall be counted as a calendar day.

2.2. During any drilling season, the permittee shall not conduct any drilling activity in excess of 1,632 hours. Drilling activity is defined as any time when the top drive is engaged and turning the conventional rotary bit and any time when conducting mud line cellar (MLC) activity as defined in Condition B.2.3.

2.3. During any drilling season, the permittee shall not conduct any MLC activity in excess of 480 hours. MLC activity is defined as any time when any MLC compressor engine (Units FD-9 – 11) or HPU engine (Units FD-12 – 13) is operating.

2.4. For each drill site at which the Discoverer operates, the permittee shall record the following:

2.4.1. The location of each drill site, using a modern global positioning system to determine the location. Location shall be recorded by providing coordinates in the following formats:

2.4.1.1. Latitude and longitude, and

2.4.1.2. Universal Transverse Mercator grid system.

2.4.2. The lease block within the Beaufort Sea lease sales 195 or 202 where the drill site is located.

2.4.3. The date and hour that the Discoverer became an OCS Source at that drill site.

2.4.4. The date and hour that the Discoverer ceased to be an OCS Source at that drill site.

2.4.5. For each period of drilling activity except for periods of MLC activity, the permittee shall record the following:

2.4.5.1. The date and hour at which the top drive is first engaged and turning the conventional rotary bit; and

2.4.5.2. The date and hour at which the top drive is disengaged and no longer turning the conventional rotary bit.

2.4.6. For each period of MLC activity the permittee shall record the following:

2.4.6.1. The earlier of the following two points in time; the date and hour in which the first MLC compressor engine (Units FD-9 – 11)

begins operation and the date and hour in which the first HPU engine (Units FD-12 - 13) begins operation; and

2.4.6.2. The later of the following two points in time; the date and hour in which the last MLC compressor engine (Units FD-9 – 11) ceases operation, and the date and hour in which the last HPU engine (Units FD-12 – 13) ceases operation.

2.5. Any time spent drilling a relief well shall be included in the time recorded in Conditions B.2.1.

2.6. By the 10th of each month, the permittee shall calculate and record the following operating parameters for the previous month and a running total for the current drill season or 12-month period, based upon recordkeeping performed pursuant to Conditions B.2.1, B.2.2, and B.2.3:

2.6.1. The number of days the Discoverer operated as an OCS source;

2.6.2. The number of hours of drilling activity; and

2.6.3. The number of hours of MLC activity.

3. **Drilling Season Notification.** Each drilling season, the permittee shall report to the EPA via facsimile the information below, within 3 days of occurrence:

3.1. The date and hour that the Discoverer became an OCS Source at the first drill site of that drilling season; and

3.2. The date and hour that the Discoverer ceased to be an OCS Source at the last drill site of that drilling season.

4. **Global Positioning System.** The permittee shall use a global positioning system on the Discoverer and Associated Fleet (except for the Kvichaks Nos. 1-3 and Rozema Skimmer) as follows:

4.1. Monitor and record the date, time and location of the Discoverer and Associated Fleet when the Discoverer becomes and ceases to be an OCS source.

4.2. Monitor and record the date, time and location when each vessel in the Associated Fleet enters or leaves the 25 mile radius area around the Discoverer.

4.3. Once each hour, monitor and record the date, time, and location of the Discoverer and Associated Fleet.

4.4. Once each hour, monitor and record the date, time, direction the bow of the Discoverer is pointed, and wind direction at the Discoverer.

5. **Best Available Control Technology (BACT) for Sulfur Dioxide (SO_2) Emissions from Discoverer Emission Units.** The permittee shall not combust any liquid fuel with sulfur content greater than 0.0015 percent by weight, as determined by Condition B.5.1, in any emission unit on the Discoverer (except for Unit FD-7).

5.1. Representative fuel samples shall be obtained using one of the methods in 40 CFR § 80.330(b). The sulfur content of the fuel shall be determined using ASTM D 5453-08b.

5.2. Monitoring, Recordkeeping and Reporting. The permittee shall:

5.2.1. Prior to mobilizing the Discoverer for the first time at the beginning of a drilling season, determine the sulfur content in each fuel oil storage tank on the Discoverer. The permittee shall obtain a representative sample of the fuel and analyze the sample for sulfur content using the procedures in Condition B.5.1.

5.2.2. Thereafter, determine and record the sulfur content upon receiving each fuel shipment, as follows:

5.2.2.1. Obtain a representative sample of the fuel delivered and analyze the sample for sulfur content using the procedures in Condition B.5.1; or

5.2.2.2. Obtain a single certification of sulfur content for each shipment of fuel from the fuel supplier based on an analysis of the fuel, providing that the certification indicates that the sulfur content has been determined by the ASTM method listed in Condition B.5.1.

5.3. Within 3 business days of identification, report to the EPA any instance of a liquid fuel with sulfur content greater than 0.0015 percent by weight being combusted in any emission unit on the Discoverer (except Unit FD-7).

6. **Greenhouse Gas Potential to Emit Owner Requested Limit for Discoverer and Associated Fleet**

6.1. At all times while the Discoverer is an OCS Source, greenhouse gas (GHG) emissions as defined in 40 CFR § 52.21(b)(49) from the Discoverer and Associated Fleet, when within 25 miles of the Discoverer, shall not exceed 70,000 tons carbon dioxide equivalent (CO_2e) as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months.

6.1.1. For emission units that combust fuel, monthly carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions (tons) shall be determined by multiplying the appropriate emission factors for distillate oil in 40 CFR Part 98, Subpart C, Tables C-1 and C-2, by the recorded monthly fuel usage (gallons/month) and dividing by 2000 lb/ton.

6.1.2. For emission units that incinerate waste, monthly CO_2 emissions (tons) shall be determined by multiplying the CO_2 emission factor for incinerators in AP42 Table 2.1-7 (10/96) by the recorded monthly quantities of waste incinerated (tons/month) and dividing by 2000 lb/ton.

6.1.3. To account for mud off-gassing, monthly CH_4 emissions from the drilling mud shall be assumed to be 0.798 tons/month.

6.1.4. Monthly CO_2e emissions (tons) shall be determined by multiplying the calculated monthly emissions for CO_2, CH_4, and N_2O from all emission

units and activities by the applicable global warming potential factors from 40 CFR Part 98, Subpart A, Table A-1, and summing the products.

6.2. At all times while the Discoverer is an OCS Source, the total amount of fuel combusted in engines and boilers on the Discoverer and Associated Fleet, when within 25 miles of the Discoverer, shall not exceed 6,346,493 gallons during any rolling 12-month period.

6.3. At all times while the Discoverer is an OCS Source, the total amount of waste combusted in incinerators on the Discoverer and Associated Fleet, when within 25 miles of the Discoverer, shall not exceed 1,657,440 pounds during any rolling 12-month period.

6.4. Monitoring, Recordkeeping and Reporting. The permittee shall monitor and record monthly fuel consumption and waste incineration as follows:

6.4.1. Equip each fuel combustion source on the Discoverer and Associated Fleet, except for seldom used sources, with a diesel fuel flow meter to continuously measure and record the fuel flow rate:

6.4.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) being served by the meter.

6.4.1.2. Each fuel flow meter shall be totalizing and nonresettable.

6.4.1.3. 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.

6.4.1.4. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

6.4.1.5. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

6.4.2. Measure the fuel combusted in each seldom used fuel combustion source on the Discoverer and Associated Fleet by recording the quantity of fuel in each engine's fuel tank before and after periodic operation of each seldom used source:

6.4.2.1. Fuel tank content measurement may take the form of sight glass, use of a graduated dip stick, or tank instrumentation.

6.4.3. Calculate and record monthly fuel consumption for each fuel combustion source on the Discoverer and Associated Fleet in gallons. Determine the 12-month rolling fuel consumption by adding the gallons for each month to the gallons recorded for the previous 11 months.

6.4.4. For each batch of waste charged to an incinerator:

6.4.4.1. Record the date and time that each batch of waste was charged to the incinerator;

6.4.4.2. Weigh the batch of waste by using a weigh scale used that shall be accurate to within 0.5 lbs; and

6.4.4.3. Record the weight of each batch of waste charged to the incinerator.

6.4.5. 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 the weigh scale to determine its accuracy. Submit this information to the EPA no less than 30 days prior to operation within the Beaufort Sea.

6.4.6. Maintain the accuracy of the weigh scale in accordance with manufacturer's recommendations.

6.4.7. Calculate and record monthly waste combusted in each incinerator on the Discoverer and Associated Fleet in pounds. Determine the 12-month rolling waste combusted by adding the waste combusted for each month to the waste combusted for the previous 11 months.

7. **Sulfuric Acid Mist Potential to Emit Owner Requested Limit for Associated Fleet.** The permittee shall not combust any liquid fuel with sulfur content greater than 0.0015 percent by weight, as determined by Condition B.7.1, in any emission unit on any vessel in the Associated Fleet.

7.1. Representative fuel samples shall be obtained using one of the methods in 40 CFR § 80.330(b). The sulfur content of the fuel shall be determined using ASTM D 5453-08b.

7.2. Monitoring, Recordkeeping and Reporting. The permittee shall:

7.2.1. Prior to mobilizing the Discoverer for the first time at the beginning of a drilling season, determine the sulfur content in each fuel oil storage tank on the vessels comprising the Associated Fleet. The permittee shall obtain a representative sample of the fuel and analyze the sample for sulfur content using the procedures in Condition B.7.1.

7.2.2. Thereafter, determine and record the sulfur content upon receiving each fuel shipment, as follows:

7.2.2.1. Obtain a representative sample of the fuel delivered and analyze the sample for sulfur content using the procedures in Condition B.7.1; or

7.2.2.2. Obtain a single certification of sulfur content for each shipment of fuel from the fuel supplier based on an analysis of the fuel, providing that the certification indicates that the sulfur content

has been determined by the ASTM method listed in Condition B.7.1.

7.3. Within 3 business days of identification, report to the EPA any instance of a liquid fuel with sulfur content greater than 0.0015 percent by weight being combusted in any emission unit on any vessel in the Associated Fleet.

8. **BACT for Particulate Matter Emissions (PM, PM_{10}, and $PM_{2.5}$) from Discoverer Diesel IC Engine Crankcase Ventilation.** Except for the MLC Diesel Compressor Engines (FD-9 –11) and the Caterpillar C7 Logging Winch Engine (FD-19), each diesel IC engine on the Discoverer shall be equipped with a closed crankcase ventilation system.

9. **COA Regulations: Industrial Process and Fuel-Burning Equipment Visible Emissions Standard.** The permittee shall comply with the following.

9.1. Do not cause or allow visible emissions, excluding condensed water vapor, emitted from Units FD-1 through 22, and FD-31 listed in Table 1 to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.

9.2. For Units FD-1 through 22, and FD-31, monitor, record, and report in accordance with Condition B.10.1 – B.12.

9.3. For Units FD-1 through 22, and FD-31, as long as they do not exceed the limits in Condition B.9, monitoring shall consist of an annual compliance certification (as provided in Condition A.22.1) with the opacity standard.

10. **COA Regulations: Visible Emissions Monitoring, Recordkeeping, and Reporting.**

10.1. **Visible Emissions Monitoring.** When required by any of the requirements for Units FD-1 through 31 specified in Sections C through R below, or in the event of replacement during the permit term, the permittee shall observe the exhaust of emission Units FD-1 through 22, and FD-31 listed in Table 1 for visible emissions using either the Method 9 Plan under Condition B.10.2 or the Smoke/No-Smoke Plan under Condition B.10.3. The permittee may change visible-emissions plans for an emission unit at any time unless prohibited from doing so by Condition B.10.4. The permittee may, for each unit, elect to continue the visible emission monitoring schedule in effect from the previous permit at the time a renewal permit is issued, if applicable.

10.2. **Method 9 Plan.** For all 18-minute observations in this plan, observe exhaust, following 40 CFR 60, Appendix A-4, Method 9, adopted by reference in 18 AAC 50.040(a), for 18 minutes to obtain 72 consecutive 15-second opacity observations.

10.2.1. **First Method 9 Observation.** Observe exhaust for 18 minutes within six months after the issue date of this permit. For any emission unit, observe exhaust for 18 minutes within 14 calendar days after changing from the Smoke/No-Smoke Plan of Condition B.10.3. For any emission units replaced during the term of this permit, observe exhaust for 18 minutes within 30 days of startup.

10.2.2. **Monthly Method 9 Observations.** After the first Method 9 observation, perform 18-minute observations at least once in each calendar month that an emission unit operates.

10.2.3. **Annual Method 9 Observations.** After observing emissions for three consecutive operating months under Condition B.10.2.1, unless a six-minute average is greater than 15 percent and one or more observations are greater than 20 percent, perform 18-minute observations at least annually.

10.2.4. **Increased Method 9 Frequency.** If a six-minute average opacity is observed during the most recent set of observations to be greater than 15 percent and one or more observations are greater than 20 percent, then increase or maintain the 18-minute observation frequency for that emission unit to at least monthly intervals, until the criteria in Condition B.10.2.3 for annual monitoring are met.

10.3. **Smoke/No Smoke Plan.** Observe the exhaust for the presence or absence of visible emissions, excluding condensed water vapor.

10.3.1. **Initial Monitoring Frequency.** Observe the exhaust during each calendar day that an emission unit operates.

10.3.2. **Reduced Monitoring Frequency.** After the emission unit has been observed on 30 consecutive operating days, if the emission unit operated without visible smoke in the exhaust for those 30 days, then observe emissions at least once in every calendar month that an emission unit operates.

10.3.3. **Smoke Observed.** If smoke is observed, either begin the Method 9 Plan of Condition B.10.2 or perform the corrective action required under Condition B.10.4.

10.4. **Corrective Actions Based on Smoke/No Smoke Observations.** If visible emissions are present in the exhaust during an observation performed under the Smoke/No Smoke Plan of Condition B.10.3, then the permittee shall either follow the Method 9 plan of Condition B.10.2 or:

10.4.1. Initiate actions to eliminate smoke from the emission unit within 24 hours of the observation;

10.4.2. Keep a written record of the starting date, the completion date, and a description of the actions taken to reduce smoke; and

10.4.3. After completing the actions required under Condition B.10.4.1,

10.4.3.1. Take Smoke/No Smoke observations in accordance with Condition B.10.3.

10.4.3.1.1. At least once per day for the next seven operating days and until the initial 30 day observation period is completed; and

10.4.3.1.2. Continue as described in Condition B.10.3.2; or

10.4.3.2. If the actions taken under Condition B.10.4.1 do not eliminate the smoke, or if subsequent smoke is observed under the schedule of Condition B.10.4.3.1.1, then observe the exhaust using the Method 9 Plan unless the EPA gives written approval to resume observations under the Smoke/No Smoke Plan; after observing smoke and making observations under the Method 9 Plan, the permittee may at any time take corrective action that eliminates smoke and restart the Smoke/No Smoke Plan under Condition B.10.3.1.

11. **COA Regulations: Visible Emissions Recordkeeping.** The permittee shall keep records as follows.

11.1. If using the Method 9 Plan of Condition B.10.2,

11.1.1. The observer shall record:

11.1.1.1. The name of the OCS Source, emission unit and location, emission unit type, observer's name and affiliation, and the date on the Visible Emissions Field Data Sheet in Appendix B;

11.1.1.2. The time, estimated distance to the emissions location, sun location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), plume background, and operating rate (load or fuel consumption rate) on the sheet at the time opacity observations are initiated and completed;

11.1.1.3. The presence or absence of an attached or detached plume and the approximate distance from the emissions outlet to the point in the plume at which the observations are made;

11.1.1.4. Opacity observations to the nearest five percent at 15-second intervals on the Visible Emissions Field Data Sheet in Appendix B; and

11.1.1.5. The minimum number of observations required by the permit; each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period.

11.1.2. To determine the six-minute average opacity, divide the observations recorded on the record sheet into sets of 24 consecutive observations; sets need not be consecutive in time and in no case shall two sets overlap; for each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24; record the average opacity on the sheet; and

11.1.3. Calculate and record the highest 6-minuite and 18-consecutive-minute averages observed.

11.2. If using the Smoke/No Smoke Plan of Condition 10.3, record the following information in a written log for each observation and submit copies of the recorded information upon request of the EPA:

11.2.1. The date and time of the observation;

11.2.2. From Table 1, the emission unit identification number of the emission unit observed;

11.2.3. Whether visible emissions are present or absent in the exhaust;

11.2.4. A description of the background to the exhaust during the observation;

11.2.5. If the emission unit starts operation on the day of the observation, the startup time of the emission unit;

11.2.6. Name and title of the person making the observation; and

11.2.7. Operating rate (load or fuel consumption rate).

12. **COA Regulations: Visible Emissions Reporting.** The permittee shall report visible emissions as follows.

