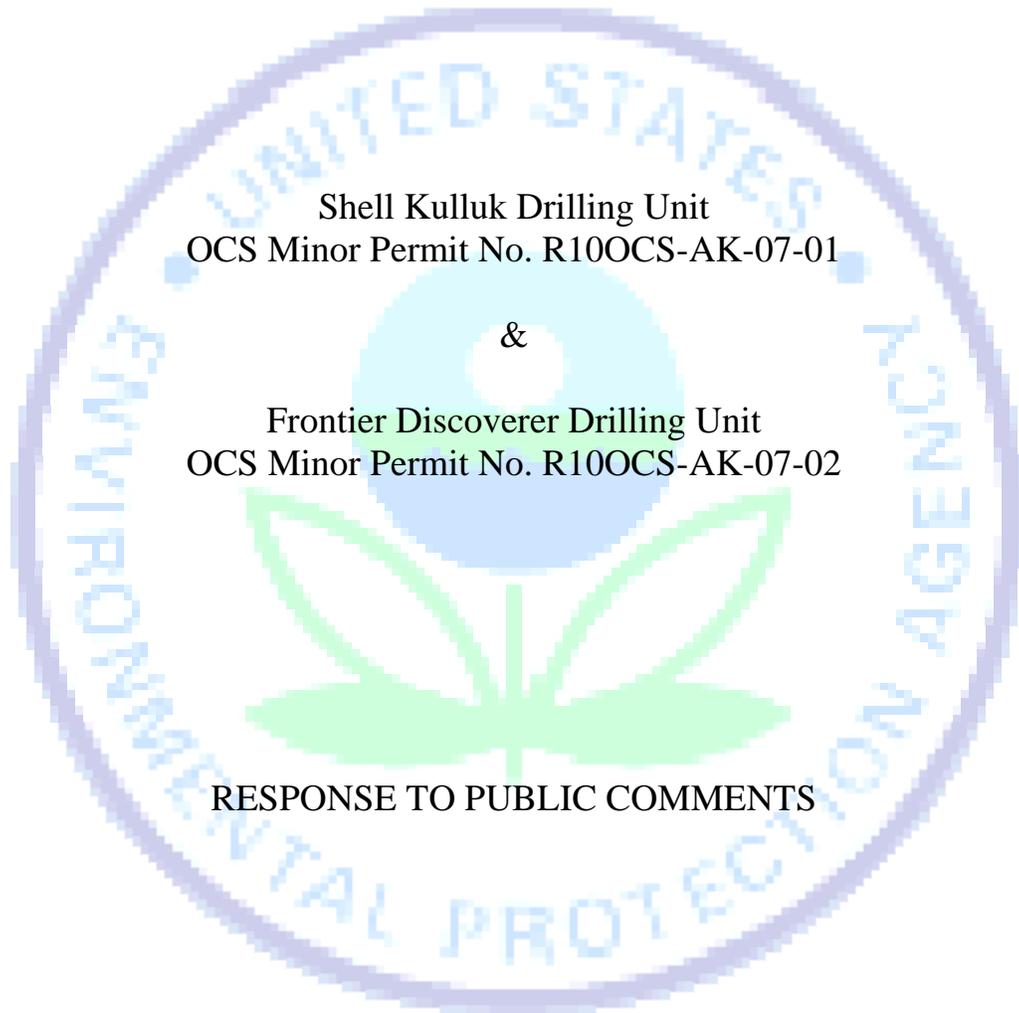


**Petitioner's Exhibit 12**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
Seattle, Washington



June 12, 2007

## TABLE OF CONTENTS

Category A:	General Comments in Support .....	7
Category B:	General Comments Requesting Permit Denial .....	17
Category C:	EPA Application Process .....	26
Comment C-1:	Minor Permit Application Process .....	26
Comment C-2:	Minor Permit Application Completeness Determination.....	27
Category D:	Modeling Analysis .....	31
Comment D-1:	Data Sets for Modeling Air Impacts .....	31
Comment D-2:	Ambient Air Quality Analysis.....	33
Category E:	Emission Inventory and Calculations .....	36
Comment E-1:	Total Emissions .....	36
Comment E-2:	Potential to Emit Calculations .....	38
Comment E-3:	Emission Inventory.....	40
Comment E-4:	Hazardous Air Pollutants .....	46
Category F:	Ambient Air Quality Standards.....	47
Comment F-1:	Applicable Offshore Standards .....	47
Comment F-2:	Protection of Ambient Air Quality Standards.....	47
Category G:	Outer Continental Shelf Definition.....	49
Comment G-1:	Outer Continental Shelf Source Definition .....	49
Category H:	Geographic Scope .....	53
Comment H-1:	Scope of the Project .....	53
Category I:	Permit Duration.....	54
Comment I-1:	Lack of Permit Duration.....	54
Category J:	Major Source General Comment .....	57
Comment J-1:	Project Should be Permitted as a Major Source.....	57
Category K:	Aggregation of Sources .....	63
Comment K-1:	Aggregation Memo.....	63
Comment K-2:	500 Meters vs. 25 Miles .....	67
Category L:	Permit Terms and Conditions .....	68
Comment L-1:	Specific Permit Terms .....	68
Comment L-2:	Monitoring and Enforcement .....	70
Comment L-3:	Persistent Organic Pollutants .....	73
Category M:	Endangered Species Act .....	74

Comment M-1: Compliance with the ESA.....	74
Comment M-2: Biological Opinion .....	74
Category N: Environmental Justice .....	76
Comment N-1: EPA’s Environmental Justice Obligation.....	76
Category O: Government-to-Government Consultation .....	78
Comment O-1: Consultation with Alaskan Native Communities .....	78
Category P: Public Comment.....	80
Comment P-1: Request for Extension of Public Comment Period .....	80
Category Q: Public Hearing.....	81
Comment Q-1: Lack of Information During Nuiqsut Public Hearing .....	81
Category R: Coordination Between Agencies.....	82
Comment R-1: EPA Jurisdiction .....	82
Comment R-2: EPA Coordination .....	82
Comment R-3: Minerals Management Service Air Quality Regulations .....	83
Category S: Class One Areas.....	84
Comment S-1: Impacts to the Arctic Wildlife Refuge, Teshekpuk Lake .....	84
Category T: Clean Water Act.....	85
Comment T-1: NPDES Permit .....	85
Category U: Oil Spill Response Plan .....	85
Comment U-1: Oil Spills.....	85
Category V: Global Warming .....	86
Comment V-1: Global Warming Impacts.....	86
Category W: National Environmental Policy Act .....	86
Comment W-1: Environmental Impact Statement.....	86
Category X: Subsistence and Traditional Use .....	88
Comment X-1: Subsistence and Traditional Use Impacts.....	88
Category Y: Local Air Quality Concerns .....	91
Comment Y-1: Air Quality in Nuiqsut .....	91
Category Z: Health Impacts.....	93
Comment Z-1: Health Impacts in Nuiqsut .....	93
Category AA: Request for Monitoring in Nuiqsut.....	95
Comment AA-1: Air Quality Monitoring in Nuiqsut .....	95
Conclusion .....	96

## ACRONYMS AND INITIALISMS

ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
ANWR	Arctic National Wildlife Refuge
ARBO	Arctic Regional Biological Opinion
ARCO	Arco Alaska, Inc.
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BE	Biological Evaluation
BLM	Bureau of Land Management
BO	Biological Opinions
BWASP	Bowhead Whale Aerial Survey Project
CAA	Clean Air Act
CBD	Center for Biological Diversity
CO	Carbon Monoxide
CWA	Clean Water Act
DITCA	Direct Implementation Tribal Cooperative Agreement
DOI	Department of Interior
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FO	Field Officer
FONSI	Finding of no Significant Impact
gr/dscf	Grains per Dry Standard Cubic Foot
HAP	Hazardous Air Pollutants