12.1. Include in each Operating Report under Condition A.18:

12.1.1. Which visible-emissions plan of Condition B.10.1 was used for each emission unit; if more than one plan was used, give the time periods covered by each plan;

12.1.2. For each emission unit under the Method 9 Plan,

12.1.2.1. Copies of the observation results (i.e. opacity observations) for each emission unit that used the Method 9 Plan, except for the observations the permittee has already supplied to the EPA; and

12.1.2.2. A summary to include:

12.1.2.2.1. Number of days observations were made;

12.1.2.2.2. Highest six-minute average observed; and

12.1.2.2.3. Dates when one or more observed six-minute averages were greater than 20 percent.

12.1.3. For each emission unit under the Smoke/No Smoke Plan, the number of days that Smoke/No Smoke observations were made and which days, if any, that smoke was observed; and

12.1.4. A summary of any monitoring or record keeping required under Conditions B.10.1 and B.10.4.3.2 that was not done.

12.2. Report under Condition A.17:

12.2.1. The results of Method 9 observations that exceed an average 20 percent for any six-minute period; and

12.2.2. If any monitoring under Condition B.10.1 was not performed when required, report within three days of the date the monitoring was required.

13. **COA Regulations: Industrial Process and Fuel-Burning Equipment Particulate Matter Standard.** The permittee shall not cause or allow PM emitted from Units FD-1 through 22, and FD-31 listed in Table 1 to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

13.1. For Units FD-1 through 22, and FD-31 listed in Table 1, monitor, record and report in accordance with Conditions B.14 – B.15.

13.2. For Units FD-1 through 22, and FD-31, as long as they do not exceed the limits in Condition B.13, monitoring shall consist of an annual compliance certification (as provided in Condition A.22.1) with the PM standard.

13.3. In source testing for compliance with the PM standards in 18 AAC 50.050 or 18 AAC 50.055, the three-hour average is determined using the average of three one-hour test runs. The source test must account for those emissions caused by soot blowing, grate cleaning, or other routine maintenance activities by ensuring that at least one test run includes the emissions caused by the routine maintenance activity and is conducted under conditions that lead to representative emissions

$$E = E_M \left[(A + B)\, x\, \frac{S}{R\, x\, A} \right] + E_{NM} \left[\frac{(R - S)}{R} - \frac{BS}{R\, x\, A} \right]$$

from that activity. The emissions must be quantified using the following equation:

Where:

E = the total particulate emissions of the source in grains per dry standard cubic foot (gr/dscf).

E_M = the particulate emissions in gr/dscf measured during the test that included the routine maintenance activity.

E_{NM} = the arithmetic average of particulate emissions in gr/dscf measured by the test runs that did not include routine maintenance activity.

A = the period of routine maintenance activity occurring during the test run that included routine maintenance activity, expressed to the nearest hundredth of an hour.

B = the total period of the test run, less A.

R = the maximum period of source operation per 24 hours, expressed to the nearest hundredth of an hour.

S = the maximum period of routine maintenance activity per 24 hours, expressed to the nearest hundredth of an hour.

14. **COA Regulations: Particulate Matter Monitoring, Recordkeeping, and Reporting.** PM Monitoring for Diesel Engines. The permittee shall conduct source tests on diesel engines Units FD-1 through 20, and FD-31 to determine the concentration of (PM) in the exhaust of a source in accordance with Condition B.14.

14.1. Within six months of exceeding the criteria of Conditions B.14.2.1 or B.14.2.2, either:

14.1.1. Conduct a PM source test according to requirements set out in Condition B.21, or

14.1.2. Make repairs so that emissions no longer exceed the criteria of Condition B.14.2; to show that emissions are below those criteria, observe emissions as described in Condition B.10.2 under load conditions comparable to those when the criteria were exceeded.

14.2. Conduct the test according to Condition B.14.1 if:

14.2.1. 18 consecutive minutes of Method 9 observations result in an 18-minute average opacity greater than 20 percent; or

14.2.2. For a source with an exhaust stack diameter that is less than 18 inches, 18 consecutive minutes of Method 9 observations result in an 18-minute average opacity that is greater than 15 percent and not more than 20 percent, unless the EPA has waived this requirement in writing.

14.3. During each one-hour PM source test run, observe the exhaust for 60 minutes in accordance with Method 9 and calculate the average opacity measured during each one-hour test run. Submit a copy of these observations with the source test report.

14.4. The automatic PM source test requirements in Conditions B.14.1 and B.14.2 is waived for an emissions unit if a PM source test on that emission unit has shown compliance with the PM standard during this permit term.

15. **COA Regulations: Particulate Matter Record Keeping for Diesel Engines.** Within 180 calendar days after the effective date of this permit, the permittee shall record the exhaust stack diameter(s) of Units FD-1 through 20 and FD-31 from Table 1 in the permit. Report the stack diameter(s) in the next Operating Report under Condition A.18.

15.1. PM Reporting for Diesel Engines. The permittee shall report as follows:

15.1.1. Report under Condition A.17:

15.1.1.1. The results of any PM source test that exceeds the PM emissions limit; or

15.1.1.2. If one of the criteria of Condition B.14.2 was exceeded and the permittee did not comply with either Condition B.14.1.1 or B.14.1.2, this must be reported by the day following the day compliance with Condition B.14.1 was required;

15.2. Report observations in excess of the threshold of Condition B.14.2.2 within 30 days of the end of the month in which the observations occur.

15.3. In each OCS source Operating Report under Condition A.18, include:

15.3.1. The dates, EU ID(s), and results when an observed 18-minute average was greater than an applicable threshold in Condition B.14.2;

15.3.2. A summary of the results of any PM testing under Condition B.14; and

15.3.3. Copies of any visible emissions observation results (opacity observations) greater than the thresholds of Condition B.14.2, if they were not already submitted.

16. **COA Regulations: Particulate Matter Monitoring for Liquid-Fired Boilers and Heaters.** The permittee shall conduct source tests on Units FD-21 through 22 to determine the concentration of PM in the exhaust of Units FD-21 through 22 as follows.

16.1. Conduct a PM source test according to the requirements set out in Condition B.21 no later than 90 calendar days after any time corrective maintenance fails to eliminate visible emissions greater than the 20 percent opacity threshold for two or more 18-minute observations in a consecutive six-month period.

16.2. During each one-hour PM source test run, observe the exhaust for 60 minutes in accordance with Method 9 and calculate the average opacity measured during each one-hour test run.

16.3. The PM source test requirement in Condition B.16 is waived for an emission unit if:

16.3.1. A PM source test during the most recent annual reporting period on that emission unit shows compliance with the PM standard since permit issuance, or

16.3.2. If a follow-up visible emission observation conducted using Method-9 during the 90 days shows that the excess visible emissions described in Condition B.10.2.4 no longer occur.

17. **COA Regulations: Particulate Matter Recordkeeping for Liquid Fired Boilers and Heaters.** The permittee shall keep records of the results of any PM testing and visible emissions observations conducted under Condition B.16. The permittee shall report as follows:

17.1. In each OCS source Operating Report required by Condition A.18, include:

17.1.1. The dates, emission units, and results when an 18-minute opacity observation was greater than the applicable threshold criterion in Condition B.10.2.4; and

17.1.2. A summary of the results of any PM testing and visible emissions observations conducted under Condition B.16.

17.2. Report as excess emissions, in accordance with Condition A.17, any time the results of a source test for PM exceeds the PM emission limit stated in Condition B.13.

18. **COA Regulations: Sulfur Compound Emissions Standard.** Sulfur Compound Emissions. In accordance with 18 AAC 50.055(c), the permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, from Units FD-1 through 22, and FD-31 listed in Table 1 to exceed 500 parts per million (ppm) averaged over three hours.

18.1. For Units FD-1 through 22, and FD-31, monitor, record and report in accordance with Conditions B.19 through B.20.

19. **COA Regulations: Sulfur Compound Monitoring, Recordkeeping, and Reporting Liquid Fuel-fired Sources.** Sulfur Compound Emissions – Monitoring and Recordkeeping.

19.1. If a load of fuel contains greater than 0.0015 percent sulfur by weight, the permittee shall calculate SO_2, emissions in ppm using the SO_2, Material Balance Calculation as described below or Method 19 of 40 CFR 60, Appendix A-7, adopted by reference in 18 AAC 50.040(a).

SO_2 Material Balance Calculation

If a fuel shipment contains more than 0.0015 percent sulfur by weight, calculate the three-hour exhaust concentration of SO_2 using the following equations:

A = 31,200 x [**wt%S_{fuel}**] = 31,200 x _____ = _____

B = 0.148 x [**wt%S_{fuel}**] = 0.148 x _____ = _____

C = 0.396 x [**wt%C_{fuel}**] = 0.396 x _____ = _____

D = 0.933 x [**wt%H_{fuel}**] = 0.933 x _____ = _____

E = B + C + D = _____ + _____ + _____ = _____

F = 21 – [**vol%dry$O_{2,\ exhaust}$**] = 21 - _____ = _____

G = [**vol%dry$O_{2,\ exhaust}$**] ÷ F = _____ ÷ _____ = _____

H = 1 + G = 1 + _____ = _____

I = E x H = _____ x _____ = _____

SO_2 concentration = A ÷ I = _____ ÷ _____ = _____ PPM

The **wt%S_{fuel}**, **wt%C_{fuel}**, and **wt%H_{fuel}** are equal to the weight percents of sulfur, carbon, and hydrogen in the fuel. These percentages should total 100%.

The fuel weight percent (wt%) of sulfur is obtained pursuant to Condition B.5.2.2. The fuel weight percents of carbon and hydrogen are obtained from the fuel refiner.

The volume percent of oxygen in the exhaust (**vol%dry$O_{2,\ exhaust}$**) is obtained from oxygen meters, manufacturer's data, or from the most recent analysis under 40 CFR 60, Appendix A-2, Method 3, adopted by reference in 18 AAC 50.040(a), at the same engine load used in the calculation.

Enter all of the data in percentages without dividing the percentages by 100. For example, if wt% S_{fuel} = 1.0%, then enter 1.0 into the equation not 0.01 and if the vol%dry$O_{2,}$ exhaust = 3.00% then enter 3.00, not 0.03.

20. **COA Regulations: Sulfur Compound Emissions – Reporting.** The permittee shall report as follows.

20.1. If SO_2, emissions are calculated under Condition B.19.1 to exceed 500 ppm, the permittee shall report under Condition A.17. When reporting under this Condition B.20.1 include the calculation under Condition B.19.1.

20.2. The permittee shall include in the report required by Condition A.18 a list of the fuel grades received at the OCS Source during the reporting period:

20.2.1. For any grade with a maximum fuel sulfur greater than 0.0015 percent sulfur, the fuel sulfur of each shipment; and

20.2.2. For fuel with a sulfur content greater than 0.0015 percent, the calculated SO_2 emissions in ppm.

21. **General Testing Requirements.** Whenever conducting a stack test required by this permit, and unless specifically stated otherwise in this permit, the permittee shall comply with the following testing requirements in addition to the specific testing requirements contained in the emission unit sections of this permit.

21.1. The permittee shall provide the EPA at least 30 days prior notice of any stack test. If after 30 days notice for an initially scheduled stack test, there is a delay in conducting the scheduled stack test, the permittee shall notify the EPA as soon as possible of any delay in the original test date, either by providing at least 7 days prior notice of the rescheduled date of the stack test, or by arranging a rescheduled date with the EPA by mutual agreement.

21.2. The permittee shall submit to the EPA a complete stack test plan within 60 days after receiving a request by the EPA and at least 30 days prior to any required testing unless the EPA agrees in writing to some other time period. Retesting may be done without resubmitting the plan provided it is conducted in accordance with the previously submitted plan. The permittee shall follow the submitted test plan except as otherwise agreed to in writing by EPA prior to the testing. The source test plan shall include and address the following elements:

21.2.1. Purpose and scope of testing;

21.2.2. Source description, including a description of the operating scenarios and mode of operation during testing and including fuel sampling and analysis procedures;

21.2.3. Schedule/dates of testing;

21.2.4. Process data to be collected during the test and reported with the results, including source-specific data identified in the emission unit sections of this permit;

21.2.5. Sampling and analysis procedures, specifically requesting approval for any proposed alternatives to the reference test methods, and addressing minimum test length (e.g., one hour, 8 hours, 24 hours, etc.) and minimum sample volume;

21.2.6. Sampling location description and compliance with the reference test methods;

21.2.7. Analysis procedures and laboratory identification;

21.2.8. Quality assurance plan;

21.2.9. Calibration procedures and frequency;

21.2.10. Sample recovery and field documentation;

21.2.11. Chain of custody procedures;

21.2.12. Quality Assurance (QA)/Quality Control (QC) project flow chart;

21.2.13. Data processing and reporting;

21.2.14. Description of data handling and QC procedures; and

21.2.15. Report content and timing.

21.3. Unless otherwise specified in this permit, or the EPA determines in writing that other operating conditions are representative of normal operations or unless specified in the emission unit sections of this permit, the source shall be operated at a capacity of at least 90 percent but no more than 100 percent of maximum during all tests.

21.4. Unless otherwise specified by an applicable requirement or test method, the permittee shall conduct source testing at a point or points that characterize the actual discharge into the ambient air.

21.5. Only regular operating staff may adjust the processes or emission control devices during or within 2 hours prior to the start of a source test. Any operating adjustments made during a source test, that are a result of consultation during the tests with source testing personnel, equipment vendors, or consultants, may render the source test invalid.

21.6. For the duration of each test run (unless otherwise specified), the permittee shall record the following information:

21.6.1. All data which is required to be monitored during the test in the emission unit sections of this permit; and

21.6.2. All continuous monitoring system data which is required to be routinely monitored in the emission unit sections of this permit for the emission unit being tested.

21.7. Each source test shall follow the reference test methods specified by this permit and consist of at least three (3) valid test runs. For purposes of this permit:

21.7.1. EPA Test Methods 1, 2, 3A, 4, 5, 6C, 7E, 9, 10, 19, and 25A are set forth in 40 CFR Part 60, Appendix A;

21.7.2. EPA Test Methods 201A and 202 are set forth in 40 CFR Part 51, Subpart M;

21.7.3. Conditional Test Method 027 (CTM-027), "Procedure for Collection and Analysis of Ammonia in Stationary Sources," is set forth at http://www.epa.gov/ttn/emc/ctm.html;

21.7.4. Conditional Test Method 038 (CTM-038), "Measurement of Ammonia Emissions from Highway, Nonroad, and Stationary Use Diesel Engines by Extractive Fourier Transform Infrared (FTIR) Spectroscopy," is set forth at http://www.epa.gov/ttn/emc/ctm.html;

21.7.5. Other Test Method 27 (OTM 27), "Determination of PM_{10} and $PM_{2.5}$ Emissions from Stationary Sources (Constant Sampling Rate Procedure)," is set forth at http://www.epa.gov/ttn/emc/prelim.html; and

21.7.6. ASTM D 5453-09 is set forth at http://www.astm.org/Standards/D5453.htm.

21.8. Facilities for performing and observing the emission testing shall be provided that meet the requirements of 40 CFR § 60.8(e) and EPA Method 1.

21.9. Emission test reports shall be submitted to the EPA within 45 days of completing any emission test required by this permit along with items required to be recorded in Condition B.21.6 above.

21.10. EPA Methods 1, 2, 3A, 3B, 4 and 19 shall be used as necessary to convert the measured NO_X, PM, PM_{10}, $PM_{2.5}$, and CO emissions into units of the emission limits in the permit.

21.11. Source test emission data shall be reported as the arithmetic average of all valid test runs and in the terms of any applicable emission limit, unless otherwise specified in the emission unit sections of this permit.

21.12. An alternative test method or a deviation from a test method identified in this permit may be approved as follows.