ICAS	Inupiat Community of the Arctic Slope
IHA	Incidental Hazard Assessment
ISC	Industrial Source Complex
ISC2	Industrial Source Complex Short-Tem
ITL	Instruction to Lessee
MACT	Maximum Achievable Control Technology
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MSA	Magnuson-Stevens Fisheries Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NAEC	Northern Alaska Environmental Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
NOAA	National Oceanic and Atmospheric Administration
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
NRC	National Research Council
NSB	North Slope Borough
NSR	New Source Review
OCD	Offshore Coastal and Dispersion
OCS	Outer Continental Shelf
OMB	Office of Management and Budget
ORL	Owner Requested Limit
OSR	Oil Spill Response
PM	Particulate Matter
PM <sub>2.5</sub>	Particulate Matter 2.5
PM <sub>10</sub>	Particulate Matter 10
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration

PTE	Potential to Emit
REDOIL	Resisting Environmental Destruction on Indigenous Lands
RS	Regional Supervisor
SIC	Standard Industrial Classification
SO <sub>2</sub>	Sulfur Dioxide
TPY	Tons Per Year
USCG	Unites States Coast Guard
USFWS	Unites States Fish and Wildlife Services
VOC	Volatile Organic Compound

**RESPONSE TO COMMENTS**

The Environmental Protection Agency (EPA) received numerous comments from the public on Shell Offshore Inc.’s (Shell) proposed permits. As described in more detail below, written comments were submitted from the applicant, the U. S. Mineral Management Services (MMS), the Alaska Department of Environmental Conservation (ADEC), the North Slope Borough (NSB), the Northern Alaska Environmental Center (NAEC), the Center for Biological Diversity (CBD), and Resisting Environmental Destruction on Indigenous Lands (REDOIL) and from three individuals. Additionally a number of oral comments were made during the public hearing held May 8, 2007 in Nuiqsut, Alaska. Many of the commenters expressed similar and related comments. After receiving the comments EPA carefully reviewed and considered each comment. The comments along with EPA’s response to the comments are described below.

**Category A: General Comments in Support**

**COMMENT**

The MMS supports and encourages the EPA to proceed with issuing the permits in a timely manner.

**EPA RESPONSE**

EPA has expedited decisionmaking consistent with Executive Order 13212 of May 18, 2001 and as amended May 15, 2003.

**COMMENT**

Shell requests that the permits be amended to reflect a revised emissions inventory for the support vessels serving the Kulluk and Frontier Discoverer.

Table 2 – Kulluk Support Vessels					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
Vladimir Ignatjuk (icebreaker)					
VI-1	B1	Main Propulsion Engine		5,800	hp
VI-2	B1	Main Propulsion Engine		5,800	hp
VI-2	B1	Main Propulsion Engine		5,800	hp
VI-4	B1	Main Propulsion Engine		5,800	hp

Table 2 – Kulluk Support Vessels					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
VI-5	B2	Generator Engine		1,431	hp
VI-6	B2	Generator Engine		1,431	hp
VI-7	B3	Heat Boiler		2.4	MMBtu/hr
VI-8	B3	Hot Water Heater		0.54	MMBtu/hr
VI-9	K	Incinerator		66	lb/hr
Tor Viking II (icebreaker)					
TV-1	C1	Main Prop. Engine / Generator	MaK 8M32	5,046	hp
TV-2	C1	Main Prop. Engine / Generator	MaK 8M32	5,046	hp
TV-3	C1	Main Prop. Engine / Generator	MaK 6M32	3,784	hp
TV-4	C1	Main Prop. Engine / Generator	MaK 6M32	3,784	hp
TV-5	C2	Harbor Generator	Caterpillar 3412	1,168	hp
TV-6	C2	Harbor Generator	Caterpillar 3412	1,168	hp
TV-7	C3	Heat Boiler		1.37	MMBtu/hr
Jim Kilabuk (resupply vessel)					
JK-1	D	Main Propulsion Engine	EMD / V20 645	3,600	hp
JK-2	D	Main Propulsion Engine	EMD / V20 645	3,600	hp
JK-3	D	Generator	Caterpillar / D3406	292	hp
JK-4	D	Generator	Caterpillar / D3406	292	hp
JK-5	D	HPP Engine	Caterpillar / D343	300	hp
JK-6	D	Bow Thruster Engine	Caterpillar / D343	300	hp
Nanuq (Main Oil Spill Response Vehicle)					
N-1	E	Propulsion Engine		2,710	hp
N-2	E	Propulsion Engine		2,710	hp

Table 2 – Kulluk Support Vessels					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
N-3	E	Electric generator engine		1,285	hp
N-4	E	Electric generator engine		1,285	hp
N-5	E	Emergency electric generator engine		1,285	hp
N-6	E	Boiler		75	MMBtu/hr
N-7	K	Incinerator	ASC / CP100	125	lb/hr
Kvichak No. 1 34-foot Oil Spill Response Work Boat					
OSRK1-1	E	Engine		300	hp
OSRK1-2	E	Engine		300	hp
OSRK1-3	E	Electrical generator engine		12	hp
Kvichak No. 2 34-foot Oil Spill Response Work Boat					
OSRK2-1	E	Engine		300	hp
OSRK2-2	E	Engine		300	hp
OSRK3-2	E	Electrical generator engine		12	hp
Affinity/Perseverance (Arctic tanker & oil spill response vessel)					
AP-1	E	Propulsion Engine	MAN B&W / 7S60MC	15,820	kW
AP-2	E	Electrical Generator Engine P	MAN B&W / 7L23	1120	kW
AP-3	E	Electrical Generator Engine C	MAN B&W / 7L23	1120	kW
AP-4	E	Electrical Generator Engine S	MAN B&W / 7L23	1120	kW
AP-5	E	Emergency Generator Engine	Cummins / NT855	295	kW
AP-6	E	Framo Power Pack	Cummins / KTA19	477	kW
AP-7	E	Framo Power Pack	Cummins / KTA19	477	kW
AP-8	E	Framo Power Pack	Cummins / KTA19	477	kW
AP-9	E	Auxiliary boiler	KangRim / MB07S01	85	MMBtu/hr
AP-10	K	Incinerator	TeamTec / OG 400	580	kW

Table 2 – Discoverer Support Vessels					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
Kapitan Dranitsyn (icebreaker)					
KD-1	B1	Main Propulsion Engine	Wärtsilä / 9ZL	4,140	hp
KD-2	B1	Main Propulsion Engine	Wärtsilä / 9ZL	4,140	hp
KD-3	B1	Main Propulsion Engine	Wärtsilä / 9ZL	4,140	hp
KD-4	B1	Main Propulsion Engine	Wärtsilä / 9ZL	4,140	hp
KD-5	B1	Main Propulsion Engine	Wärtsilä / 9ZL	4,140	hp
KD-6	B1	Main Propulsion Engine	Wärtsilä / 9ZL	4,140	hp
KD-7	B2	Auxiliary Engine		1,050	hp
KD-8	B2	Auxiliary Engine		1,050	hp
KD-9	B2	Auxiliary Engine		1,050	hp
KD-10	B2	Auxiliary Engine		1,050	hp
KD-11	B2	Auxiliary Engine		1,050	hp
KD-12	B3	Compressor Engine		1,380	hp
KD-13	B3	Compressor Engine		1,380	hp
KD-14	B3	Emergency Generator Engine		438	hp
KD-15	B4	Heat Boiler		18	MMBtu/hr
KD-16	B4	Heat Boiler		18	MMBtu/hr
KD-17	K	Incinerator		70	kg/hr
Fennica/Nordica (icebreaker)					
FN-1	C1	Main Propulsion Engine	Wärtsilä / 16V32	7,884	hp
FN-2	C1	Main Propulsion Engine	Wärtsilä / 16V32	7,884	hp
FN-3	C1	Main Propulsion Engine	Wärtsilä / 12V32	5,913	hp

Table 2 – Discoverer Support Vessels					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
FN-4	C1	Main Propulsion Engine	Wärtsilä / 12V32	5,913	hp
FN-5	C2	Auxiliary Engine		710	hp
FN-6	C2	Emergency Generator Engine		300	hp
FN-7	C3	Heat Boiler		4.44	MMBtu/hr
FN-8	C3	Heat Boiler		4.44	MMBtu/hr
FN-9	K	Incinerator		70	kg/hr
Jim Kilabuk (resupply vessel)					
JK-1	D	Main Propulsion Engine	EMD / V20 645	3,600	hp
JK-2	D	Main Propulsion Engine	EMD / V20 645	3,600	hp
JK-3	D	Electric Generator Engine	Caterpillar / D3406	292	hp
JK-4	D	Electric Generator Engine	Caterpillar / D3406	292	hp
JK-5	D	HPP Engine	Caterpillar / D343	300	hp
JK-6	D	Bow Thruster Engine	Caterpillar / D343	300	hp
Point Barrow Tug (Main Oil Spill Response Vehicle)					
PBT-1	E	Main Propulsion Engine	Caterpillar 3512	1,050	hp
PBT-2	E	Main Propulsion Engine	Caterpillar 3512	1,050	hp
PBT-3	E	Electrical Generator Engine	Caterpillar 3304	150	hp
PBT-4	E	Electrical Generator Engine	Caterpillar 3304	150	hp
Kvichak 47-foot Oil Spill Response Work Boat					
OSR47K-1	E	Propulsion Engine	Lugger	700	hp
OSR47K-2	E	Propulsion Engine	Lugger	700	hp
OSR47K-3	E	Electrical generator Engine		9	kW
Kvichak No. 3 34-foot Oil Spill Response Work Boat					
OSRK3-1	E	Propulsion Engine		300	hp
OSRK3-2	E	Propulsion Engine		300	hp

Table 2 – Discoverer Support Vessels					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
OSRK3-3	E	Electrical Generator Engine		12	hp
Kvichak No. 4 34-foot Oil Spill Response Work Boat					
OSRK4-1	E	Propulsion Engine		300	hp
OSRK4-2	E	Propulsion Engine		300	hp
OSRK4-3	E	Electrical Generator Engine		12	hp
Kvichak No. 5 34-foot Oil Spill Response Work Boat					
OSRK5-1	E	Propulsion Engine		300	hp
OSRK5-2	E	Propulsion Engine		300	hp
OSRK5-3	E	Electrical Generator Engine		12	hp
Kvichak No. 6 34-foot Oil Spill Response Work Boat					
OSRK6-1	E	Propulsion Engine		300	hp
OSRK6-2	E	Propulsion Engine		300	hp
OSRK6-3	E	Electrical Generator Engine		12	hp
Arctic Endeavor Barge (positioned by the Point Barrow Tug)					
AEB-1	E	Crane Engine		350	hp
AEB-2	E	Light Plant Engine		30	hp
AEB-3	E	Electrical Generator Engine		126	hp
AEB-4	E	Electrical Generator Engine		126	hp
AEB-5	E	HPP Engine		145	kW
AEB-6	E	HPP Engine		145	kW
AEB-7	E	HPP Engine		80	kW
AEB-7	E	HPP Engine		80	kW
AEB-8	E	Anchor Engine	John Deere	50	hp
Affinity/Perseverance (Arctic tanker & oil spill response vessel)					
AP-1	E	Propulsion Engine	MAN B&W / 7S60MC	15,820	kW
AP-2	E	Electrical Generator Engine P	MAN B&W / 7L23	1120	kW

Table 2 – Discoverer Support Vessels

Unit ID	Source Group	Unit Description	Make/Model	Rating	
AP-3	E	Electrical Generator Engine C	MAN B&W / 7L23	1120	kW
AP-4	E	Electrical Generator Engine S	MAN B&W / 7L23	1120	kW
AP-5	E	Emergency Generator Engine	Cummins / NT855	295	kW
AP-6	E	Framo Power Pack	Cummins / KTA19	477	kW
AP-7	E	Framo Power Pack	Cummins / KTA19	477	kW
AP-8	E	Framo Power Pack	Cummins / KTA19	477	kW
AP-9	E	Auxiliary boiler	KangRim / MB07S01	85	MMBtu/hr
AP-10	K	Incinerator	TeamTec / OG 400	580	kW

**EPA RESPONSE**

EPA requested Shell to submit an ambient impact analysis to determine whether total emissions (originally proposed units plus newly proposed units) would cause or contribute to a national ambient air quality standards (NAAQS) violation. Shell subsequently submitted a revised analysis, and EPA concludes, as explained in more detail in response to comment Category D, that the total emissions will not cause or contribute to a NAAQS violation. EPA accepts Shell’s request to authorize construction and operation of the listed emission units. Both permits are being revised accordingly. A copy of each permit showing changes from the proposed permit is found in the attachment to this response to comment document and a markup is included as an attachment to this response to comments document.

**COMMENT**

Shell requested that EPA remove the requirement for a stack test on the Tor Viking harbor generator (Kulluk Source Group C2) because it is anticipated to be small, with only 0.58 ton per year (tpy) anticipated NO<sub>x</sub> emissions. Proper operation of the selective catalytic reduction (NO<sub>x</sub> control) system will be shown by the C1 source group testing. If the testing requirement is not removed, change the C2 stack testing conditions to “generator” testing conditions 8.2.a.(ii) from “propulsion” conditions 8.2.a.(i).

**EPA RESPONSE**

Shell’s request is reasonable, and EPA accepts Shell’s request to utilize the Tor Viking II harbor generator NO<sub>x</sub> emission factors submitted in the original application. EPA will allow Shell to utilize the originally proposed NO<sub>x</sub> emissions factors of 0.071 lb NO<sub>x</sub> / gal

fuel (controlled) and 0.421 lb NO<sub>x</sub> / gal fuel (uncontrolled) to determine compliance with the NO<sub>x</sub> emissions cap. This information will be inserted into the Kulluk Source Group Emission Factors Table. EPA will not require Shell to conduct stack testing to determine new emission factors. The Kulluk permit is being revised accordingly.

#### **COMMENT**

Shell requests EPA to remove the requirement for a stack test on one of the three Frontier Discoverer propulsion engines (Source Group A2) as its NO<sub>x</sub> emissions are estimated to be less than 1.0 tpy. The propulsion engines are only used to maneuver the vessel 25 miles to and from its drill site. At 7 knots, its average speed, this equates to less than 4 hours of use each way, and less than 8 hours total per drill site. This is considerably less than the 44 hours of use estimated in the December 29, 2006 application (Appendix B, page B-5).

#### **EPA RESPONSE**

Shell's request is reasonable, and EPA accepts Shell's request to utilize the Frontier Discoverer propulsion engines NO<sub>x</sub> emission factor submitted in the original application. EPA will allow Shell to utilize the originally proposed NO<sub>x</sub> emissions factor of 0.455 lb NO<sub>x</sub> / gal fuel to determine compliance with the NO<sub>x</sub> emissions cap. This information will be inserted into the Frontier Discoverer Source Group Emission Factors Table. EPA will not require Shell to conduct stack testing to determine a new emission factor. The Frontier Discoverer permit is being revised accordingly.

#### **COMMENT**

Shell requests EPA to revise the NO<sub>x</sub> stack testing requirement for the Vladimir Ignatjuk main generator engines (Kulluk Source Group B2) such that testing is conducted as intended for generator engines, not propulsion engines.

#### **EPA RESPONSE**

Shell's request is reasonable, and EPA accepts Shell's request to amend the permit to require that NO<sub>x</sub> stack testing for the Vladimir Ignatjuk main generator engines be conducted at 50%, 75%, and 100% of full load. The Kulluk permit is being revised accordingly.

**COMMENT**

Shell requests that the Frontier Discoverer permit be amended to reflect the addition of one engine to the emissions inventory.