21.12.1. The permittee must submit a written request to the EPA at least 60 days before the stack test is scheduled to begin which includes the reasons why the alternative or deviation is needed and the rationale and data to demonstrate that the alternative test method or deviation from the reference test method:

21.12.1.1. Provides equal or improved accuracy and precision as compared to the specified reference test method; and

21.12.1.2. Does not decrease the stringency of the standard as compared to the specified reference test method.

21.12.2. If requested by the EPA, the demonstration referred to in Condition B.21.12.1 must use Method 301 in 40 CFR Part 63, Appendix A, to validate the alternative test method or deviation.

21.12.3. The EPA must approve the request in writing.

21.12.4. Until the EPA has given written approval to use an alternative test method or to deviate from the test method specified in this permit, the permittee is

required to use the test method specified in this permit when conducting a source test under this permit.

21.13. The permittee may request an extension to a source test deadline established by the EPA. The permittee may delay a source test beyond the original deadline only if the extension is approved in writing by the EPA.

21.14. In addition to any source testing explicitly required by this permit, the permittee shall conduct source testing as requested by the EPA to determine compliance with applicable permit requirements.

21.15. For any source test requiring the use of Method 201A, the permittee may substitute the use of Method 5. In either case, Method 202 shall also be employed for condensable PM, and the test results shall consider all PM to be $PM_{2.5}$.

22. **Prohibited Activities.** The permittee shall not:

22.1. Flow test wells;

22.2. Flare gas;

22.3. Store liquid hydrocarbons recovered during well testing;

22.4. Refuel any vessel (excluding the Discoverer, the Kvichak workboats, and Rozema Skimmer) within 25 miles of the Discoverer while the Discoverer is an OCS Source, or

22.5. Allow any vessel associated with this project, and that is not authorized by Tables 1 through 5 of this permit, to approach within 25 miles of the Discoverer, while the Discoverer is an OCS Source.

23. **Monthly Emissions Calculations.** By the tenth of each month, the permittee shall, using monitoring data collected pursuant to the requirements of this permit, calculate and record the monthly emissions of CO, NO_X, $PM_{2.5}$, PM_{10}, SO_2, VOC, and GHG emissions for the preceding month. For NO_X, the permittee shall also calculate and record the monthly emissions for the preceding month for each engine, boiler, or incinerator (or groups of engines or boilers) that are subject to an annual NO_X emission limit in this permit.

24. **Rolling 12-Month Emissions Calculations.** By the tenth of each month, the permittee shall calculate and record the rolling 12-month emissions of CO, NO_X, $PM_{2.5}$, PM_{10}, SO_2, VOC, and GHG emissions by using the monthly emissions calculated for the previous 12 months pursuant to Condition B.22.5. For NO_X, the permittee shall also calculate and record the rolling 12-month emissions for each engine, boiler, or incinerator (or groups of engines or boilers) that are subject to an annual NO_X emission limit in this permit.

25. **Good Operating and Maintenance Requirements.** At all times, including periods of startup, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate each emission unit, including any associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the EPA which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures,

and inspection of the source. The permittee shall keep records of any maintenance that would have a significant effect on emissions (the records may be kept in electronic format) and keep a copy of either the manufacturer's or the operator's maintenance procedures.

26. **COA Regulations: Good Air Pollution Control Practice.** The permittee shall do the following for Units FD-1 through 23 and FD-31:

26.1. Perform regular maintenance considering the manufacturer's or the operator's maintenance procedures;

26.2. Keep records of any maintenance that would have a significant effect on emissions; the records may be kept in electronic format; and

26.3. Keep a copy of either the manufacturer's or the operator's maintenance procedures.

27. **COA Regulations: Air Pollution Prohibited.** No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

27.1. If emissions present a potential threat to human health or safety, the permittee shall report any such emissions according to Condition A.17.

27.2. As soon as practicable after becoming aware of a complaint that is attributable to emissions from the emission units regulated under this permit, the permittee shall investigate the complaint to identify emissions that the permittee believes have caused or are causing a violation of Condition B.27.

27.3. The permittee shall initiate and complete corrective action necessary to eliminate any violation identified by a complaint or investigation as soon as practicable if:

27.3.1. After an investigation because of a complaint or other reason, the permittee believes that emissions from the OCS source have caused or are causing a violation of Condition B.27; or

27.3.2. The EPA notifies the permittee that it has found a violation of Condition B.27.

27.4. The permittee shall keep records of:

27.4.1. The date, time, and nature of all emissions complaints received;

27.4.2. The name of the person or persons that complained, if known;

27.4.3. A summary of any investigation, including reasons the permittee does or does not believe the emissions have caused a violation of Condition B.27; and

27.4.4. Any corrective actions taken or planned for complaints attributable to emissions from the OCS source.

27.5. With each OCS Operating Report under Condition A.18, the permittee shall include a brief summary report which must include:

27.5.1. The number of complaints received;

27.5.2. The number of times the permittee or the EPA found corrective action necessary;

27.5.3. The number of times action was taken on a complaint within 24 hours; and

27.5.4. The status of corrective actions the permittee or the EPA found necessary that were not taken within 24 hours.

27.6. The permittee shall notify the EPA of a complaint that is attributable to emissions from the emission units regulated under this permit within 24 hours after receiving the complaint, unless the permittee has initiated corrective action within 24 hours of receiving the complaint.

28. **Selective Catalytic Reduction (SCR) Control Device Monitoring.** For any emission unit that is required by this permit to be controlled by an SCR control device, the permittee shall install, calibrate, operate, and maintain (in accordance with manufacturer specifications) continuous monitoring systems (CMS) to measure and record inlet temperature in degrees Fahrenheit (ºF), urea feed rate (gallons/min), and catalyst activity (NO_X ppm concentration) as follows:

28.1. Prepare and submit 60 days before the first drilling season a site-specific monitoring plan that addresses the monitoring system design, data collection, quality assurance, and quality control elements outlined in this condition. Install, calibrate, operate, and maintain each CMS according to the procedures in the approved site-specific monitoring plan. The plan shall address the performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, sensor tolerance and sensitivity, and data acquisition and calculations; sampling interface (e.g., thermocouple, flow meter) location such that the monitoring system will provide representative measurements; equipment performance checks, system accuracy audits, or other audit procedures; ongoing operation and maintenance procedures; and ongoing reporting and recordkeeping procedures.

28.2. The temperature and urea CMS shall collect data at least once every 15 minutes.

28.3. Conduct the CMS equipment performance checks, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan within 60 days prior to each drilling season and at least once every 3 months for the duration of the drilling season.

28.4. Conduct a performance evaluation of each CMS in accordance with the site-specific monitoring plan.

28.5. Except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities (including, as applicable, system accuracy audits and required zero and span adjustments), operate the CMS at all times the affected source is operating. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. Complete monitoring system repairs in response to

monitoring system malfunctions and return the monitoring system to operation as expeditiously as practicable.

28.6. Monitor and record NO_X emissions (ppm) from the exhaust of each SCR unit once per week using a portable NO_X monitor that meets the requirements of EPA OTM 13 found at http://www.epa.gov/ttn/emc/prelim/otm13.pdf.

28.7. Report as a deviation under Condition A.17.3 any periods during which the urea pump is not operating, the inlet temperature is less than 250°C, or the NO_X concentration is 150% or more than the NO_X concentration measured during the most recent previous source test that produced compliance data or emission factors for this permit.

29. **Oxidation Catalyst Control Device Monitoring.** For any emission unit that is required by this permit to be controlled by an oxidation catalyst control device, the permittee shall install, calibrate, operate, and maintain (in accordance with manufacturer specifications) CMS to measure and record inlet temperature (ºF), and catalyst activity (CO ppm concentration) as follows:

29.1. Prepare and submit 60 days before the first drilling season a site-specific monitoring plan that addresses the monitoring system design, data collection, quality assurance, and quality control elements outlined in this condition. Install, calibrate, operate, and maintain each CMS according to the procedures in the approved site-specific monitoring plan. The plan shall address the performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, sensor tolerance and sensitivity, and data acquisition and calculations; sampling interface (e.g., thermocouple) location such that the monitoring system will provide representative measurements; equipment performance checks, system accuracy audits, or other audit procedures; ongoing operation and maintenance procedures; and ongoing reporting and recordkeeping procedures.

29.2. The temperature CMS shall collect data at least once every 15 minutes.

29.3. Conduct the CMS equipment performance checks, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan within 60 days prior to each drilling season and at least once every 3 months for the duration of the drilling season.

29.4. Conduct a performance evaluation of each CMS in accordance with the site-specific monitoring plan.

29.5. Except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities (including, as applicable, system accuracy audits and required zero and span adjustments), operate the CMS at all times the affected source is operating. A monitoring system malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions. Complete monitoring system repairs in response to

monitoring system malfunctions and return the monitoring system to operation as expeditiously as practicable.

29.6. Monitor and record CO emissions (ppm) from the exhaust of each oxidation catalyst unit once per week using a portable CO monitor that meets the requirements of EPA OTM 13 found at http://www.epa.gov/ttn/emc/prelim/otm13.pdf.

29.7. Report as a permit deviation under Condition A.17.3 any periods during which the inlet temperature is less than 300°C, or the CO concentration is 120% or more than the CO concentration measured during the most recent previous source test that produced compliance data or emission factors for this permit.

C. DISCOVERER GENERATOR ENGINES (FD-1 – 6)

1. **Operation of Selective Catalytic Reduction (SCR) Unit.** At all times that any of Units FD-1 – 6 are in operation, the exhaust from each emission unit shall be directed to an operating SCR emission unit.

2. **Operation of Oxidation Catalyst.** At all times that any of Units FD-1 – 6 are in operation, the exhaust from each emission unit shall be directed to an operating oxidation catalyst.

3. **BACT Limits.** Emissions from each generator engine (Units FD-1 – 6) shall not exceed the emission limits specified for each of the pollutants below:

3.1. **Nitrogen oxides (NO_X):** 0.50 grams (g) per kilowatt-hour (kW-hr)

3.1.1. For compliance with Condition C.3.1, measurement of NO_X shall be determined using EPA Method 7E.

3.2. **Ammonia (NH_3):** 5 parts per million by volume (ppmv) at actual stack gas conditions

3.2.1. For compliance with Condition C.3.2, measurement of NH_3 shall be determined using EPA Conditional Test Method 027 or 038.

3.3. **Particulate Matter:** 0.127 g/kW-hr

3.3.1. For compliance with Condition C.3.3, measurement of PM shall be determined using EPA Method 5.

3.4. **Particulate Matter with an aerodynamic diameter less than 10 microns (PM_{10}):** 0.127 g/kW-hr

3.4.1. For compliance with Condition C.3.4, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

3.5. **Particulate Matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$):** 0.127 g/kW-hr.

3.5.1. For compliance with Condition C.3.5, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

3.6. **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

3.6.1. For compliance with Condition C.3.6, measurement of visible emissions shall be determined using EPA Method 9.

3.7. **Carbon Monoxide (CO):** 0.1790 g/kW-hr

3.7.1. For compliance with Condition C.3.7, measurement of CO shall be determined using EPA Method 10.

3.8. **Volatile Organic Compounds (VOC):** 0.0230 g/kW-hr

3.8.1. For compliance with Condition C.3.8, measurement of VOC shall be determined using EPA Method 25A.

4. **Annual Emission Limits.** Emissions from all six generator engines in aggregate (Units FD-1 – 6) shall not exceed the emission limits specified for each of the pollutants below.

4.1. **Nitrogen oxides (NO_X):** 5.83 tons/rolling 12-month period

4.1.1. For compliance with Condition C.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Hourly Emission Limit.** Emissions from all six generation engines in aggregate (Units FD-1 –6) shall not exceed the emission limits specified for each of the pollutants below:

5.1. **Nitrogen oxides (NO_X):** 4.64 lb/hr

5.1.1. For compliance with Condition C.5.1, measurement of NO_X shall be determined using EPA Method 7E.

6. **Daily Emission Limits.** Emissions from all six generator engines in aggregate (Units FD-1 – 6) shall not exceed the emission limits specified for each of the pollutants below:

6.1. **Particulate Matter with an aerodynamic diameter less than 10 microns (PM_{10}):** 28.3 lbs/day

6.1.1. For compliance with Condition C.6, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

6.2. **Particulate Matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$):** 28.3 lbs/day

6.2.1. For compliance with Condition C.6.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

7. **Electrical Power Output Limit.** The permittee shall not operate Units FD-1 – 6 such that aggregate electrical power from the attached generators is in excess of 3,872 kWe for any hour that these emission units are operated.

8. **Stack Test Requirements.** The permittee shall stack test all of Units FD-1 – 6 as follows:

   8.1. At the start of the first drilling season that the Discoverer operates under this permit in the Beaufort Sea, all six of Units FD-1 – 6 shall have been stack tested under the requirements of this section.

   8.2. Each stack test shall be conducted at three different loads: 50 percent, 75 percent, and 100 percent.

   8.3. Each stack test run shall test for emissions of CO, NO_X, NO_2, $PM_{2.5}$, PM_{10}, VOC, ammonia, and visible emissions.

   8.4. During each test run, the permittee shall monitor and record the following information:

      8.4.1. Quantity of fuel used (in gallons);

      8.4.2. Density of the fuel used (in lbs/gallon);

      8.4.3. Heat content of the fuel used (in Btu/gallon);

      8.4.4. Electrical power produced (in kWe-hr);

      8.4.5. The stack temperature upstream of the SCR catalyst in ºC or ºF;

      8.4.6. The quantity of urea reagent (in gallons) and the concentration of the urea reagent (in weight percent) introduced into the SCR control system; and

      8.4.7. The NO_X concentration (ppm) indicated by the periodic NO_X monitor used for the SCR control system.

   8.5. For each engine, each load, and each pollutant, the permittee shall determine emission factors in the following units: g/kW-hr, g/kWe-hr, lbs/kW-hr, lbs/kWe-hr, and lbs/gallon.

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

   9.1. Equip each of the generator engines (Units FD-1 – 6) on board the Discoverer with a electrical output monitoring device:

      9.1.1. 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);

      9.1.2. Each electrical output monitoring device shall measure the electrical output of the generator attached to each engine at least once every 10 minutes; and

      9.1.3. Each electrical output monitoring device shall be equipped to record each reading taken as well as provide and record average loads for each hour.

   9.2. Maintain the accuracy of each electrical output monitoring device in accordance with manufacturer's recommendations.

9.3. Monitor and record the power output, in kWe, resulting from the operation of each of Units FD-1 – 6 at least once every 10 minutes.

9.4. Each month, calculate and record NO_X emissions in g/kW-hr from each engine for each hour during the month, using the emission factors collected under Condition C.8.5, and power output data collected under Condition C.9.3, and converted to kW (mechanical).

9.5. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and the emissions of $PM_{2.5}$ and PM_{10} in pounds per day from each engine by using the emission factors for each tested engine collected under Condition C.8.5 and electrical load data collected under Condition C.9.3, to determine emissions from that source. Emissions shall be calculated for each ten-minute load reading for each engine.

9.6. For the purposes of Conditions C.9.4 and C.9.5, 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 of the generator engines that have already been tested.

9.7. For the purposes of Condition C.9.5, 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 C.9.6.

9.8. For the purpose of Condition C.9.5, if either the urea pump is not operating or if the catalyst inlet temperature, measured in Condition B.28, is less than 250^{o}C, calculate emissions of NO_X for the affected time period by using an uncontrolled emission factor obtained by applying a 95 percent NO_X reduction efficiency to the emission factor determined pursuant to Condition C.8.5.

D. DISCOVERER PROPULSION ENGINE (FD-7)

1. The permittee shall not operate Unit FD-7 for any reason when operating the Discoverer as an OCS Source.

2. The permittee shall report to the EPA via facsimile or email, any deviation from Condition D.1 within 3 business days of identification.

E. DISCOVERER EMERGENCY GENERATOR AND SELDOM USED SOURCES (FD-8)

1. **Discoverer Seldom Used Sources.** For purposes of this permit, Discoverer seldom used sources means any fuel burning unit on the Discoverer except for the emergency generator and Units FD 1 – 7 and FD 9 – 22.

2. **Emergency Generator Reliability Testing Limits.** The permittee shall operate the emergency generator:

   2.1. For no more than 120 minutes during any one day;

   2.2. For no more than 10 hours during any drilling season; and

   2.3. The emergency generator shall only operate during the period of 12 pm to 2 pm.

3. **Fuel Usage Limit**. The permittee shall not use in excess of 150 gallons of fuel in aggregate in the Discoverer emergency generator and all Discoverer seldom used sources in any rolling 7-day period.

4. **Emergency Generator Hourly Emission Limits.** Emissions from the emergency generator shall not exceed the emission limits specified for each of the pollutants below:

   4.1. **Nitrogen oxides (NO_X):** 19.73 lb/hr

      4.1.1. For compliance with Condition E.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Emergency Generator Daily Emission Limits.** Emissions from the emergency generator shall not exceed the emission limits specified for each of the pollutants below:

   5.1. **PM_{10}:** 2.77 lbs/day

      5.1.1. For compliance with Condition E.5.1, measurement of PM_{10} shall be determined using EPA Method s 201A and 202.

   5.2. **$PM_{2.5}$:** 2.77 lbs/day

      5.2.1. For compliance with Condition E.5.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

6. **Monitoring, Recordkeeping and, Reporting.** For each instance in which the Discoverer emergency generator or each Discoverer seldom used source is operated while the Discoverer is an OCS Source, the permittee shall:

   6.1. Record the duration of the episode for the Discoverer emergency generator and each Discoverer seldom used source;

   6.2. Record the fuel consumption on a daily basis for the Discoverer emergency generator and each Discoverer seldom used source as provided in Condition B.6.4.2;

   6.3. Calculate and record for the previous 6 calendar days the a rolling 7-day fuel consumption for the Discoverer emergency generator and all Discoverer seldom used sources in aggregate by adding each day's fuel consumption to the total fuel consumed in the previous 6-calendar days;

   6.4. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and the emissions of $PM_{2.5}$ and PM_{10} in pounds per day from the emergency generator by multiplying an emission factor (0.587 lbs/gal for NO_X and 0.022 lbs/gal for $PM_{2.5}$ and PM_{10}) and recorded fuel use; and

6.5. The permittee shall report to the EPA via facsimile or email, any deviation from Conditions E.2 and E.3within 3 business days of identification.

7. **BACT Good Combustion Practices for NO_X, PM_{10}, $PM_{2.5}$, VOC, and CO (Carbon Monoxide).** The permittee shall:

7.1. Ensure that a full-time equipment maintenance specialist shall be on board at all times during operation as an OCS Source;

7.2. Train operating personnel to identify signs of improper operation and maintenance, including visible plumes, and to report these events to the maintenance specialist as soon as possible, but no later than within three hours of identification;

7.3. Have the maintenance specialist inspect, at least once each week, each emission unit for proper operation and maintenance consistent with the manufacturer's recommendations;

7.4. Ensure that the operation and maintenance manual provided by the manufacturer for each emission unit shall be kept on board the Discoverer at all times;

7.5. Follow the manufacturer's recommended operation and maintenance procedures for each of emission unit;

7.6. Maintain, on board the Discoverer, a log detailing when reporting, inspections and maintenance are conducted pursuant to Conditions E.7.2, E.7.3, and E.7.5, respectively; and

7.7. No less than 30 days prior to each deployment of the Discoverer to the Beaufort Sea, the permittee shall provide notice to the EPA on how the permittee shall comply with the requirements of Conditions E.7.1 and E.7.2 for the upcoming drilling season.

F. MUD LINE CELLAR COMPRESSOR ENGINES (FD-9 – 11)

1. **Operation of Oxidation Catalyst.** At all times that any of Units FD-9 – 11 are in operation, the exhaust from each emission unit shall be directed to an operating oxidation catalyst.

2. **BACT Limits.** Emissions from each MLC compressor engine (Units FD-9 – 11) shall not exceed the emission limits specified for each of the pollutants below:

2.1. **NO_X and non-methane hydrocarbons (NMHC), in aggregate:** 4.0 g/kW-hr

2.1.1. For compliance with Condition F.2.1, measurement of NO_X shall be determined using EPA Method 7E.

2.1.2. For compliance with Condition F.2.1, measurement of NMHC shall be determined using EPA Method 25A.

2.2. **PM:** 0.10 g/kW-hr

2.2.1. For compliance with Condition F.2.2, measurement of PM shall be determined using EPA Method 5.

2.3. **PM_{10}:** 0.10 g/kW-hr

2.3.1. For compliance with Condition F.2.3, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

2.4. **$PM_{2.5}$:** 0.10 g/kW-hr

2.4.1. For compliance with Condition F.2.4, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

2.5. **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

2.5.1. For compliance with Condition F.2.5, measurement of visible emissions shall be determined using EPA Method 9.

2.6. **CO:** 1.86 g/kW-hr

2.6.1. For compliance with Condition F.2.6, measurement of CO shall be determined using EPA Method 10.

3. **Annual Emission Limits.** Emissions from all three MLC compressor engines (Units FD-9 – 11) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

3.1. **NO_X:** 1.71 tons/rolling 12-month period

3.1.1. For compliance with Condition F.3.1, measurement of NO_X shall be determined using EPA Method 7E.

4. **Hourly Emission Limits.** Emissions from all three MLC compressor engines (Units FD-9 – 11) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

4.1. **NO_X:** 7.11 lbs/hour

4.1.1. For compliance with Condition F.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Daily Emission Limits.** Emissions from all three MLC compressor engine (Units FD-9 – 11) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

5.1. **PM_{10}:** 4.26 lbs/day

5.1.1. For compliance with Condition F.5.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

5.2. **$PM_{2.5}$:** 4.26 lbs/day

5.2.1. For compliance with Condition F.5.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

6. **Fuel Usage Limit.** The permittee shall not use in excess of 81,346 gallons of fuel in all three of Units FD-9 – 11 in aggregate during any rolling 12-month period.

7. **Stack Test Requirements.** The permittee shall stack test all of Units FD-9 – 11 as follows:

7.1. At the start of the first drilling season that the Discoverer operates under this permit in the Beaufort Sea, all three of Units FD-9 – 11 shall have been stack tested under the requirements of this section.

7.2. Each stack test shall be conducted for the following pollutants, and at the different loads specified:

7.2.1.	**CO**	at one load between 50 and 70 percent load;
7.2.2.	**NO_X**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
7.2.3.	**NO_2**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
7.2.4.	**NMHC**	at one load between 50 and 70 percent load;
7.2.5.	**$PM_{2.5}$**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
7.2.6.	**PM_{10}**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads; and
7.2.7.	**Visible emissions**	at one load between 50 and 70 percent load.

7.3. During each test run, the permittee shall monitor and record the following information:

7.3.1. Quantity of fuel used (in gallons);

7.3.2. Density of the fuel used (in lbs/gallon);

7.3.3. Heat content of the fuel used (in Btu/gallon); and

7.3.4. Mechanical power output (in kW).

7.4. For each engine, each load range, and each pollutant, the permittee shall determine emission factors in the following units: g/kW-hr, lbs/kW-hr, and lbs/gallon.

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

8.1. Equip each of Units FD-9 – 11 with a diesel fuel flow meter, or install a single fuel meter for all of Units FD-9 -11:

8.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

8.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

8.1.3. 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.

8.2. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

8.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

8.4. Monitor and record fuel usage for each engine on a hourly basis.

8.5. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and the emissions of $PM_{2.5}$ and PM_{10} in pounds per day using the highest emission factor collected under Condition F.7.4 and fuel usage data collected under Condition F.8.4.

G. HYDRAULIC POWER UNIT (HPU) ENGINES (FD-12 – 13)

1. **Operation of Catalyzed Diesel Particulate Filter (CDPF).** At all times that any of Units FD-12 – 13 are in operation, the exhaust from each emission unit shall be directed to an operating CleanAIR Systems CDPF, Part No. FDA300.

1.1. Each CDPF shall be equipped with an operating HiBACK monitor and alarm unit, that records exhaust pressure and temperature.

1.2. During each day that each of Units FD-12 – 13 is operated, the exhaust temperature shall be above 300°C, or 572°F for at least 30 percent of the time.

2. **BACT Limits**. Emissions from each HPU engine (Units FD-12 – 13) shall not exceed the emission limits specified for each of the pollutants below:

2.1. **NO_X and NMHC, in aggregate:** 4.0 g/kW-hr

2.1.1. For compliance with Condition G.2.1, measurement of NO_X shall be determined using EPA Method 7E.

2.2. **PM:** 0.030 g/kW-hr

2.2.1. For compliance with Condition G.2.2, measurement of PM shall be determined using EPA Method 5.

2.3. **PM_{10}:** 0.030 g/kW-hr

2.3.1. For compliance with Condition G.2.3, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

2.4. **$PM_{2.5}$:** 0.030 g/kW-hr

2.4.1. For compliance with Condition G.2.4, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

2.5. **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

2.5.1. For compliance with Condition G.2.5, measurement of visible emissions shall be determined using EPA Method 9.

2.6. **CO:** 0.70 g/kW-hr

2.6.1. For compliance with Condition G.2.6, measurement of CO shall be determined using EPA Method 10.

3. **BACT Good Combustion Practices for NO_X.** The permittee shall:

3.1. Ensure that a full-time equipment maintenance specialist shall be on board at all times during operation as an OCS Source;

3.2. Train operating personnel to identify signs of improper operation and maintenance, including visible plumes, and to report these events to the maintenance specialist as soon as possible, but no later than within three hours of identification;

3.3. Have the maintenance specialist inspect, at least once each week, each of Units FD-12 – 13 for proper operation and maintenance consistent with the manufacturer's recommendations;

3.4. Ensure that the operation and maintenance manual provided by the manufacturer for each of Units FD-12 – 13 shall be kept on board the Discoverer at all times;

3.5. Follow the manufacturer's recommended operation and maintenance procedures for each of Units FD-12 – 13;

3.6. Maintain, on board the Discoverer, a log detailing when reporting, inspections and maintenance are conducted pursuant to Conditions G.3.2, G.3.3, and G.3.5, respectively; and

3.7. No less than 30 days prior to each deployment of the Discoverer to the Beaufort Sea, the permittee shall provide notice to the EPA on how the permittee shall comply with the requirements of Conditions G.3.1 and G.3.2 for the upcoming drilling season.

4. **Annual Emission Limits.** Emissions from both HPU engines (Units FD-12 – 13) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

4.1. **NO_X:** 0.79 tons/rolling 12-month period

4.1.1. For compliance with Condition G.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Hourly Emission Limits.** Emissions from both HPU engines (Units FD-12 – 13) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

   5.1. **NO_X:** 3.29 lbs/hour

      5.1.1. For compliance with Condition G.5.1, measurement of NO_X shall be determined using EPA Method 7E.

6. **Daily Emission Limits.** Emissions from both HPU engines (Units FD-12 – 13) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

   6.1. **PM_{10}:** 0.59 lbs/day

      6.1.1. For compliance with Condition G.6.1, measurement of PM_{10} shall be determined using EPA Methods 201A and202.

   6.2. **$PM_{2.5}$:** 0.59 lbs/day

      6.2.1. For compliance with Condition G.6.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and202.

7. **Annual Fuel Usage Limit.** The permittee shall not use in excess of 44,338 gallons of fuel in both of Units FD-12 – 13 in aggregate during any rolling 12-month period.

8. **Daily Fuel Usage Limits/Alternative Operating Scenarios.** Units FD-12, FD-13 and FD-23 shall be operated under one of three operating scenarios: Base Operating Scenario, Alternative Operating Scenario #1 or Alternative Operating Scenario #2. The permittee shall not use fuel in excess of the following limits while operating under the operating scenarios:

   8.1. Under Base Operating Scenario, the permittee shall not operate either of Units FD-12 – 13;

   8.2. Under Alternative Operating Scenario #1, the permittee shall not use in excess of 352 gallons of fuel in both of Units FD-12 – 13 in aggregate during any calendar day;

   8.3. Under Alternative Operating Scenario #2, the permittee shall not use in excess of 704 gallons of fuel in both of Units FD-12 – 13 in aggregate during any calendar day; and

   8.4. For each calendar day that the permittee intends to operate under either of Alternative Operating Scenarios #1 or 2, the permittee shall record in a log, at the beginning of the calendar day, which scenario it will be operating under for the day. In the absence of a log entry, the permittee shall comply with the requirements applicable to the Base Operating Scenario.

9. **Stack Test Requirements.** The permittee shall stack test both of Units FD-12 – 13 as follows:

   9.1. At the start of the first drilling season that the Discoverer operates under this permit in the Beaufort Sea, both of Units FD-12 – 13 shall have been stack tested under the requirements of this section.

9.2. Each stack test shall be conducted for the following pollutants, and at the different loads specified:

9.2.1.	**CO**	at one load between 50 and 70 percent load;
9.2.2.	**NO_X**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.3.	**NO_2**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.4.	**$PM_{2.5}$**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.5.	**PM_{10}**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.6.	**VOC**	at one load between 50 and 70 percent load; and
9.2.7.	**Visible emissions**	at one load between 50 and 70 percent load.

9.3. During each test run, the permittee shall monitor and record the following information:

9.3.1. Quantity of fuel used (in gallons);

9.3.2. Density of the fuel used (in lbs/gallon);

9.3.3. Heat content of the fuel used (in Btu/gallon); and

9.3.4. Mechanical power output (in kW).

9.4. For each engine, each load range, and each pollutant, the permittee shall determine emission factors in the following units: g/kW-hr, lbs/kW-hr and lbs/gallon.

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

10.1. Equip each of Units FD-12 – 13 with a diesel fuel flow meter, or install a single fuel meter for both of Units FD-12 - 13:

10.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

10.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

10.1.3. 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.

10.2. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

10.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

10.4. Monitor and record fuel usage for each engine on a hourly basis.

10.5. Monitor the exhaust temperature of each engine by use of the HiBACK monitor and alarm unit, whenever the engine is in operation.

10.6. Each day, calculate and record for the previous calendar day, the percent of operational time for each engine that the exhaust temperature was above 300^{o}C (572^{o}F).

10.7. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and the emissions of $PM_{2.5}$ and PM_{10} in pounds per day using the highest emission factor collected under Condition G.9.4 and fuel usage data collected under Condition G.10.4.

H. DECK CRANES (FD-14 – 15)

1. **Operation of Catalyzed Diesel Particulate Filter (CDPF).** At all times that any of Units FD-14 – 15 in operation, the exhaust from each emission unit shall be directed to an operating CleanAIR Systems CDPF, Part No. 07040401AF.

1.1. Each CDPF shall be equipped with an operating HiBACK monitor and alarm unit, that records exhaust pressure and temperature.

1.2. During each day that each of Units FD-14 -15 is operated, the exhaust temperature shall be above 300^{o}C, or 572^{o}F, for at least 30 percent of the time.

2. **BACT Limits.** Emissions from each deck crane engine (Units FD-14 – 15) shall not exceed the emission limits specified for each of the pollutants below:

2.1. **NO_X:** 10.327 g/kW-hr

2.1.1. For compliance with Condition H.2.1, measurement of NO_X shall be determined using EPA Method 7E.

2.2. **PM:** 0.0715 g/kW-hr

2.2.1. For compliance with Condition H.2.2, measurement of PM shall be determined using EPA Method 5.

2.3. **PM_{10}:** 0.0715 g/kW-hr

2.3.1. For compliance with Condition H.2.3, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

2.4. **$PM_{2.5}$:** 0.0715 g/kW-hr

2.4.1. For compliance with Condition H.2.4, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

2.5. **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

2.5.1. For compliance with Condition H.0, measurement of visible emissions shall be determined using EPA Method 9.

2.6. **CO:** 0.220 g/kW-hr

2.6.1. For compliance with Condition H.2.6, measurement of CO shall be determined using EPA Method 10.

2.7. **VOC:** 0.0640 g/kW-hr

2.7.1. For compliance with Condition H.2.7, measurement of VOC shall be determined using EPA Method 25A.

3. **BACT Good Combustion Practices for NO_X.** The permittee shall:

3.1. Ensure that a full-time equipment maintenance specialist shall be on board at all times during operation as an OCS Source;

3.2. Train operating personnel to identify signs of improper operation and maintenance, including visible plumes, and to report these events to the maintenance specialist as soon as possible, but no later than within three hours of identification;

3.3. Have the maintenance specialist inspect, at least once each week, each of Units FD-14 – 15 for proper operation and maintenance consistent with the manufacturer's recommendations;

3.4. Ensure that the operation and maintenance manual provided by the manufacturer for each of Units FD-14 – 15 shall be kept on board the Discoverer at all times;

3.5. Follow the manufacturer's recommended operation and maintenance procedures for each of Units FD-14 – 15;

3.6. Maintain, on board the Discoverer, a log detailing when reporting, inspections and maintenance are conducted pursuant to Conditions H.3.2, H.3.3, and H.3.5 respectively; and

3.7. No less than 30 days prior to initial deployment of the Discoverer to the Beaufort Sea, the permittee shall provide notice to the EPA on how the permittee shall comply with the requirements of Conditions H.3.1 and H.3.2 for the upcoming drilling season.