Table 1 – Discoverer Emission Units					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
FD-18	A3	Cementing Unit Engine	GM 3-71	147	hp

**EPA RESPONSE**

Total emissions will not cause or contribute to a NAAQS violation. EPA accepts Shell's request to authorize construction and operation of the additional emission unit. The Frontier Discoverer permit is being revised accordingly.

**COMMENT**

Shell requests that the proposed Frontier Discoverer remaining sources (Source Group A3) emission factor of 0.139 lb NO<sub>x</sub>/gal fuel be amended to 0.654 lb NO<sub>x</sub>/gal fuel in the Discoverer Source Group Emission Factors Table. The revised emission factor is supported by the original application.

**EPA RESPONSE**

Shell's request is reasonable, and EPA accepts Shell's request to utilize the emission factor submitted in the original application. The Frontier Discoverer permit is being revised accordingly.

**COMMENT**

Shell requests that EPA amend a typographical error in the proposed Frontier Discoverer permit. The Fennica/Nordica boilers are misidentified as Source Group C2 in the Discoverer Source Group Emission Factors Table. The correct identification for the boilers is Source Group C3.

**EPA RESPONSE**

Shell's request is reasonable, and EPA accepts Shell's request to correctly identify the source group as C3. The Frontier Discoverer permit is being revised accordingly.

**COMMENT**

Shell requests that EPA amend a typographical error in the proposed Frontier Discoverer permit by inserting a 0.455 lb NO<sub>x</sub>/ gal fuel emission factor for Fennica/Nordica other engines (Source Group C2) in the Discoverer Source Group Emission Factors Table. The emission factor is supported by the original application.

**EPA RESPONSE**

Shell's request is reasonable, and EPA accepts Shell's request to insert the fuel-based emissions factor for Source Group C2. The Frontier Discoverer permit is being revised accordingly.

**COMMENT**

Shell requests that EPA amend a typographical error in the proposed Frontier Discoverer permit. Source groups A3 and A4 are reversed in the Frontier Discoverer Source Group Emission Factors table.

**EPA RESPONSE**

Shell's request is reasonable, and EPA accepts Shell's request to correctly identify the source groups noted. The Frontier Discoverer permit is being revised accordingly.

**COMMENT**

Shell requests that the Kulluk and Frontier Discoverer permits be amended to reflect the addition of diesel fuel storage tanks to the emissions inventory. Per vessel, volatile organic compound (VOC) emissions resulting from both working and breathing losses are approximately 36 pounds over a four-month period. EPA's TANKS 4.09d was utilized to predict VOC emissions.

Table 1 – Kulluk Emission Units					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
K-20	T	Fuel Tank	Unknown / Kulluk ID: 5P-10C	680	cubic meters
K-21	T	Fuel Tank	Unknown / Kulluk ID: 5P-10C	676	cubic meters
K-22	T	Fuel Tank	Unknown / Kulluk ID: 5P-10C	247	cubic meters

Table 1 – Discoverer Emission Units					
Unit ID	Source Group	Unit Description	Make/Model	Rating	
FD-24	T	Fuel Tank	Unknown / Discoverer ID: 21P	538	cubic meters
FD-25	T	Fuel Tank	Unknown / Discoverer ID: 29P	267	cubic meters
FD-26	T	Fuel Tank	Unknown / Discoverer ID: 21S	267	cubic meters
FD-27	T	Fuel Tank	Unknown / Discoverer ID: 21S	179	cubic meters
FD-28	T	Fuel Tank	Unknown / Discoverer ID: 22S	150	cubic meters
FD-29	T	Fuel Tank	Unknown / Discoverer ID: 23S	150	cubic meters
FD-30	T	Fuel Tank	Unknown / Discoverer ID: 24S	135	cubic meters

**EPA RESPONSE**

EPA accepts Shell’s request to authorize construction and operation of the additional emission units. The addition of these emission units will not increase VOC emissions above the 250 tpy major source threshold level. Both permits are being revised accordingly.

It is also reasonable to conclude that the contribution of VOC emissions from unidentified diesel fuel storage tanks stationed on support vessels will not increase VOC emissions above the 250 tpy major source threshold level. Shell anticipates maximum VOC emissions of approximately 13 tpy from the Kulluk and 12 tpy from the Frontier Discoverer resulting from the combustion of diesel fuel and the incineration of waste.

**Category B: General Comments Requesting Permit Denial**

**EPA RESPONSE**

After thorough review and careful consideration of the comments requesting that the permits be denied, EPA has decided to issue the permits allowing Shell to conduct exploratory drilling in the Beaufort Sea. One permit, No. R10OCS-AK-07-01 authorizes

Shell to deploy and operate the Kulluk drilling unit and associated support vessels in the outer continental shelf (OCS) near-shore waters of the Beaufort Sea at locations and during time periods approved by the MMS. The other permit, No. R10OCS-AK-07-02 authorizes Shell to deploy and operate the Frontier Discoverer drillships and associated support vessels in the OCS near-shore waters of the Beaufort Sea, at locations and during time periods approved by the MMS.

The final permits that EPA is issuing for Shell are designed to meet the requirements of the Clean Air Act (CAA), and to protect the members and natural resources of the Alaska Native Villages. The emission limits contained in a number of specific permit terms and conditions are expected to curb air pollution sufficiently so that air quality in the region continues to attain the National Ambient Air Quality Standards (NAAQS). The NAAQS are national standards which EPA has established to protect human health and the environment. The requirements in the permits also establish additional requirements that are necessary or appropriate to protect human and environmental health, in accordance with EPA's authorities under the CAA. The permits establish strict, federally enforceable, requirements to control and monitor air emissions. EPA expects that these requirements will provide a verifiable means of ensuring that the Shell exploratory drilling project complies with the federal regulations and is operated in a manner that protects the health and welfare of the Native Villages and their resources.

#### Application Completeness

In addition to requesting authorization to construct and operate portable oil and gas operations, Shell has requested EPA to limit its contiguous or adjacent air pollutant emissions to less than major source threshold levels. The following discussion explains why in EPA's view, sufficient information has been provided to support EPA's final decisionmaking. The regulatory context for the permits is also included.

#### *Application for Minor Permit for Air Quality Protection*

As stated in §1.2.1 of the statement of basis for each proposed permit, "Shell is required to obtain a minor permit for air quality protection pursuant to 18 AAC 50.502(c)(2)(A) of the State of Alaska Requirements Applicable to OCS Sources, December 3, 2005, given that the Kulluk/Frontier Discoverer is a portable oil and gas operation as defined at 18 AAC 990(124)."

As evidenced by the administrative record for this permitting action, Shell has submitted information as requested by EPA and beyond the scope of ADEC's forms. EPA does not believe additional information is required or necessary in order to proceed to final decisionmaking.

#### *Application for Minor Permit Establishing Owner Requested Limit*

Pursuant to 18 AAC 50.540(j), "An application for a minor permit establishing an owner requested limit (ORL) must include the information and materials required under 18 AAC 50.225(b)(2)-(7)." Specifically,

- 1) *a list of all emission units at the stationary source;*

- 2) *a calculation of the stationary source's actual emissions and potential to emit air pollutants;*
- 3) *a description of the proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's potential to emit and the allowable emissions;*
- 4) *a description of a verifiable method to attain and maintain the limit, including monitoring and recordkeeping requirements;*
- 5) *citation to the requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement; and*
- 6) *a statement that the owner or operator of the stationary source will be able to comply with the limit.*

18 AAC 50.225(b)(2)-(7)

A brief discussion of how each one of the six ORL application data elements was satisfied is discussed here.