4. **Annual Emission Limits.** Emissions from both deck crane engines (Units FD-14 – 15) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

4.1. **NO_X:** 2.76 tons/rolling 12-month period

4.1.1. For compliance with Condition H.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Hourly Emission Limits.** Emissions from both deck cranes engines (Units FD-14 – 15) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

5.1. **NO_X:** 2.48 lbs/hour

5.1.1. For compliance with Condition H.5.1 measurement of NO_X shall be determined using EPA Method 7E.

6. **Daily Emission Limits.** Emissions from both deck crane engines (Units FD-14 – 15) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

6.1. **PM_{10}:** 0.41 lbs/day

6.1.1. For compliance with Condition H.6.1, measurement of PM_{10} shall be determined using EPA Methods 201A 202.

6.2. **$PM_{2.5}$:** 0.41 lbs/day

6.2.1. For compliance with Condition H.6.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

7. **Fuel Usage Limit.** The permittee shall not use in excess of 63,661 gallons of fuel in both of Units FD-14 – 15 in aggregate during any rolling 12-month period.

8. **Stack Test Requirements.** The permittee shall stack test both of Units FD-14 – 15 as follows:

8.1. At the start of the first drilling season that the Discoverer operates under this permit in the Beaufort Sea, both of Units FD-14 – 15 shall have been stack tested under the requirements of this section.

8.2. Each stack test shall be conducted for the following pollutants, and at the different loads specified:

7.1.1	**CO**	at one load between 60 and 80 percent load;
7.1.2	**NO_X**	at two loads – between 60 and 80 percent and between 80 and 100 percent loads;
7.1.3	**NO_2**	at two loads – between 60 and 80 percent and between 80 and 100 percent loads;
7.1.4	**$PM_{2.5}$**	at two loads – between 60 and 80 percent and between 80 and 100 percent loads;
7.1.5	**PM_{10}**	at two loads – between 60 and 80 percent and between 80 and 100 percent loads;
7.1.6	**VOC**	at one load between 60 and 80 percent load; and
7.1.7	**Visible emissions**	at one load between 60 and 80 percent load.

8.3. During each test run, the permittee shall monitor and record the following information:

8.3.1. Quantity of fuel used (in gallons);

8.3.2. Density of the fuel used (in lbs/gallon);

8.3.3. Heat content of the fuel used (in Btu/gallon); and

8.3.4. Mechanical power output (in kW).

8.4. For each engine, each load range, and each pollutant, the permittee shall determine emission factors in the following units: g/kW-hr, lbs/kW-hr and lbs/gallon.

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

9.1. Equip each of Units FD-14 -15 with a diesel fuel flow meter or install a single fuel meter for both of Units FD-14 - 15:

9.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

9.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

9.1.3. 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.

9.2. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

9.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

9.4. Monitor and record fuel usage for each engine on a hourly basis.

9.5. Monitor and record the exhaust temperature of each engine by use of the HiBACK monitor and alarm unit, while the engine is in operation.

9.6. Each day, calculate and record for the previous calendar day, the percent of operational time for each engine that the exhaust temperature was above 300^{o}C (572^{o}F).

9.7. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pound per day and the emissions of $PM_{2.5}$ and PM_{10} in pounds per day, using the highest emission factor collected under Condition H.8.4 and fuel usage data collected under Condition H.9.4 .

I. CEMENTING UNIT AND LOGGING WINCH ENGINES (FD-16 – 20)

1. **Operation of Catalyzed Diesel Particulate Filter (CDPF).** At all times that any of the cementing unit and logging winch engines (Units FD-16 – 20) are in operation, the exhaust from each emission unit shall be directed to operating CleanAIR Systems CDPF, Part No. FDA300 for Units FD-16 and 17, Part No. FDA225 for Unit FD-18, and as specified by CleanAIR Systems for Units FD-19 – 20.

1.1. Each CDPF shall be equipped with an operating HiBACK monitor and alarm unit, that records exhaust pressure and temperature.

1.2. During each day that each of Units FD-16 – 20 is operated, the exhaust temperature shall be above 300°C, or 572°F, for at least 30 percent of the time.

2. **BACT Limits.** Emissions from each of Units FD-16 – 20 shall not exceed the emission limits specified for each of the pollutants below:

2.1. **NO_X:**

FD-16	13.155	g/kW-hr
FD-17	13.155	g/kW-hr
FD-18	15.717	g/kW-hr
FD-19	4.0	g/kW-hr
FD-20	7.50	g/kW-hr

2.1.1. For compliance with Condition I.2.1, measurement of NO_X shall be determined using EPA Method 7E.

2.2. **PM:**

FD-16	0.253	g/kW-hr
FD-17	0.253	g/kW-hr
FD-18	0.386	g/kW-hr
FD-19	0.03	g/kW-hr
FD-20	0.090	g/kW-hr

2.2.1. For compliance with Condition I.2.2, measurement of PM shall be determined using EPA Method 5.

2.3. **PM_{10}:**

FD-16	0.253	g/kW-hr
FD-17	0.253	g/kW-hr
FD-18	0.386	g/kW-hr
FD-19	0.03	g/kW-hr
FD-20	0.090	g/kW-hr

2.3.1. For compliance with Condition I.2.3, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

2.4. **$PM_{2.5}$:**

FD-16	0.253	g/kW-hr
FD-17	0.253	g/kW-hr
FD-18	0.386	g/kW-hr
FD-19	0.03	g/kW-hr
FD-20	0.090	g/kW-hr

2.4.1. For compliance with Condition I.2.4, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

2.5. **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

2.5.1. For compliance with Condition I.0, measurement of visible emissions shall be determined using EPA Method 9.

2.6. **CO:**

FD-16	0.40	g/kW-hr
FD-17	0.40	g/kW-hr
FD-18	0.880	g/kW-hr
FD-19	0.70	g/kW-hr
FD-20	0.550	g/kW-hr

2.6.1. For compliance with Condition I.2.6, measurement of CO shall be determined using EPA Method 10.

2.7. **VOC:**

FD-16	0.20	g/kW-hr
FD-17	0.20	g/kW-hr
FD-18	0.270	g/kW-hr
FD-19	4.0	g/kW-hr
FD-20	0.750	g/kW-hr

2.7.1. For compliance with Condition I.2.7, measurement of VOC shall be determined using EPA Method 25A.

3. **BACT Good Combustion Practices for NO_X.** The permittee shall:

3.1. Ensure that a full-time equipment maintenance specialist shall be on board at all times during operation as an OCS Source;

3.2. Train operating personnel to identify signs of improper operation and maintenance, including visible plumes, and to report these events to the maintenance specialist as soon as possible, but no later than within three hours of identification;

3.3. Have the maintenance specialist inspect, at least once each week, each of Units FD-16 – 20 for proper operation and maintenance consistent with the manufacturer's recommendations;

3.4. Ensure that the operation and maintenance manual provided by the manufacturer for each of Units FD-16 – 20 shall be kept on board the Discoverer at all times;

3.5. Follow the manufacturer's recommended operation and maintenance procedures for each of Units FD-16 – 20;

3.6. Maintain, on board the Discoverer, a log detailing when reporting, inspections and maintenance are conducted pursuant to Conditions I.3.2, I.3.3 and I.3.5 respectively; and

3.7. No less than 30 days prior to initial deployment of the Discoverer to the Beaufort Sea, the permittee shall provide notice to the EPA on how the permittee shall comply with the requirements of Conditions I.3.1 and I.3.2 for the upcoming drilling season.

4. **Annual Emission Limits.** Emissions from all cementing unit and logging winch engines (Units FD-16 – 20) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

4.1. **NO_X:** 4.09 tons/rolling 12-month period

4.1.1. For compliance with Condition I.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Hourly Emission Limits.** Emissions from all cementing unit and logging winch engines (Units FD-16 - 20) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

5.1. **NO_X:** 6.56 lbs/hour

5.1.1. For compliance with Condition I.5.1, measurement of NO_X shall be determined using EPA Method 7E.

6. **Daily Emission Limits.** Emissions from all cementing unit and logging winch engines (Units FD-16 – 20) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

6.1. **PM_{10}:** 3.87 lbs/day

6.1.1. For compliance with Condition I.6.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

6.2. **$PM_{2.5}$:** 3.87 lbs/day

6.2.1. For compliance with Condition I.6.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and202.

7. **Fuel Usage Limit.** The permittee shall not use in excess of:

7.1. 53,760 gallons of fuel in all Units FD-16 – 20 in aggregate during any rolling 12-month period; and

7.2. 320 gallons of fuel in all Units FD-16 – 20 in aggregate during any calendar day.

8. **Operational Limit.** The permittee shall not operate any cementing unit or logging winch engines (unit FD-16 – 20) while conducting MLC activities as defined in Condition B.2.3.

9. **Stack Test Requirements.** The permittee shall stack test all of Units FD-16 – 20 as follows:

9.1. At the start of the first drilling season that the Discoverer operates under this permit in the Beaufort Sea, all of Units FD-16 – 20 shall have been stack tested under the requirements of this section.

9.2. Each stack test shall be conducted for the following pollutants, and at the different loads specified:

9.2.1.	**CO**	at one load between 50 and 70 percent load;
9.2.2.	**NO_X**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.3.	**NO_2**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.4.	**$PM_{2.5}$**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.5.	**PM_{10}**	at two loads – between 50 and 70 percent and between 80 and 100 percent loads;
9.2.6.	**VOC**	at one load between 50 and 70 percent load; and
9.2.7.	**Visible emissions**	at one load between 50 and 70 percent load.

9.3. During each test run, the permittee shall monitor and record the following information:

9.3.1. Quantity of fuel used (in gallons);

9.3.2. Density of the fuel used (in lbs/gallon);

9.3.3. Heat content of the fuel used (in Btu/gallon); and

9.3.4. Mechanical power output (in kW).

9.4. For each engine, each load range, and each pollutant, the permittee shall determine emission factors in the following units: g/kW-hr, lbs/kW-hr and lbs/gallon.

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

10.1. Equip each of Units FD-16 – 20 with a diesel fuel flow meter or install a single fuel meter for all of Units FD-16 - 20:

10.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

10.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

10.1.3. 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.

10.2. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

10.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

10.4. Monitor and record fuel usage for each engine on a hourly basis.

10.5. Monitor and record the exhaust temperature of each of engines FD-16 – 20 by use of the HiBACK monitor and alarm unit, while the engine is in operation.

10.6. Each day, for each of engines FD-16 – 20, calculate and record for the previous calendar day, the percent of operational time for each engine that the exhaust temperature was above 300°C (572°F).

10.7. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and the emissions from $PM_{2.5}$ and PM_{10} in pounds per day, using the highest emission factor collected under Condition I.9.4 and fuel usage data collected under Condition I.10.4.

J. HEAT BOILERS (FD-21 – 22)

1. **BACT Limits.** Emissions from each of the heat boilers (Units FD-21 – 22) shall not exceed the emission limits specified for each of the pollutants below:

1.1. **NO_X:** 0.20 lbs/MMBtu

1.1.1. For compliance with Condition J.1.1, measurement of NO_X shall be determined using EPA Method 7E.

1.2. **PM:** 0.0235 lbs/MMBtu

1.2.1. For compliance with Condition J.1.2, measurement of PM shall be determined using EPA Method 5.

1.3. **PM_{10}:** 0.0235 lbs/MMBtu

1.3.1. For compliance with Condition J.1.3, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

1.4. **$PM_{2.5}$:** 0.0235 lbs/MMBtu

1.4.1. For compliance with Condition J.1.4, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

1.5. **Visible Emissions:** Visible emissions, excluding condensed water vapor, shall not reduce visibility through the exhaust effluent more than 20 percent averaged over any six consecutive minutes.

1.5.1. For compliance with Condition J.1.5, measurement of visible emissions shall be determined using EPA Method 9.

1.6. **CO:** 0.0770 lbs/MMBtu

1.6.1. For compliance with Condition J.0, measurement of CO shall be determined using EPA Method 10.

1.7. **VOC:** 0.00140 lbs/MMBtu

1.7.1. For compliance with Condition J.1.7, measurement of VOC shall be determined using EPA Method 25A.

2. **BACT Good Combustion Practices for NO_X, PM, $PM_{2.5}$, PM_{10}, CO, and VOC.** The permittee shall:

2.1. Ensure that a full-time equipment maintenance specialist shall be on board at all times during operation as an OCS Source;

2.2. Train operating personnel to identify signs of improper operation and maintenance, including visible plumes, and to report these events to the maintenance specialist as soon as possible, but no later than within three hours of identification;

2.3. Have the maintenance specialist inspect, at least once each week, each of Units FD-21 – 22 for proper operation and maintenance consistent with the manufacturer's recommendations;

2.4. Ensure that the operation and maintenance manual provided by the manufacturer for each of Units FD-21 – 22 shall be kept on board the Discoverer at all times;

2.5. Follow the manufacturer's recommended operation and maintenance procedures for each of Units FD-21 – 22;

2.6. Maintain, on board the Discoverer, a log detailing when reporting, inspections and maintenance are conducted pursuant to Conditions J.2.2, J.2.3, and J.2.5 respectively; and

2.7. No less than 30 days prior to initial deployment of the Discoverer to the Beaufort Sea, the permittee shall provide notice to the EPA on how the permittee shall comply with the requirements of Conditions J.2.1 and J.2.2 for the upcoming drilling season.

3. **Annual Emission Limits.** Emissions from all heat boilers (Units FD-21 – 22) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

3.1. **NO_X:** 4.59 tons/rolling 12-month period

3.1.1. For compliance with Condition J.3.1, measurement of NO_X shall be determined using EPA Method 7E.

4. **Hourly Emission Limits.** Emissions from all heat boilers (Units FD-21 – 22) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

4.1. **NO_X:** 3.19 lbs/hour

4.1.1. For compliance with Condition J.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Daily Emission Limits.** Emissions from all heat boilers (Units FD-21 – 22) in aggregate shall not exceed the emission limits specified for each of the pollutants below:

5.1. **PM_{10}:** 8.99 lbs/day

5.1.1. For compliance with Condition J.5.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

5.2. **$PM_{2.5}$:** 8.99 lbs/day

5.2.1. For compliance with Condition J.5.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

6. **Stack Test Requirements.** The permittee shall stack test both of Units FD-21 – 22 as follows:

6.1. At the start of the first drilling season that the Discoverer operates under this permit in the Beaufort Sea, both of Units FD-21 – 22 shall have been stack tested under the requirements of this section.

6.2. Each stack test shall be conducted for the following pollutants, and at the different loads specified:

6.2.1. **CO** at 100 percent load;

6.2.2. **NO_X** at 50 percent and 100 percent loads;

6.2.3. **NO_2** at 50 percent and 100 percent loads;

6.2.4. **$PM_{2.5}$** at 50 percent and 100 percent loads;

6.2.5. **PM_{10}** at 50 percent and 100 percent loads;

6.2.6. **VOC** at 100 percent load; and

6.2.7. **Visible emissions** at 100 percent load.

6.3. During each test run, the permittee shall monitor and record the following information:

6.3.1. Quantity of fuel used (in gallons);

6.3.2. Density of the fuel used (in lbs/gallon); and

6.3.3. Heat content of the fuel used (in Btu/gallon).

6.4. For each boiler, each load range and each pollutant, the permittee shall determine emission factors in the following units: lbs/MMBtu and lbs/gallon.

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

7.1. Equip each of Units FD-21 – 22 with a diesel fuel flow meter or install a single fuel meter for both of Units FD-21 – 22:

7.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the boiler(s) or boiler group being served by the meter;

7.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

7.1.3. 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.

7.2. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

7.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

7.4. Monitor and record fuel usage for each boiler on a hourly basis.

7.5. Each day, calculate and record for the previous calendar day, the emissions of NO_X, $PM_{2.5}$ and PM_{10} using the highest emission factor collected under Condition J.6.4 and fuel usage data collected under Condition J.7.4.

K. WASTE INCINERATOR (FD-23)

1. **BACT Limits.** Emissions from the incinerator (Unit FD-23) shall not exceed the emission limits specified for each of the pollutants below:

1.1. **NO_X:** 5.0 lbs/ton of waste incinerated

1.1.1. For compliance with Condition K.1.1, measurement of NO_X shall be determined using EPA Method 7E.

1.2. **PM:** 8.20 lbs/ ton of waste incinerated

1.2.1. For compliance with Condition K.1.2, measurement of PM shall be determined using EPA Method 5.

1.3. **PM_{10}:** 8.20 lbs/ton of waste incinerated

1.3.1. For compliance with Condition K.1.3, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

1.4. **$PM_{2.5}$:** 7.00 lbs/ton of waste incinerated

1.4.1. For compliance with Condition K.1.4, measurement of $PM_{2.5}$ shall be determined using OTM 27 and EPA Methods 201A and 202.

1.5. **CO:** 31.0 lbs/ton of waste incinerated

1.5.1. For compliance with Condition K.1.5, measurement of CO shall be determined using EPA Method 10.

1.6. **VOC:** 3.0 lbs/ton of waste incinerated

1.6.1. For compliance with Condition K.1.6, measurement of VOC shall be determined using EPA Method 25A.

2. **BACT Good Combustion Practices for NO_X, PM, $PM_{2.5}$, PM_{10}, CO, and VOC.** The permittee shall:

   2.1. Ensure that a full-time equipment maintenance specialist shall be on board at all times during operation as an OCS Source;

   2.2. Train operating personnel to identify signs of improper operation and maintenance, including visible plumes, and to report these events to the maintenance specialist as soon as possible, but no later than within three hour of identification;

   2.3. Have the maintenance specialist inspect, at least once each week, Unit FD-23 for proper operation and maintenance consistent with the manufacturer's recommendations;

   2.4. Ensure that the operation and maintenance manual provided by the manufacturer for Unit FD-23 shall be kept on board the Discoverer at all times;

   2.5. Follow the manufacturer's recommended operation and maintenance procedures for Unit FD-23;

   2.6. Maintain, on board the Discoverer, a log detailing when reporting, inspections and maintenance are conducted pursuant to Conditions K.2.2, K.2.3, and K.2.5 respectively; and

   2.7. No less than 30 days prior to initial deployment of the Discoverer to the Beaufort Sea, the permittee shall provide notice to the EPA on how the permittee shall comply with the requirements of Conditions K.2.1 and K.2.2 for the upcoming drilling season.

3. **Annual Emission Limits.** Emissions from the incinerator (Unit FD-23) shall not exceed the emission limits specified for each of the pollutants below:

   3.1. **NO_X:** 0.20 tons/rolling 12-month period

      3.1.1. For compliance with Condition K.3.1, measurement of NO_X shall be determined using EPA Method 7E.

4. **Hourly Emission Limits.** Emissions from the incinerator (Unit FD-23) shall not exceed the emission limits specified for each of the pollutants below:

   4.1. **NO_X:** 0.65 lb/hr

      4.1.1. For compliance with Condition K.4.1, measurement of NO_X shall be determined using EPA Method 7E.

5. **Daily Emission Limits.** Emissions from the incinerator (Unit FD-23) shall not exceed the emission limits specified for each of the pollutants below:

   5.1. **PM_{10}:** 5.33 lbs/day

      5.1.1. For compliance with Condition K.5.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

   5.2. **$PM_{2.5}$:** 4.55 lbs/day

      5.2.1. For compliance with Condition K.5.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

6. **Throughput-Based Emission Limits.** Emissions from the incinerator (Unit FD-23) shall not exceed the emission limits specified for each of the pollutants below:

6.1. **PM_{10}:** 8.20 lbs/ton of waste incinerated

6.1.1. For compliance with Condition K.6.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

6.2. **$PM_{2.5}$:** 7.00 lbs/ton of waste incinerated

6.2.1. For compliance with Condition K.6.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

6.3. **SO_2:** 2.50 lbs/ton of waste incinerated

6.3.1. For compliance with Condition K.6.3, measurement of SO_2 shall be determined using EPA Method 6C.

7. **Annual Waste Throughput Limit.** The permittee shall not incinerate in excess of 50,400 lbs of all types of waste in Unit FD-23 during any rolling 12-month period.

8. **Daily Fuel Usage Limits/Alternative Operating Scenarios.** Units FD-12, FD-13 and FD-23 shall be operated under one of three operating scenarios: Base Operating Scenario, Alternative Operating Scenario #1 or Alternative Operating Scenario #2. The permittee shall not incinerate waste in excess of the following limits while operating under the operating scenarios:

8.1. Under Base Operating Scenario, the permittee shall not incinerate in excess of 1300 lbs of waste during any calendar day;

8.2. Under Alternative Operating Scenario #1, the permittee shall not incinerate in excess of 800 lbs of waste during any calendar day;

8.3. Under Alternative Operating Scenario #2, the permittee shall not incinerate in excess of 300 lbs of waste during any calendar day; and

8.4. For each calendar day that the permittee intends to operate under either of Alternative Operating Scenarios #1 or 2, the permittee shall record as specified in Condition G.8.4.

9. **Waste Segregation Work Practice.** The permittee shall develop and implement a written waste segregation work practice plan to ensure that non-combustible items containing heavy metals that could be volatilized and emitted from the incinerator as PM are not introduced into the incinerator. The plan shall be submitted to the EPA Region 10 at least 30 days prior to initial deployment of the Discoverer to the Beaufort Sea.

10. **Stack Test Requirements.** Prior to each of the first three drilling seasons that the Discoverer operates under this permit in the Beaufort Sea, the permittee shall stack test the incinerator (Unit FD-23) as follows:

10.1. Each stack test shall be conducted at full rated capacity.

10.2. For the first drilling season, each stack test run shall test for emissions of CO, NO_X, NO_2, $PM_{2.5}$, PM_{10}, SO_2, and VOC.

10.3. For subsequent drilling seasons, each stack test run shall test for emissions of NO_X, NO_2, $PM_{2.5}$, PM_{10}, and SO_2.

10.4. During each test run, the permittee shall monitor and record the following information:

10.4.1. Quantity of fuel used (in gallons);

10.4.2. Density of the fuel used (in lbs/gallon);

10.4.3. Heat content of the fuel used (in Btu/gallon);

10.4.4. Quantity of waste incinerated (tons); and

10.4.5. Type of waste incinerated.

10.5. For each pollutant, the permittee shall determine emission factors in the following units: lbs/ton of waste incinerated.

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

11.1. For each batch of waste charged to the incinerator:

11.1.1. Record the date and time that each batch of waste was charged to the incinerator;

11.1.2. Weigh the batch of waste by using a weigh scale used that shall be accurate to within 0.5 lbs; and

11.1.3. Record the weight of each batch of waste charged to the incinerator.

11.2. 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 the weigh scale to determine its accuracy. Submit this information to the EPA no less than 30 days prior to operation within the Beaufort Sea.

11.3. Maintain the accuracy of the weigh scale in accordance with manufacturer's recommendations.

11.4. Monitor and record the exhaust temperature of the incinerator at least every 15 minutes.

11.5. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and emissions of $PM_{2.5}$ and PM_{10} in pounds per day using the highest emission factor collected under Condition K.10.5 and waste material incinerated throughput collected under Condition K.11.1.

12. **COA Regulations: Incinerator Visible Emissions.** The permittee shall comply with the following.

12.1. Do not cause or allow visible emissions, excluding condensed water vapor, through the exhaust of Unit FD-23, to reduce visibility by more than 20 percent averaged over any six consecutive minutes.

12.2. Observe, record, and report the exhaust of Unit FD-23 using the visible emission monitoring, recordkeeping, and reporting Conditions B.10 through B.12.

L. SUPPLY SHIP GENERATOR ENGINE (FD-31)

1. **Operational Limits**. For events where the supply ship is attached to the Discoverer, the permittee shall:

   1.1. Not use in excess of 184.0 gallons of fuel per day in the non-propulsion generators (not including the emergency engine), in aggregate; and

   1.2. Not use in excess of 1472.0 gallons of fuel during any rolling 12-month period in the non-propulsion generators (not including the emergency engine), in aggregate.

2. **Annual Emission Limits.** For events where the supply ship is attached to the Discoverer, emissions from operation of the supply ship generator engine (Unit FD-31) shall not exceed the emission limits specified for each of the pollutants below:

   2.1. **NO_X:** 0.43 tons/rolling 12-month period

      2.1.1. For compliance with Condition L.2.1, measurement of NO_X shall be determined using EPA Method 7E.

3. **Daily Emission Limits.** For events where the supply ship is attached to the Discoverer, emissions from operation of the supply ship generator engine (Unit FD-31) shall not exceed the emission limits specified for each of the pollutants below:

   3.1. **PM_{10}:** 7.60 lbs/day

      3.1.1. For compliance with Condition L.3.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

   3.2. **$PM_{2.5}$:** 7.60 lbs/day

      3.2.1. For compliance with Condition L.3.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

4. **Stack Test Requirements.** Prior to the first supply ship trip of each drilling season to resupply the Discoverer while the Discoverer is operating under this permit in the Beaufort Sea, the permittee shall stack test the supply ship generator engine (Unit FD-31) as follows:

   4.1. If the generator from the intended supply ship has already been tested pursuant to Conditions L.4.2 through L.4.5 during the past 5 years, no additional stack testing is required.

   4.2. Each stack test shall be conducted at 100 percent load.

   4.3. Each stack test run shall test for emissions of NO_X, NO_2, $PM_{2.5}$, and PM_{10}.

   4.4. During each test run, the permittee shall monitor and record the following information:

      4.4.1. Manufacturer and model no. of the engine;

      4.4.2. The rated capacity of the engine (in hp);

      4.4.3. Quantity of fuel used (in gallons);

4.4.4. Density of the fuel used (in lbs/gallon);

4.4.5. Heat content of the fuel used (in Btu/gallon); and

4.4.6. Electrical power output (in kWe).

4.5. 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.

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

5.1. Equip each of the non-propulsion generator engines (not including the emergency engine) with a diesel fuel flow meter, or install a single fuel meter for all of these engines:

5.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

5.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

5.1.3. 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.

5.2. No less than 60 days before the first deployment to the Beaufort Sea of a vessel as the supply ship, collect information from the manufacturer of each fuel flow meter so as to determine its accuracy. Submit this information to the EPA no less than 30 days prior to departure of the supply vessel to the Beaufort Sea.

5.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

5.4. Monitor and record fuel usage for the non-propulsion generators on a hourly basis while the supply vessel is attached to the Discoverer.

5.5. For each event, record the date and time that the supply ship attaches to the Discoverer.

5.6. For each event, record the date and time that the supply ship detaches from the Discoverer.

5.7. For each event, record the manufacturer, model no. and rated capacity (in hp) of the supply ship generator engine.

5.8. For each event, calculate daily emissions of NO_X, $PM_{2.5}$, and PM_{10} using the highest emission factor collected under Condition L.4.5 and fuel usage data collected under Condition L.5.4

6. **Supply Ship Events.** The total number of events during which the supply ship transits to and from the Discoverer and either attaches to the Discoverer or operates in dynamic positioning mode shall not exceed 8 in any drilling season.

7. **Supply Barge and Tug Alternative.** If a supply barge and tug is used in lieu of the supply ship the permittee shall not operate any emission units on the supply barge when it

is attached to the Discoverer. At no time shall the supply barge tug be attached to the Discoverer.

7.1. For each event, record the date and time that the supply barge attaches to the Discoverer.

7.2. For each event, record the date and time that the supply barge detaches from the Discoverer.

M. SHALLOW GAS DIVERTER SYSTEM (FD-33)

1. **Shallow Gas Diverter System.** There shall be no emissions of any regulated NSR pollutants or GHGs from the shallow gas diverter system.

2. **Shallow Gas Diversions.** The permittee shall:

2.1. Record the frequency and duration of each shallow gas diversion.

2.2. Report the frequency and duration of each shallow gas diversion no later than March 1st for the time period beginning January 1st and ending December 31st of the preceding year.

N. CUTTINGS/MUD DISPOSAL BARGE (FD-34)

1. **Operational Limits.** The permittee shall not operate any fuel combustion sources on the cuttings/mud disposal barge when it is attached to the Discoverer. At no time shall the cuttings/mud disposal barge tug be attached to the Discoverer.

1.1. No later than 45 days prior to deployment to the Beaufort Sea each drilling season, the permittee shall provide notification to the EPA of the selected cuttings/mud disposal barge. The notification shall include a list of all emission sources on board the barge.

1.2. For each event, record the date and time that the cuttings/mud disposal barge attaches to the Discoverer.

1.3. For each event, record the date and time that the cuttings/mud disposal barge detaches from the Discoverer.

O. ICEBREAKER #1

1. **Operation of SCR Unit.** At all times that any of the propulsion or generator engines on board Icebreaker #1 are in operation, the exhaust from each engine shall be directed to an operating SCR emission unit.

2. **Operation of Oxidation Catalyst.** At all times that any of the propulsion or generator engines on board Icebreaker #1 are in operation, the exhaust from each engine shall be directed to an operating oxidation catalyst emission unit.

3. **Aggregate Capacity Limits.** For a given drilling season, the permittee may select any vessel as Icebreaker #1, subject to the following conditions:

   3.1. The total capacity of all propulsion engines on Icebreaker #1 shall not exceed 28,400 hp.

   3.2. The total capacity of all generator engines on Icebreaker #1 shall not exceed 2,800 hp.

   3.3. The total capacity of all boilers on Icebreaker #1 shall not exceed 10 MMBtu/hr.

   3.4. The total capacity of all incinerators on Icebreaker #1 shall not exceed 154 lbs/hr.

   3.5. Total uncontrolled emissions of $PM_{2.5}$ from all emission sources on board Icebreaker #1 shall not exceed 42.20 lbs/hour.

      3.5.1. For compliance with Condition O.3.5 measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

      3.5.2. For the purposes of Condition O.3.5, 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.

   3.6. Total uncontrolled emissions of PM_{10} from all emission sources on board Icebreaker #1 shall not exceed 48.0 lbs/hour.

      3.6.1. For compliance with Condition O.3.6, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

      3.6.2. For the purposes of Condition O.3.6, 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.

   3.7. No later than 45 days prior to deployment to the Beaufort Sea each drilling season, the permittee shall provide notification to the EPA of the vessel selected as Icebreaker #1. The notification shall include a list of all emission sources on board the vessel as well as manufacturer, model, and rated capacity of each such emission source, and the conversion efficiency (mechanical to electrical) of each generator on board.

4. **Capacity Limit on Icebreaker #1 Propulsion Engines.** At all times while the Discoverer is an OCS Source and Icebreaker #1 is within 25 miles of the Discoverer, the permittee shall limit operation of the propulsion engines in Icebreaker #1 to no greater than 80 percent of rated capacity.

5. **Annual Emission Limits.** At all times while the Discoverer is an OCS Source and Icebreaker #1 is within 25 miles of the Discoverer, emissions from all emission sources on Icebreaker #1 in aggregate shall not exceed the emission limits specified for each of the pollutants below:

5.1. **NO_X:** 41.59 tons/rolling 12-month period

5.1.1. For compliance with Condition O.5.1, measurement of NO_X shall be determined using EPA Method 7E.

6. **Hourly Emission Limits.** Emissions from all emission sources on Icebreaker #1 in aggregate shall not exceed the emission limits specified for each of the pollutants below:

6.1. **NO_X:** 67.96 lbs/hour

6.1.1. For compliance with Condition O.6.1, measurement of NO_X shall be determined using EPA Method 7E.

7. **Daily Emission Limits.** At all times while the Discoverer is an OCS Source and Icebreaker #1 is within 25 miles of the Discoverer, emissions from all emission sources on Icebreaker #1 in aggregate shall not exceed the emission limits specified for each of the pollutants below:

7.1. **PM_{10}:** 277.47 lbs/day

7.1.1. For compliance with Condition O.7.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

7.2. **$PM_{2.5}$:** 269.66 lbs/day

7.2.1. For compliance with Condition O.7.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

8. **Electrical Power Output Limit.** At all times while the Discoverer is an OCS Source and Icebreaker #1 is within 25 miles of the Discoverer, the permittee shall not operate the internal combustion engines in excess of:

8.1. 28,233,704 kWe-hr from all of the generators on board Icebreaker #1 in aggregate during any rolling 12-month period; or

8.2. 420,188 kWe-hr from all of the generators on board Icebreaker #1 in aggregate during any calendar day.