1. A list of all emission units at the stationary source.  
Shell has submitted a list of emission units as evidenced by the identification of the emissions generating equipment listed in the proposed and final permits. The list has expanded since Shell's initial applications were submitted and is available at EPA's website at [http://yosemite.epa.gov/R10/Airpage.nsf/webpage/Outer+Continental+Shelf+\(OC+S\)](http://yosemite.epa.gov/R10/Airpage.nsf/webpage/Outer+Continental+Shelf+(OC+S)).
2. A calculation of actual and potential emissions.  
See Appendix B of the original applications for a multi-pollutant, multi-year projection of equipment specific emissions resulting in facility-wide NO<sub>x</sub> emissions equivalent to Shell's ORL. Upon request, Shell submitted projected fleet activity information to EPA electronically on March 8, 2007. The fleet activity information projects fuel usage given a handful of operating scenarios. Worst-case fuel usage data was then manipulated to provide a basis for the emissions calculations in the application. The information demonstrates that Shell has attempted to forecast the fleet activity necessary to complete exploration at a drill site under multiple operating conditions. The information is available for review as an element of the administrative record.
3. A description of the ORL along with its impact upon emissions.  
Again, see Appendix B of the original applications. Assuming fleet-wide drill-site NO<sub>x</sub> emissions equal to 245 tpy and a sulfur content of 0.19 percent by weight in diesel fuel, Shell projects the following worst-case emissions per drill site:

Year / Drillships	NO <sub>x</sub>	CO	PM	VOC	SO <sub>2</sub>
'07 Kulluk	245	82	8	13	23
'08 & '09 Kulluk	245	48	7	11	17
'07 – '09 F.D*.	245	48	7	12	18

\* Frontier Discoverer

4. A description of monitoring and recordkeeping requirements.  
Shell provided a limited discussion of the monitoring and recordkeeping necessary to assure compliance with the PSD-avoidance limits being requested. As the administrative record documents, Shell provided information to EPA to include monitoring and recordkeeping requirements to assure compliance with the Owner Requested Limits (ORL). On May 24, 2007, Shell submitted ADEC's ORL application Form H to supplement the record. The completed Form H identifies the PSD program citation as 18 AAC 50.300(c).
5. Identification of the regulatory requirement the applicant is seeking to avoid.  
Shell is seeking to avoid PSD as indicated in the heading in the permits for Conditions 7, 8 and 9. In the absence of the ORL, NO<sub>x</sub> and SO<sub>2</sub> emissions would be greater than 250 tpy, thus triggering PSD review. As evidenced by the emissions calculations provided by Shell, the requested fuel sulfur content limit (0.19 percent by weight) results in projected SO<sub>2</sub> emissions of around 20 tpy. The fuel sulfur content limit could be relaxed by a factor of 10 and Shell would still be able to demonstrate compliance with a 250 tpy threshold.
6. Statement from owner/operator that applicant will comply with the ORL.  
As stated by Susan Childs of Shell in a June 5, 2007 e-mail to EPA, "Shell Offshore Inc. will be able to comply with the requested Owner Requested Limits (ORL) submitted with the application materials for limiting NO<sub>x</sub> emissions from the Kulluk and Frontier Discoverer stationary sources."

Shell's initial December 29, 2006 applications did include a completed ADEC *Stationary Source Identification Form* tailored for ORL requests. The completed form indicated that attachments were being provided to elaborate upon requested fuel use limitations and a fuel sulfur content limitation. Although it is not clear whether those specific attachments were actually included in the original application, other material clearly indicated that Shell intended for EPA to limit (a) NO<sub>x</sub> emissions to less than 245 tpy and (b) the sulfur content in fuel to less than 0.19 percent by weight. This information is presented in Appendix B of the original applications.

Although EPA determined the applications complete in a February 2, 2007 letter to Shell, EPA continued to receive additional information so as to facilitate decisionmaking as evidenced by the administrative record. EPA does not believe additional information is required or necessary in order to proceed to final decisionmaking.

### Application Approvability

The criteria EPA utilized to determine whether to approve or deny Shell's applications is listed at 18 AAC 50.542(f)(1) and (f)(8).

#### *Application for Minor Permit for Air Quality Protection*

Pursuant to 18 AAC 50.542(f)(1), EPA will deny a minor permit application if construction and operation will result in a violation of a requirement of 18 AAC 50.045 – 18 AAC 50.090 or an ambient air quality standard. The title of Articles 18 AAC 50.045 through 18 AAC 50.090 applicable on the OCS is as follows:

- 18 AAC 50.045 – Prohibitions
- 18 AAC 50.050 – Incinerator Emissions Standards
- 18 AAC 50.055 – Industrial Processes and Fuel-Burning Equipment
- 18 AAC 50.065 – Open Burning
- 18 AAC 50.075 – Wood Fired Heating Device Visible Emission Standards
- 18 AAC 50.080 – Ice Fog Standards
- 18 AAC 50.085 – Volatile Liquid Storage Tank Emission Standards
- 18 AAC 80.090 – Volatile Liquid Loading Racks and Delivery Tank Emission Standards

The ambient air quality standards are listed at 18 AAC 50.010.

From among these underlying regulations, EPA incorporated requirements for which compliance demonstrations were deemed necessary and appropriate in the permits. The requirements are summarized here along with a brief discussion:

- Drillships incinerators must demonstrate compliance with the 20% visible emissions standard. 18 AAC 50.050(a).
- Drillships fuel-burning equipment must demonstrate compliance with the 20% visible emissions standard. 18 AAC 50.050(a).
- Drillships fuel-burning equipment must demonstrate compliance with the 0.05 gr/dscf particulate matter standard. 18 AAC 50.055(b).
  - For some equipment, Shell demonstrated through vendor emissions data and calculations that some engines would comply.
  - For other equipment, Shell is being required to combust 500 ppm weight sulfur diesel fuel and install air pollution control equipment to demonstrate compliance.
- Drillships fuel-burning equipment may not generate sulfur-compound emissions, expressed as sulfur dioxide, in excess of 500 ppm averaged over a period of three hours. 18 AAC 50.055(c),

- Shell is prohibited from combusting diesel fuel with greater than 0.19 percent by weight sulfur based upon its ORL. Combusting such a fuel will never result in exhaust gas SO<sub>2</sub> concentrations greater than 500 ppm.

According to a comment submitted by ADEC on the proposed permit, the PM emissions standard must be achieved at worst-case operating conditions. In response to this ADEC comment, EPA reviewed the emissions data provided by Shell. Upon review of this data, EPA realized that the data suggested that the Kulluk main engines would not comply with the PM emission standards at anticipated operating loads. EPA communicated its concerns to Shell. In response, Shell indicated its intentions to employ a load bank to sustain engine operating loads to achieve compliance. Based on these communications, EPA has decided to require Shell to (1) stack test one of the engines at all load conditions for which Shell intends to operate, (2) develop a correlation between particulate matter emissions and load, and (3) continuously determine compliance by tracking and recording operating load.

Condition 12.4 of the final permit now states as follows:

*12.4 Compliance with Condition 12 shall be determined for Unit K-1, K-2, and K-3 pursuant to the following terms:*

- a. Prior to mobilizing the Kulluk for the first time at the beginning of a drilling season, the permittee shall conduct stack testing as follows:*
  - (i) Perform a stack test according to an EPA-approved stack test protocol on at least one of the engines at three or more load points representing the expected operating range of the engines.*
  - (ii) Before conducting any stack tests, the permittee shall submit a plan to EPA. The plan must include the methods and procedures to be used for sampling, testing, and quality assurance, and must specify how the emission unit will operate during the test and how the permittee will document that operation. The permittee shall submit a complete plan within at least 30 days before the scheduled date of any test unless EPA agrees in writing to some other time period. Retesting may be done without resubmitting the plan.*
- b. The permittee shall determine particulate matter emissions based upon engine load conditions as follows:*
  - (i) Within 15 days of completing the testing, the permittee shall submit to EPA for approval a correlation of operating load (kW-hr) to PM emissions rate (gr/dscf) along with the stack test report upon which the correlation is founded.*