9. **Fuel Usage Limit.** At all times while the Discoverer is an OCS Source and Icebreaker #1 is within 25 miles of the Discoverer, the permittee shall not use fuel in excess of:

9.1. 302,400 gallons in all heat boilers on board Icebreaker #1 in aggregate during any rolling 12-month period; or

9.2. 1,800 gallons in all heat boilers on board Icebreaker #1 in aggregate during any calendar day; or

9.3. 100 gallons in Icebreaker #1 seldom used sources in aggregate during any rolling 7-day period. Icebreaker #1 seldom used sources include engines on Icebreaker #1, that are not otherwise identified in the permit as emission units or categories of emission units on Icebreaker #1.

10. **Attachment to Discoverer.** At no time shall Icebreaker #1 be attached to the Discoverer.

11. **Stack Height Limit for Icebreaker #1.** The permittee shall ensure that the stack height of Icebreaker #1 is no less than 24.38 meters. For the purposes of this condition, the permittee shall obtain the stack height information for each vessel to be used as Icebreaker #1.

12. **Stack Test Requirements.** Prior to each of the first two drilling seasons that a vessel is used as Icebreaker #1, 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 #1 as follows:

    12.1. Each stack test on the propulsion engines shall be conducted at three different loads: 30 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_X, NO_2, $PM_{2.5}$, and PM_{10}.

    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);

        12.6.4. For the engines, electrical power output (in kWe);

        12.6.5. The stack temperature upstream of the SCR catalysis ºC or ºF;

        12.6.6. The quantity of urea reagent (in gallons) and the concentration of the urea reagent (in weight percent) introduced into the SCR control system; and

        12.6.7. The NO_X concentration (ppm) indicated by the periodic NO_X monitor used for the SCR control system.

    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 #1 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; and

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 #1 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) or boiler group 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 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 the 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 the hourly fuel usage for each boiler.

13.8. For each instance in which an Icebreaker #1 seldom used source is operated while the Discoverer is an OCS Source, the permittee shall:

13.8.1. Record the duration of the episode for each suchseldom used source;

13.8.2. Record the fuel consumption on a daily basis for each such seldom used source as provided in Condition B.6.4.2; and

13.8.3. Calculate and record for the previous 6 calendar days the rolling 7-day fuel consumption of Icebreaker #1 seldom used sources in aggregate by adding each day's fuel consumption to the total fuel consumed in the previous 6-calendar days.

13.9. At least 45 days before deployment to the Discoverer each drilling season, the permittee shall notify the EPA of the stack height of Icebreaker #1.

13.10. Record any instance that Icebreaker #1 attaches to the Discoverer.

13.11. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and emissions of $PM_{2.5}$ and PM_{10} 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.

13.12. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and emissions of $PM_{2.5}$ and PM_{10} in pounds per day from each engine by using the emission factors for each tested engine collected under Condition 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.

13.13. For the purposes of Conditions O.13.11 and O.13.3, 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.

13.14. For the purposes of Conditions O.13.11 and O.13.3, 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.13.13.

13.15. For the purpose of Condition O.13.12, if either the urea pump is not operating or if the catalyst inlet temperature, measured in Condition B.28 , is less than 250^{o}C, calculate emissions of NO_X for the affected time period by using an uncontrolled emission factor obtained by applying a 95 percent NO_X-reduction efficiency to the emission factor determined pursuant to Condition O.12.8.

P. ICEBREAKER #2

1. **Operation of SCR Unit.** At all times that any of the propulsion or generator engines on board Icebreaker #2 are in operation, the exhaust from each engine shall be directed to an operating SCR emission unit.

2. **Operation of Oxidation Catalyst.** At all times that any of the propulsion or generator engines on board Icebreaker #2 are in operation, the exhaust from each engine shall be directed to an operating oxidation catalyst emission unit.

3. **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 P 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.

3.1. 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.

3.2. 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.3.1.

3.3. 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.

3.4. The total capacity of all incinerators on Icebreaker #2 shall not exceed 151.23 lbs/hr.

3.5. Total uncontrolled emissions of $PM_{2.5}$ from all emission sources on board Icebreaker #2 shall not exceed 11.4 lbs/hour.

3.5.1. For compliance with Condition P.3.5, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

3.5.2. For the purposes of Condition P.3.5, 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.

3.6. Total uncontrolled emissions of PM_{10} from all emission sources on board Icebreaker #2 shall not exceed 11.7 lbs/hour.

3.6.1. For compliance with Condition P.3.6, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

3.6.2. For the purposes of Condition P.3.6, 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.

3.7. No later than 45 days prior to deployment to the Beaufort Sea each drilling season, the permittee shall provide notification to the 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.

4. **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.

5. **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:

   5.1. **NO_X:** 99.45 tons/rolling 12-month period

      5.1.1. For compliance with Condition P.5.1, measurement of NO_X shall be determined using EPA Method 7E.

6. **Hourly Emission Limits.** Emissions from all emission sources on Icebreaker #2 in aggregate shall not exceed the emission limits specified for each of the pollutants below:

   6.1. **NO_X:** 69.06 lbs/hour

      6.1.1. For compliance with Condition P.6.1, measurement of NO_X shall be determined using EPA Method 7E.

7. **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:

   7.1. **PM_{10}:** 281.46 lbs/day

      7.1.1. For compliance with Condition P.7.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

   7.2. **$PM_{2.5}$:** 273.82 lbs/day

      7.2.1. For compliance with Condition P.7.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

8. **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:

   8.1. 25,223,168 kWe-hr from all of the generators on board the Tor Viking in aggregate during any rolling 12-month period.

   8.2. 44,562.643 kWe-hr from all of the generators on board Hull 247 in aggregate during any rolling 12-month period.

   8.3. 395,100 kWe-hr from all of the generators on board the Tor Viking in aggregate during any calendar day.

   8.4. 592,141 kWe-hr from all of the generators on board Hull 247 in aggregate during any calendar day.

9. **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:

   9.1. 40,320 gallons in all heat boilers on board the Tor Viking in aggregate during any rolling 12-month period.

9.2. 120,960 gallons in all heat boilers on board Hull 247 in aggregate during any rolling 12-month period.

9.3. 240 gallons in all heat boilers on board the Tor Viking in aggregate during any calendar day.

9.4. 720 gallons in all heat boilers on board Hull 247 in aggregate during any calendar day.

9.5. 100 gallons in Icebreaker #2 seldom used sources in aggregate during any rolling 7-day period. Icebreaker #2 seldom used sources include engines on Icebreaker # 2, that are not otherwise identified in the permit as emission units or categories of emission units on Icebreaker #2.

10. **Attachment to Discoverer**. At no time shall Icebreaker #2 be attached to the Discoverer.

11. **Stack Height Limit for Icebreaker #2**. The permittee shall ensure that the stack height of Icebreaker #2 is no less than 24.38 meters. For the purposes of this condition, the permittee shall obtain the stack height information for each vessel to be used as Icebreaker #2.

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_X, NO_2, $PM_{2.5}$, and PM_{10}.

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);

12.6.4. For the engines, electrical power output (in kWe);

12.6.5. The stack temperature upstream of the SCR catalyst ºC or ºF;

12.6.6. The quantity of urea reagent (in gallons) and the concentration of the urea reagent (in weight percent) introduced into the SCR control system; and

12.6.7. The NO_X concentration (ppm) indicated by the periodic NO_X monitor used for the SCR control system.

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) or boiler group 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 the 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 the hourly fuel usage for each boiler.

13.8. For each instance in which an Icebreaker #2 seldom used source is operated while the Discoverer is an OCS Source, the permittee shall:

13.8.1. Record the duration of the episode for each such seldom used source;

13.8.2. Record the fuel consumption on a daily basis for each Icebreaker #2 seldom used source as provided in Condition B.6.4.2; and

13.8.3. Calculate and record for the previous 6 calendar days the rolling 7-day fuel consumption of such seldom used sources in aggregate by adding each day's fuel consumption to the total fuel consumed in the previous 6-calendar days.

13.9. At least 45 days before deployment to the Discoverer each drilling season, the permittee shall notify the EPA of the stack height of Icebreaker #2.

13.10. Record any instance that Icebreaker #2 attaches to the Discoverer.

13.11. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and emissions of $PM_{2.5}$ and PM_{10} 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.

13.12. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and emissions of $PM_{2.5}$ and PM_{10} 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.

13.13. For the purposes of Conditions P.13.11 and P.13.12, 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.

13.14. For the purposes of Conditions P.13.11 and P.13.12, 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.13.13.

13.15. For the purpose of Condition P.13.12, if either the urea pump is not operating or if the catalyst inlet temperature, measured in Condition B.28, is less than 250^{o}C, calculate emissions of NO_X for the affected time period by using an uncontrolled emission factor obtained by applying a 95 percent NO_X-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 on the supply ship.

   1.2. Not use fuel in excess of 1,200 gallons in the supply ship propulsion engines and non-propulsion engines in aggregate during any calendar day when in transit to and from the Discoverer.

   1.3. Not use fuel in excess of 4,800 gallons in the supply ship propulsion engines and non-propulsion engines in aggregate during any calendar day when operating in dynamic positioning mode.

2. **Hourly Emission Limits on Supply Ship in Dynamic Positioning Mode.** Emissions from all generator and propulsion engines in aggregate on the supply ship shall not exceed the emission limits specified for each of the pollutants below:

   2.1. **Nitrogen oxides (NO_X):** 117.39 lb/hr

      2.1.1. For compliance with Condition Q.2.1, measurement of NO_X shall be determined using EPA Method 7E.

3. **Daily Emission Limits on Supply Ship in Dynamic Positioning Mode.** Emissions from all generator and propulsion engines in aggregate on the supply ship shall not exceed the emission limits specified for each of the pollutants below:

   3.1. **PM_{10}:** 75.09 lbs/day

      3.1.1. For compliance with Condition Q.3.1, measurement of PM_{10} shall be determined using EPA Method s 201A and 202.

   3.2. **$PM_{2.5}$:** 75.09 lbs/day

      3.2.1. For compliance with Condition Q.3.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

4. **Stack Test Requirements.** Prior to each of the first two drilling seasons that the supply ship is used and while the Discoverer is operating under this permit in the Beaufort Sea, the permittee shall stack test each propulsion engine and non-propulsion generator engine on the supply ship as follows:

   4.1. Each stack test on the propulsion engines shall be conducted at four different loads: 20 percent, 40 percent, 60 percent, and 80 percent.

   4.2. Each stack test on the non-propulsion generator engines shall be conducted at two different load ranges: 50 - 60 percent and 90 - 100 percent.

   4.3. Each stack test run shall test for emissions of NO_X, NO_2, $PM_{2.5}$, and PM_{10}.

   4.4. During each test run for the propulsion engines and generator engines, the permittee shall monitor and record the following information:

      4.4.1. Quantity of fuel used (in gallons);

4.4.2. Density of the fuel used (in lbs/gallon);

4.4.3. Heat content of the fuel used (in Btu/gallon); and

4.4.4. For the engines, electrical power output (in kWe);

4.5. 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.

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

5.1. At all times while the Discoverer is an OCS Source and the supply ship is within 25 miles of the Discoverer, monitor the power output of each propulsion engine on the supply ship at least once every 15 minutes.

5.1.1. The monitored power output shall be recorded as a direct readout value as well as a percentage of the rated capacity of each engine.

5.2. Equip each of the propulsion and non-propulsion engines on the Supply Ship with a diesel fuel flow meter or install a single fuel meter for all of the engines:

5.2.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

5.2.2. Each fuel flow meter shall be totalizing and non-resettable; and

5.2.3. 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.

5.3. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

5.4. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

5.5. Monitor and record the hourly fuel usage for the supply ship.

5.6. For each trip to the Discoverer while the Discoverer is an OCS Source, the permittee shall record the following:

5.6.1. The date and time that the supply ship came within 25 miles of the Discoverer; and

5.6.2. After the delivery to the Discoverer, the date and time that the supply ship was no longer within 25 miles of the Discoverer.

5.7. Each day, calculate and record for the previous calendar day, the emissions of NO_X in pounds per hour and pounds per day and the emissions of $PM_{2.5}$ and PM_{10} in pounds per day from each engine by using the emission factors for each tested engine collected under Condition Q.4.5 and recorded fuel use under Condition Q.5.5.

5.8. Record the date and time the supply ship begins operation in dynamic positioning mode.

5.9. Record the date and time the supply ship ceases operation in dynamic positioning mode.

6. **Supply Ship Events.** The total number of events during which the supply ship transits to and from the Discoverer and either attaches to the Discoverer or operates in dynamic positioning mode shall not exceed 8 in any drilling season. Each 24-hour period of operation in dynamic positioning mode is considered a separate supply ship event.

7. **Supply Barge and Tug Alternative.** If a supply barge/tug is used in lieu of the supply ship, the barge and tug shall:

7.1. No later than 45 days prior to deployment to the Beaufort Sea each drilling season, the permittee shall provide notification to the EPA of the selected supply barge and tug. 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.

7.2. Operational Limits on Supply Barge and Tug Engines. At all times while the Discoverer is an OCS Source and the supply barge and tug is within 25 miles of the Discoverer, the permittee shall:

7.2.1. Limit operation of all engines to an aggregate of 5760 hp.

7.2.2. Each transit of a tug to and from the Discoverer shall equal one supply ship event for purpose of Condition Q.6

7.3. In addition the supply barge and tug will comply with Conditions Q.4 above.

R. OIL SPILL RESPONSE FLEET

1. **Operation of Catalyzed Diesel Particulate Filter (CDPF).** At all times while the Discoverer is an OCS Source and the Nanuq is within 25 miles of the Discoverer, and any of the Nanuq propulsion engines (Units N-1 – 2) or non-propulsion generator engines (Units N-3 – 4) are in operation, the exhaust from each emission unit shall be directed to operating CleanAIR Systems CDPF, as specified by CleanAIR Systems.

1.1. Each CDPF shall be equipped with an operating HiBACK monitor and alarm unit, that records exhaust pressure and temperature.

1.2. During each day that each of Units N-1 – 4 is operated, the exhaust temperature shall be above 300^{o}C, or 572^{o}F, for at least 30 percent of the time.

2. **Annual Emission Limits.** At all times while the Discoverer is an OCS source and the Oil Spill Response fleet is within 25 miles of the Discoverer, emissions of NO_X from the Oil Spill Response Fleet shall not exceed the emission limits specified below:

2.1. **Nanuq propulsion engines and generators in aggregate (Units N-1 – 4):** 97.11 tons/rolling 12-month period

2.2. **Point Class Tug and Arctic Endeavor Barge period propulsion engines and generators in aggregate (Units PBT-1-4, AEB-1-4):** 71.55 tons/rolling 12-month period

2.3. **Kvichak Nos. 1-3 and Rozema Skimmer propulsion engines in aggregate (Units K1-2, K4-5, K7-8, R1-2):** 19.07 tons/rolling 12-month period

2.3.1. For compliance with Conditions R.2.1, R.2.2, and 2.3, measurement of NO_X shall be determined using EPA Method 7E.

3. **Hourly Emission Limits.** At all times while the Discoverer is an OCS source and the Oil Spill Response fleet is within 25 miles of the Discoverer, emissions of NO_X from the Oil Spill Response Fleet shall not exceed the emission limits specified below:

3.1. Nanuq propulsion engines and generators in aggregate (Units N-1 – 4)

3.1.1. **NO_X** 67.44 lb/hr

3.1.1.1. For compliance with Condition R.3.1.1, measurement of NO_X shall be determined using EPA Method 7E.

3.2. Point Class Tug and Arctic Endeavor Barge propulsion engines and generators in aggregate (Units PBT-1-4, AEB-1-4):

3.2.1. **NO_X** 49.69lb/hr

3.2.1.1. For compliance with Condition R.3.2.1, measurement of NO_X shall be determined using EPA Method 7E.

3.3. Kvichak Nos. 1-3 and Rozema Skimmer propulsion engines in aggregate (Units K1-2, K4-5, K7-8, R1-2):

3.3.1. **NO_X** 13.24lb/hr

3.3.1.1. For compliance with Condition R.3.3.1 measurement of NO_X shall be determined using EPA Method 7E.

4. **Daily Emission Limits.** At all times while the Discoverer is an OCS source and the Oil Spill Response fleet is within 25 miles of the Discoverer, emissions from the Oil Spill Response Fleet shall not exceed the emission limits specified:

4.1. Nanuq propulsion engines and generators in aggregate (Units N-1 – 4):

4.1.1. **PM_{10}:** 3.03 lbs/day

4.1.1.1. For compliance with Condition R.4.1.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

4.1.2. **$PM_{2.5}$:** 3.03 lbs/day

4.1.2.1. For compliance with Condition R.4.1.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

4.2. Point Class Tug and Arctic Endeavor Barge in aggregate (Units PBT-1-4, AEB-1-4):

4.2.1. **PM_{10}:** 21.35 lbs/day

4.2.1.1. For compliance with Condition R.4.2.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

4.2.2. **$PM_{2.5}$:** 21.35 lbs/day

4.2.2.1. For compliance with Condition R.4.2.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

4.3. Kvichak Nos. 1-3 and Rozema Skimmer in aggregate (Units K1-2, K4-5, K7-8, R1-2):

4.3.1. **PM_{10}:** 24.34 lbs/day

4.3.1.1. For compliance with Condition R.4.3.1, measurement of PM_{10} shall be determined using EPA Methods 201A and 202.

4.3.2. **$PM_{2.5}$:** 24.34 lbs/day

4.3.2.1. For compliance with Condition R.4.3.2, measurement of $PM_{2.5}$ shall be determined using EPA Methods 201A and 202.

5. **Fuel Usage Limit.** At all times while the Discoverer is an OCS Source and the OSR Fleet is within 25 miles of the Discoverer, the permittee shall not use in excess of:

5.1. 456,000 gallons of fuel in the Nanuq propulsion engines (Units N-1 – 2) and non-propulsion electrical generators (Units N-3 – 4) in aggregate during any rolling 12-month period.

5.2. 3,800 gallons of fuel in the Nanuq propulsion engines (Units N-1 – 2) and non-propulsion electrical generators (Units N-3 – 4) in aggregate during any calendar day.

5.3. 336,000 gallons of fuel in the Point Class Tug propulsion engines (Units PBT-1 – 2) and non-propulsion generator engines (Units PBT-3 – 4) and the Arctic Endeavor Barge non-propulsion generation engines (Units AEB-1 – 4) in aggregate during any rolling 12-month period.

5.4. 2,800 gallons of fuel in the Point Class Tug propulsion engines (Units PBT-1 – 2) and non-propulsion generator engines (Units PBT-3 – 4) and the Arctic Endeavor Barge non-propulsion generation engines (Units AEB-1 – 4) in aggregate during any calendar day.

5.5. 100 gallons of fuel in the Nanuq seldom used sources in aggregate during any rolling 7-day period and 100 gallons of fuel in the Point Class Tug seldom used sources in aggregate during any rolling 7-day period. The Nanuq and Point Class Tug seldom used sources include engines on the Nanuq and Point Class Tug that are not otherwise identified in the permit as emission units or categories of emission units on the Nanuq and Point Class Tug.

5.6. 2856 gallons of fuel in the Kvichak Nos. 1-3 and the Rozema Skimmer in aggregate during any rolling 7-day period.

6. **Operating Location.** Except for transport of crew and supplies to and from the Discoverer or when responding to an oil spill, the oil spill response fleet shall operate at a location that is downwind from the Discoverer.

7. **Attachment to Discoverer.** At no time shall the Arctic Endeavor Barge, Point Class Tug, Nanuq, Rozema Skimmer or any of the Kvichak work boats be attached to the Discoverer.

8. **Stack Test Requirements.** Prior to each of the first two drilling seasons while the Discoverer is operating under this permit in the Beaufort Sea, the permittee shall stack test at least one of the Nanuq propulsion engines (Units N-1 – 2) one of the Nanuq non-propulsion generator engines (Units N-3 – 4), one of the Point Class Tug propulsion engines (Units PBT-1 – 2), one of the Point Class Tug non-propulsion engines (Units PBT-1 – 2) and all of the Endeavor Barge engines (Units AEB-1 – 4) as follows:

   8.1. At the end of two drilling seasons that the Discoverer operates under this permit in the Beaufort Sea, all of Units N-1 – 4 shall have been stack tested under the requirements of this section.

   8.2. Each stack test shall be conducted at four different loads - 25 percent, 50 percent, 75 percent and 100 percent for the propulsion engines and at two loads - 50 percent and 100 percent for the non-propulsion engines.

   8.3. Each stack test run shall test for emissions of NO_X and NO_2.

   8.4. During each test run, the permittee shall monitor and record the following information:

      8.4.1. Quantity of fuel used (in gallons);

      8.4.2. Density of the fuel used (in lbs/gallon);

      8.4.3. Heat content of the fuel used (in Btu/gallon); and

      8.4.4. Electrical power output (in kWe).

   8.5. For each engine, each load, and each pollutant, the permittee shall determine emission factors in the following units: lbs/kWe-hr and lbs/gallon.

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

   9.1. Equip each of Units FD-N-1 - 4 with a diesel fuel flow meter or install a single fuel meter for all of Units FD-N-1 - 4:

      9.1.1. Each fuel flow meter shall be located so that there is no potential for fuel inflows or outflows between it and the engine(s) or engine group being served by the meter;

      9.1.2. Each fuel flow meter shall be totalizing and nonresettable; and

      9.1.3. 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.

   9.2. 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 the EPA no less than 30 days prior to operation within the Beaufort Sea.

9.3. Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

9.4. Monitor and record fuel usage for each propulsion and generator engine (Units N-1 – 4) on a hourly basis.

9.5. For each instance in which a Nanuq seldom used source is operated while the Discoverer is an OCS Source, the permittee shall:

9.5.1. Record the duration of the episode for each such seldom used source;

9.5.2. Record the fuel consumption on a daily basis for each such seldom used source as provided in Condition B.6.4.2; and

9.5.3. Calculate and record for the previous 6 calendar days the rolling 7-day fuel consumption of the Nanuq seldom used sources in aggregate by adding each day's fuel consumption to the total fuel consumed in the previous 6-calendar days.

9.6. For each instance in which a Point Class Tug seldom used source is operated while the Discoverer is an OCS Source, the permittee shall:

9.6.1. Record the duration of the episode for each such seldom used source;

9.6.2. Record the fuel consumption on a daily basis for each such seldom used source as provided in Condition B.6.4.2; and

9.6.3. Calculate and record for the previous 6 calendar days the rolling 7-day fuel consumption of the Point Class Tug seldom used sources in aggregate by adding each day's fuel consumption to the total fuel consumed in the previous 6-calendar days.

9.7. Record any instance that the Arctic Endeavor Barge, Point Class Tug, Nanuq, Rozema Skimmer or Kvichak work boats attach to the Discoverer.

9.8. Each day, calculate and record for the previous calendar day, the emissions of NO_X, in pounds per hour and pounds per day using the highest emission factor for each tested engine collected under Condition R.8.5 and fuel usage data collected under Condition R.9.4.

9.9. Monitor and record the exhaust temperature of each engine by use of the HiBACK monitor and alarm unit, while the engine is in operation.

9.10. Each day, calculate and record for the previous calendar day, the percent of operational time for each engine that the exhaust temperature was above 300^{o}C (572^{o}F).

S. POST-CONSTRUCTION AMBIENT AIR QUALITY MONITORING

1. **Ambient Air Quality Monitoring Station.** The permittee shall install, operate and maintain a Federal Reference Method or Federal Equivalent Method ambient air quality monitoring station to measure and record $PM_{2.5}$ concentration data in accordance with the EPA, 1984a: Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), EPA-450/4-87-007, May 1987, U.S. Environmental Protection Agency, Research Triangle Park, NC.

   1.1. An alternative $PM_{2.5}$ monitoring station may be used in lieu of the required monitoring station provided that approval of the monitoring station is obtained from the EPA;

   1.2. The permittee shall use a continuous sampler and a manual sampler to measure $PM_{2.5}$. In addition, filters from the manual sampler shall be analyzed as provided for in the EPA-approved ambient air quality and meteorological monitoring plan required pursuant to Condition S.3 to allow for the chemical speciation of $PM_{2.5}$ constituents, including but not limited to sulfates, nitrates, organics, metals, sea salt, and crustal matter;

   1.3. The monitoring period shall commence within 120 days after the final permit is issued and shall continue for a minimum of 1 year after commencement of initial operation of the Discoverer in the Beaufort Sea as an OCS Source;

   1.4. The data recovery shall be as provided for in the EPA-approved ambient air quality and meteorological monitoring plan required pursuant to Condition S.3; and

   1.5. The monitoring station shall continue to operate and record data until such time that written approval is obtained from the EPA authorizing the termination of its operation.

2. **Meteorological Monitoring Station.** The permittee shall install, operate and maintain a meteorological monitoring station to monitor and record data in accordance with the EPA, 1984a: Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), EPA-450/4-87-007, May 1987, U.S. Environmental Protection Agency, Research Triangle Park, NC.

   2.1. An alternative meteorological monitoring station may be used in lieu of the required monitoring station provided that approval of the monitoring station is obtained from the EPA;

   2.2. Data shall include horizontal wind direction and speed, temperature, solar radiation, and temperature difference;

   2.3. Each quarter's data recovery shall be as provided for in the EPA-approved ambient air quality and meteorological monitoring plan required pursuant to Condition S.3;

   2.4. The monitoring period shall commence within 120 days after the final permit is issued and shall continue for a minimum of 1 year after commencement of operation of the OCS Source; and

2.5. The monitoring station shall continue to operate and record data until such time that written approval is obtained from the EPA authorizing the termination of its operation.

3. **Ambient Air Quality and Meteorological Monitoring Plan.** At least 60 days prior to the commencement of the data collection, the permittee shall submit to the EPA for approval an ambient air quality and meteorological monitoring plan for the post-construction monitoring requirements specified in Conditions S.1 and S.2 in accordance with the requirements of 40 CFR Part 58, Appendix A "Quality Assurance Requirements for SLAMS, SPMs and PSD Air Monitoring." The plan shall include a description of the proposed monitoring site.

4. **Monthly Reporting.** Within 45 days after the end of each calendar month, the permittee shall submit to the EPA a printed summary of the $PM_{2.5}$ and meteorological monitoring data collected during the prior calendar month.

5. **Audit Reports.** The permittee shall submit audit reports with 45 days after the following events:

   5.1. Completion of the post-installation equipment audit;

   5.2. Completion of independent performance and system audits;

   5.3. Completion of quarterly audits required for ambient air quality data collection system; and

   5.4. Completion of the semi-annual audits required for the meteorological data collection system.

   Quarterly and semi-annual audit periods shall be based on a calendar year.

6. **Annual Report.** Within 60 days after the end of each calendar year and following completion of the collection of monitoring, the permittee shall submit to the EPA annual/final reports in text, tabular, and graphic forms, including data in digitized format. The digitized formats of the measured air quality and meteorological data shall be in ASCII format and AIRS format.

7. **System and Performance Audit Report.** Within 60 days after completion of data collection, the permittee shall also submit the final report for the system and performance audits required prior to monitoring termination.

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ATTACHMENT A: EPA NOTIFICATION FORM

Excess Emissions and Permit Deviation Reporting

OCS Source (Facility) Name **Air Quality Permit Number**

Company Name

When did you discover the Excess Emissions/Permit Deviation?
Date: / / Time: :

When did the event/deviation?
Begin: Date: / / Time: : (please use 24hr clock)
End: Date: / / Time: : (please use 24hr clock)

What was the duration of the event/deviation: : (hrs:min) or days
(total # of hrs, min, or days, if intermittent then include only the duration of the actual emissions/deviation)

Reason for notification: (please check only 1 box and go to the corresponding section)
☐ Excess Emissions Complete Section 1 and Certify
☐ Deviation from Permit Conditions Complete Section 2 and Certify
☐ Deviation from COBC, CO, or Settlement Agreement Complete Section 2 and Certify

Section 1. Excess Emissions

(a) Was the exceedance ☐ Intermittent or ☐ Continuous

(b) Cause of Event (Check one that applies):
☐ Start Up/Shut Down ☐ Natural Cause (weather/earthquake/flood)
☐ Control Equipment Failure ☐ Scheduled Maintenance/Equipment Adjustments
☐ Bad fuel/coal/gas ☐ Upset Condition ☐ Other

(c) Description:
Describe briefly what happened and the cause. Include the parameters/operating conditions exceeded, limits, monitoring data and exceedance.

(d) Emission Units Involved:
Identify the emission units involved in the event, using the same identification number and name as in the permit. Identify each emission standard potentially exceeded during the event and the exceedance.

Unit ID	Emission Unit Name	Permit Condition Exceeded/Limit/ Potential Exceedance

(e) Type of Incident (please check only one):

☐ Opacity percent	☐ Venting (gas/scf)	☐ Control Equipment Down
☐ Fugitive Emissions	☐ Emission Limit Exceeded	☐ Record Keeping Failure
☐ Marine Vessel Opacity	☐ Flaring	☐ Other:

(f) Unavoidable Emissions:

Do you intend to assert that these excess emissions were unavoidable?	☐ YES	☐ NO
Do you intend to assert the affirmative defense of 18 AAC 50.235?	☐ YES	☐ NO

Certify Report (go to end of form)

Section 2. Permit Deviations

(a) Permit Deviation Type (check one only) (check boxes correspond with sections in permit):
☐ Source Specific
☐ Failure to monitor/report
☐ General Source Test/Monitoring Requirements
☐ Recordkeeping/Reporting/Compliance Certification
☐ Standard Conditions Not Included in Permit
☐ Generally Applicable Requirements
☐ Reporting/Monitoring for Diesel Engines
☐ Insignificant Source
☐ Facility Wide
☐ Other Section: (title of section and section # of your permit)

(b) Emission Units Involved:
Identify the emission units involved in the event, using the same identification number and name as in the permit. List the corresponding Permit condition and the deviation.

Unit ID	Emission Unit Name	Permit Condition /Potential Deviation

(c) Description of Potential Deviation:
Describe briefly what happened and the cause. Include the parameters/operating conditions and the potential deviation.

(d) Corrective Actions:
Describe actions taken to correct the deviation or potential deviation and to prevent future recurrence.

Certification:
Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.

Printed Name **Title** **Date**

Signature **Phone number**

NOTE: *This document must be certified in accordance with 18 AAC 50.345(j)*

To Submit this Report:

1. Fax this form to: Facsimile no. 206-553-0110

   Or

2. E-mail to: R10OCSAirPermits_Reports@epa.gov

   Or

3. Mail to: OCS/PSD Air Quality Permits
   U.S. EPA - Region 10, AWT-107
   1200 Sixth Avenue, Suite 900
   Seattle, WA 98101

ATTACHMENT B: VISIBLE EMISSIONS FIELD DATA SHEET

Permit No. R10OCS/PSD-AK-2010-01

Certified Observer: _____

Company & Stationary Source: _____

Location: _____

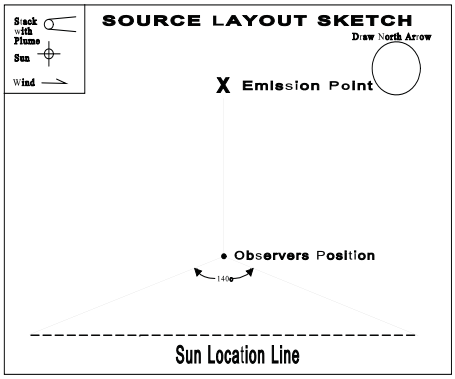
Test No.: _____ Date: _____

Emission Unit: _____

Operating Rate: _____

_____

_____



Clock Time	Initial				Final
Observer location Distance to discharge					
Direction from discharge					
Height of observer point					
Background description					
Weather conditions Wind Direction					
Wind speed					
Ambient temperature					
Relative humidity					
Sky conditions: (clear, overcast, % clouds, etc.)					
Plume description: Color					
Distance visible					
Water droplet plume? (Attached or detached?)					
Other information					

Page ___ of ___

Company & Stationary Source_____ Certified Observer_____

Test Number _____ Clock time_____

Date:		Visibility Reduction Every 15 Seconds (Opacity)				Steam Plume (check if applicable)		Comments
Hr	Min	0	15	30	45	Attached	Detached	

Additional information:

_____ _____
Observer Signature and Date Certified By and Date

Data Reduction:
Duration of Observation Period (minutes) _____ Duration Required by Permit (minutes)_____
Number of Observations _____ Highest Six –Minute Average Opacity (%)_____
Number of Observations exceeding 20 % _____

Average Opacity Summary

Set Number	Time Start—End	Opacity	
		Sum	Average