- (ii) *The correlation shall be considered approved within 15 days of its receipt at EPA unless :*
  - (A) *EPA disapproves or partially approves the correlation, or*
  - (B) *EPA requests additional information.*
- c. *The permittee shall monitor, calculate, and record emissions data as follows:*
  - (i) *Monitor and record each engine's operating load at least once every 15 minutes. At that time, identify whether the engine is transitioning between operating loads.*
  - (ii) *Every 15 minutes, calculate and record each engine's preceding 3-hour average operating load.*
- d. *The permittee shall report to EPA as follows:*
  - (i) *The permittee shall report annually to EPA a summary of those 3-hour time periods during which an engine emitted, on average, particulate matter in concentrations in excess of the 0.05 gr/dscf as determined using the EPA-approved correlation.*
  - (ii) *The report shall be submitted no later than December 31 for time period beginning December 1 (of the previous calendar year) and ending November 30.*

ADEC also questioned the absence of a permit condition prohibiting the permittee from causing or contributing to an ambient air quality standard violation. Although EPA is confident that the proposed permit would have prevented Shell from causing or contributing to an ambient air quality standard violation, EPA is amending the permit to explicitly prevent Shell from doing so. Condition 14 of the final permit now states, "The permittee shall not cause or contribute to a violation of a NAAQS of Alaska (18 AAC 50.110)."

Shell has requested EPA to authorize construction and operation of additional emission units not previously identified or reviewed prior to EPA's March 30, 2007 preliminary decision. Shell's request was submitted during the public comment period on April 12, 2007.<sup>1</sup> Shell also submitted additional modeling to support the determination that air pollutant emissions will not cause or contribute to an ambient air quality standard violation. On May 31, 2007, Shell requested that a 147-hp cementing engine (FD-18) be

---

1

[http://yosemite.epa.gov/R10/AIRPAGE.NSF/283d45bd5bb068e68825650f0064cdc2/f8aeb107eec9de9b88256b7d00062fc3/\\$FILE/Shell%20source%20list%20update%2004%2012%202007.pdf](http://yosemite.epa.gov/R10/AIRPAGE.NSF/283d45bd5bb068e68825650f0064cdc2/f8aeb107eec9de9b88256b7d00062fc3/$FILE/Shell%20source%20list%20update%2004%2012%202007.pdf)

added to the inventory. EPA determined that such a minor addition to the inventory, alone, will not change EPA's conclusion that emissions will not cause or contribute to an ambient air quality standard violation.

*Application for Minor Permit Establishing Owner Requested Limit*

Pursuant to 18 AAC 50.542(f)(8), EPA will approve a minor permit establishing an ORL if (a) the source is capable of complying with the limit and (b) the permit conditions are adequate for determining continuous compliance with the limit. The proposed permits provided conditions requiring Shell to comply with the underlying regulations as summarized here.

- Emissions from a drillships and its support vessels operating at or within 25 miles of the drill site are prohibited from emitting more than 245.0 tons of NO<sub>x</sub> within any rolling 52-week period while mobilizing, operating, and demobilizing the drillships within 25 miles of a drill site. Shell emission-generating activity shall be aggregated within 500 miles of a drill site.
- Shell shall not combust any liquid fuel with sulfur content greater than 0.19 percent by weight in any emission unit on either a drillships or a support vessel.

Under the operating circumstances and ice conditions anticipated by Shell and presented in the application, Shell is capable of complying with the 245 tpy emissions cap. EPA has no information suggesting that Shell's predictions are unreasonable.

ADEC submitted a comment addressing a deficiency in EPA's preliminary decision. ADEC highlighted that each permit fails to require that fuel flow metering equipment achieve and maintain a minimum level of accuracy. EPA acknowledges this deficiency, and EPA is addressing this comment by adding the following requirements in each permit:

- 7.7.b The permittee shall monitor and record cumulative Source Group fuel usage at least once every 7 days.
  - (i) Each fuel flow meter used to satisfy the requirement of Condition 7.7.b. shall measure the fuel flow rate with accuracy equal to or better than 2 percent of the meter's upper range value.
  - (ii) Collect information from the manufacturer of each fuel flow meter so as to determine its accuracy. Submit this information to EPA prior to the beginning of a drilling season.
  - (iii) Maintain the accuracy of each fuel flow meter in accordance with manufacturer's recommendations.

ADEC stated, "[v]erifiable calculations are required to prove that under worst case conditions, with the methods and accuracy being implemented, the owner or operator will

comply with the limit that has been requested.” ADEC is asking EPA to either (a) reduce the PSD-avoidance NO<sub>x</sub> emissions cap to take into account the uncertainty of both the emission factors and monitored values, or (b) incorporate safety factors into the equation based upon the assumption that emission factors and monitored values are biased low at the limit of each value’s tolerance range. A discussion of both items follows below.

*(A) Reducing the PSD-avoidance NO<sub>x</sub> Emissions Cap*

NO<sub>x</sub> emissions using fuel-based emissions factors are quantified as follows:

$$\text{Weekly NO}_x \text{ Emissions (tons)} = \left[ \sum_{i=\text{SourceGroup}} (F_i \times EF_i)_i \right] / 2000,$$

- i = Source Group
- F<sub>i</sub> = fuel consumption for Source Group i in units of “gallons diesel fuel combusted per week”
- EF<sub>i</sub> = emission factor for Source Group i in units of “lb NO<sub>x</sub> emitted per gallon diesel fuel combusted”

The equipment for which this equation is used to determine emissions is expected to contribute less than 10% of total project emissions. Given the improvements to the permits indicated above, the uncertainty of fuel flow metering equipment as delivered is limited to ±2%. The uncertainty associated with the “lb NO<sub>x</sub> / gallon diesel fuel” emissions factor is not known given that many of the factors are extracted from EPA’s AP-42. AP-42 does not quantify the uncertainty associated with its emissions factors.

NO<sub>x</sub> emissions using load-based emissions factors are quantified as follows:

$$\text{Weekly NO}_x \text{ Emissions (tons)} = \left[ \sum_{j=\text{SourceUnit}} \left[ \sum_{n=\text{readings}} L_{j,n} \times EFE_{j,n} \right] \div m_j \right] / 2000,$$

- j = Source Unit within Source Group
- m<sub>j</sub> = number of load readings observed for a given hour for Source Unit j
- n = number of load readings observed during the week for Source Unit j
- L<sub>j,n</sub> = power output in units of “kilowatts” measured for Source Unit j during a given time interval during which a load reading is observed
- EFE<sub>j,n</sub> = load-dependent emission factor for Source Group i in units of “lb NO<sub>x</sub> emitted per Kilowatt-hour of power output”

The equipment for which this equation is used to determine emissions is expected to contribute at least 90% of total project emissions. The uncertainty associated with (a) the measured “kilowatts” value and (b) the load-dependent emissions factor is not known.

After consideration of uncertainties in both fuel-based and load-based emissions calculations, EPA has decided not to reduce the NO<sub>x</sub> emission cap. EPA is not aware of any regulation or guidance specifying if, or even how, an air permitting authority is supposed to address emission measurement uncertainty in the context of a PSD-avoidance cap. Even if EPA could quantify the uncertainty in emissions factors and monitored parameters, EPA does not think it is appropriate to reduce the emissions cap to accommodate the possibility that all inputs are biased low to a degree equivalent to the each parameter’s respective tolerance range. In EPA’s view, there is an equal probability that the inputs may be biased high.

*(B) Incorporate Safety Factors into the NO<sub>x</sub> Emissions Cap Equation*

Again, without an understanding of the uncertainty introduced by inputs to the compliance equations, EPA has determined that it is unreasonable to develop a safety factor. Even if the uncertainties of each measured parameter and each developed emissions factor were known, EPA does not think that it is appropriate to introduce safety factors to accommodate the remote possibility that all inputs are biased low.

## **Category C: EPA Application Process**

### **Comment C-1: Minor Permit Application Process**

#### **COMMENT**

Why does EPA allow Shell Oil to write the permit and then make the regulations?

#### **EPA RESPONSE**

##### OCS Regulations

EPA is acting upon Shell’s applications in light of the applicable federal requirements in 40 CFR Part 55.<sup>2</sup> This regulation includes the State of Alaska Requirements Applicable to OCS Sources, December 3, 2005.<sup>3</sup>

EPA acknowledges that Shell has submitted detailed information to EPA, including specific permit terms and conditions, and that Shell has been very engaged in the process as evidenced by the volume of e-mail and hardcopy correspondence in the administrative record. During this time, EPA provided Shell with a better understanding of the

---

<sup>2</sup> [http://www.access.gpo.gov/nara/cfr/waisidx\\_06/40cfr55\\_06.html](http://www.access.gpo.gov/nara/cfr/waisidx_06/40cfr55_06.html)

<sup>3</sup> <http://www.epa.gov/fedrgstr/EPA-AIR/2007/February/Day-08/a2132.pdf>

regulatory requirements, and Shell provided EPA with information regarding the exploratory drilling operation. However, contrary to the commenter's claim, it is EPA who determines what is appropriate to include in the permit and EPA writes and issues the permit. Similarly, it is EPA, rather than Shell that promulgates regulations.

## **Comment C-2: Minor Permit Application Completeness Determination**

### **COMMENT**

A number of commenters suggest that the application materials that Shell submitted are incomplete and/or confusing. Commenters contend that Shell should be required to submit a revised application, not merely an "addendum," or the informal Email requesting an indefinite time frame. In addition, commenters also stated that Shell's so-called "public comments" including "source list update," "Kulluk Support list update," "Frontier Discoverer Support Vessels Update," are actually either information that was deficient in the original permit application or changes to their exploration plan. The commenters believe that this process is unacceptable and that the public and EPA deserves the right to review one complete application that contains all the required information, not bits and pieces. Additionally, a commenter asserts that Shell's application does not include all required supporting technical information. One commenter indicated that the information was not submitted on particular forms. Another commenter requests that EPA deny these permits at this time and request more information from the applicant.

### **EPA RESPONSE**

Subsequent to the notice of EPA's preliminary decision on April 5, 2007, Shell has submitted additional information to EPA. The submissions included information such as a revised emission inventory, confirmation that certain emissions activities won't occur, additional modeling for previously unidentified emissions units, the utilization of load banks to satisfy pm emission standards, fuel flowmeter measurement uncertainties, and a commitment to comply. Shell is not required to submit the information on specific forms or to use a particular format. Please refer to EPA's response to comments, Category B.

The additional information is in the administrative record and available upon request by contacting Natasha Greaves at 206.553.7079 or [greaves.natasha@epa.gov](mailto:greaves.natasha@epa.gov). Information is also available at [http://yosemite.epa.gov/R10/AIRPAGE.NSF/webpage/Outer+Continental+Shelf+\(OCS\)](http://yosemite.epa.gov/R10/AIRPAGE.NSF/webpage/Outer+Continental+Shelf+(OCS)). EPA has determined that the information is sufficient to issue the final permit.

## COMMENT

ADEC commented that the minor permit application process includes the requirements of 18 AAC 50.540(j), Owner Requested Limits, which requires the permittee to include the information and materials required under 18 AAC 50.225(b)(2) – (7):

- (2) A list of all emission units at the stationary source;
- (3) A calculation of the stationary source's actual emissions and potential to emit (PTE) air pollutants;
- (4) A description of the proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's PTE and the allowable emissions;
- (5) A description of the verifiable method to attain and maintain the limit, including monitoring and recordkeeping;
- (6) Citation to the requirements that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement; and
- (7) A statement that that owner or operator of the stationary source will be able to comply with the limit.

## EPA RESPONSE

[Refer to EPA response to comments, Category B.](#)

## COMMENT

In their comments, ADEC noted that as part of Shell's pre-construction air permit application to the EPA, Appendix C contains ADEC's ORL Application form. This application form lists "fuel use limitations" and "fuel sulfur content limitation" as attachments included, but there are no attachments included with Appendix C. The application should contain these attachments.

## EPA RESPONSE

EPA agrees that there were no attachments provided with the completed ORL application form. However, fundamental ORL information was provided on other pages of the original application. On page B-29 of the Kulluk application, Shell presents a fuel sulfur content limitation of 0.19 percent by weight in an explanation of its emissions factors. On page 8 of the same application, Shell presents a 245 tpy NO<sub>x</sub> emissions cap. On page B-14 of the Frontier Discoverer application, Shell presents a fuel sulfur content limitation of 0.19 percent by weight in an explanation of its emissions factors. On page 7 of the same application, Shell presents a 245 tpy NO<sub>x</sub> emissions cap.

The information initially submitted to EPA served to be a starting point from which EPA and Shell worked together to find an acceptable monitoring, recordkeeping, and reporting strategy to verify compliance. The strategy more fully articulated in Shell's February 7, 2007 submittal is acceptable to EPA.

#### **COMMENT**

The NSB stated that Shell incorrectly concludes in their application, at Section 3.2 that ADEC has no direct authority over the review and approval of the Shell project and its air permit. The NSB believes that Shell's position is incorrect. Under the Alaska Coastal Management Program (ACMP), the Alaska Department of Natural Resources (ADNR) and ADEC are required to ensure that Shell's Exploration Plan, permits, and authorization meet the ACMP statewide and local standards. It is the NSB's belief that Shell's proposed project does not meet the requirements of 11 AAC 110 and 112 because it does not comply with all federal and state air quality laws and regulations.

#### **EPA RESPONSE**

The statement in question has had no effect upon EPA decisionmaking. EPA believes that the permits we are issuing to Shell are consistent with federal law and EPA regulations.

#### **COMMENT**

One commenter asserts that Shell's application does not include all required supporting technical information. For example, there is no information on the Jim Kilabuk, fuel tanks, or other emission sources that vent to the atmosphere or on the well testing plans, baseline emission monitoring, site specific meteorology, and fuel source and compositional analysis, among other required items.

#### **EPA RESPONSE**

In a May 24, 2007 e-mail to EPA, Air Sciences (Shell's consultant) states, "There will be no oil or gas flares or crude oil vents, and none are listed in the draft permits. The only fuel on board the drill vessels will be diesel and the inventory of tanks is provided as an attachment. The estimation of VOC emissions from the tanks is also provided." The VOC emissions estimation, utilizing EPA-approved TANKS 4.09d model, indicates VOC emissions of 36 pounds over a 4-month period for either drillships due to losses from diesel fuel storage tanks. VOC emissions across the entire fleet of vessels are not going to approach the 250 tpy major source threshold level.

With respect to the Jim Kilabuk vessel, EPA essentially needs to know the vessel's potential NO<sub>x</sub>, SO<sub>2</sub>, and PM<sub>10</sub> emissions so as to conduct an ambient air quality analysis. That information has been provided to EPA by Shell. EPA also needs to know the appropriate emission factors for emissions units on the vessel so as to determine

compliance with the NO<sub>x</sub> cap. That information has been provided as well to EPA by Shell.

Well testing plans are not a required element of an application for a minor air quality permit.

Shell indicates that it intends to utilize No. 2 diesel fuel, and is required to report the sulfur content of the fuel pursuant to Condition 9 of the permit which states,

- 9. Sulfur Dioxide (SO<sub>2</sub>) Emission Limitation.** *The permittee shall not combust any liquid fuel with sulfur content greater than 0.19 percent by weight in any emission unit on the Discoverer or a support vessel.*
- a. *Monitoring and Recordkeeping. Monitor and keep records as follows:*
- (i) *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 and all support vessels. The permittee shall obtain a representative sample of the fuel and analyze the sample for sulfur content using ASTM D-129, D-2622, or D-4294.*
  - (ii) *Thereafter, determine and record the sulfur content upon receiving each fuel shipment.*
    - (A) *Obtain a representative sample of the fuel delivered and analyze the sample for sulfur content using ASTM D-129, D-2622, or D-4294; or*
    - (B) *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 one of the ASTM methods listed above.*
- b. *Within 3 days of identification, report to EPA any instance of a liquid fuel with sulfur content greater than 0.19 percent by weight being combusted in any emission unit on the Discoverer or a support vessel.*

Also see EPA response to Comment B-1 with respect to application completeness.

Also see EPA response to Comment D-1 with respect to baseline monitoring.

Also see EPA response to Comment D-2 with respect to site specific meteorology.

## **COMMENT**

EPA Received one comment stating that the United States Coast Guard (USCG) has not approved Shell's request for a safety exclusion zone.

## **EPA RESPONSE**

Shell initially utilized SCREEN3 to conduct the ambient impact analysis, and the results were submitted to EPA as part of the original application. That modeling also implemented a 500-meter safety zone within which no modeling receptors were activated. Shell later conducted an ambient impact analysis utilizing ISC-PRIME without the presence of a safety zone. All modeling receptors were activated, and the results indicated no exceedances of any NAAQS. The results were submitted to EPA on March 26, 2007.

Given that Shell has demonstrated compliance with ambient air quality standards at all points outside the perimeter of the drillships, the USCG denial of Shell's request for a safety exclusion zone is irrelevant to EPA's decisionmaking.

## **Category D: Modeling Analysis**

### **Comment D-1: Data Sets for Modeling Air Impacts**

## **COMMENT**

Several commenters stated that EPA is relying on monitoring and modeling systems developed in the 1970s and is not using the latest technology used in other locations. In addition, there was concern about whether or not the models used were developed specifically for the Beaufort Sea.

## **EPA RESPONSE**

The Industrial Source Complex (ISC) model used to predict ambient air quality impacts was originally developed in 1978. However, EPA has maintained the model or program by providing revisions and adding new features to make the model more functional. For example, several years ago EPA added a new feature into the program that better characterizes plume flow around and over buildings. The model was subsequently renamed ISC-PRIME.

In addition, it is important to note that before EPA releases any revisions or new features in a model, the revisions or new features, if applicable, are thoroughly evaluated, compared with actual data, and peer reviewed. The test results of the revisions or new features should fall into certain acceptable ranges or they are not implemented.

Shell modeled the project emission sources using a screening technique and worst meteorological conditions. These models are EPA accepted and were implemented in accordance with EPA regulations and guidance.

## **COMMENT**

Several commenters and the NSB stated that EPA's regulatory decisions are still based on scant data and models which have not been validated under Arctic conditions, with no monitoring data whatsoever available for some of the most concerning pollutants – namely PM<sub>2.5</sub> and the hazardous air pollutants commonly associated with oil and gas operations.

## **EPA RESPONSE**

The screening methods used by Shell to model the project's emissions are considered appropriate for the arctic climate. It is an EPA model used in accordance with EPA guidance.

The air quality effects of sources not included in the modeling analysis were accounted for by using background air quality data considered to be adequately or conservatively representative of the project area.

The meteorological conditions employed in the screening modeling methodologies are designed to cover the complete range of possible dispersion conditions existing in the atmosphere, even extreme low wind speed, inversion conditions.

## **COMMENT**

Resisting Environmental Destruction on Indigenous Lands (REDOIL) and the Northern Alaska Environmental Center (NAEC) both commented that the National Research Council (NRC) identified major data gaps in North Slope baseline data and air quality monitoring in its study, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* at 153 (2003), and these have yet to be rectified. They noted that the lack of baseline data is worse for the pristine areas far from Prudhoe Bay where drilling is proposed to take place.

## **EPA RESPONSE**

Collecting site specific air quality data is unnecessary for Shell's proposed project. The ADEC and EPA determined that the air quality data collected at Badami met EPA's quality assurance requirements and are adequately representative of background air quality levels in the impact area of the proposed sources.

## **Comment D-2: Ambient Air Quality Analysis**

### **COMMENT**

The NAEC and others commenters indicated that the Shell's baseline monitoring information is insufficient. Shell's application (Dec. 29, 2006, p. 24) uses ambient air quality levels from 1999 monitoring near the Badami oil field which is inappropriate as it is on land. It is not within the affected marine waters of the Beaufort Sea, or along the most proximal coasts of the Arctic National Wildlife Refuge (ANWR), Kaktovik, etc. In addition, NAEC believes that the MMS conducted an inadequate analysis of air pollution impacts with no site specific ambient air quality monitoring information, and only a few sentences on air quality impacts none of which are site specific.

### **EPA RESPONSE**

EPA determined that collecting site specific air quality data is unnecessary for Shell's proposed project. The ADEC and EPA determined that the air quality data collected at Badami met EPA's quality assurance requirements and are adequately representative of background air quality levels in the impact area of the proposed sources.

Prior to conducting the modeling, Shell discussed the models and assumptions they planned to use in predicting ambient air quality impacts. Since Shell followed the applicable regulations and guidance, EPA has no objection to the modeling. (See additional discussion above.)

It should be noted that the air quality modeling protocol for each application is reviewed on a case-by-case basis. Past projects may have been permitted under a different set of regulations such as Prevention of Significant Deterioration (PSD).

See EPA's response to comments, Category R

### **COMMENT**

The NSB commented that Shell's ambient air quality analysis is not site-specific, does not use appropriate background monitoring data for all OCS source locations, does not use an EPA approved meteorologic data set, and is based on a simple single pollution stack screening model, rather than a site-specific, multiple stack emission model.

Shell's application initially relied on an extremely simplistic screening model (SCREEN3), and was recently supplemented with ICS-PRIME analysis. Shell's air pollution modeling approach is not site-specific and does not meet the technical quality required by the EPA or MMS on past OCS exploration projects in the Beaufort Sea using the Kulluk. For example, the EPA and MMS required ARCO to use EPA's approved Industrial Source Complex Short-Term (ISC2) air dispersion model, complemented by

MMS' Offshore Coastal and Dispersion (OCD) model for its 1993 air permit application for operation of the Kulluk to drill an exploration well in the OCS of the Beaufort Sea. The EPA required Shell to submit an ambient air quality analysis to demonstrate compliance with all applicable air quality standards. Shell's ambient air quality analysis, which purports to conservatively represent operations of all OCS sources 24 hours per day over a 60 day period, does not meet this standard.

First, the model does not include all OCS combustion sources operating 24 hours per day for 60 days. For example, the air model only included 2 engines and 1 boiler, when there are actually 3 main engines and 2 boilers on the Kulluk.

Second, the model is not based on representative meteorological data collected in the region of operation and approved by the EPA. Section 4.3 of Shell's application states: "it was determined that representative meteorological data meeting U.S. EPA's requirements is not available for the project location."

Third, lacking representative meteorological data, Shell used a less sophisticated air pollution model to estimate emission impacts. Shell selected the EPA's SCREEN3 model that does not include site-specific meteorologic data and is only capable of simplistically estimating one (1) hour air pollution concentrations from a single source at a time. The EPA's SCREEN3 model<sup>4</sup> cannot explicitly determine the maximum impacts from multiple sources. North Slope air pollution sources are typically modeled using ISC, a much more sophisticated, site-specific, multiple source air pollution modeling tool, which can examine maximum impacts over various time intervals at various distances from the source. The EPA does not recommend use of SCREEN3 for computing seasonal or annual emission estimates.

## **EPA RESPONSE**

A screening technique was used to predict ambient concentration impacts. The meteorology used in the technique consists of worst case hourly conditions which EPA believes will result in conservative concentration predictions. Section 2.3 of the Guideline on Air Quality Models contained in Appendix W of 40 CFR Part 51 identifies two levels of models, a screening technique and a refined technique. The screening technique uses assumptions that would result in a conservative estimate of air pollutant impacts. If this technique does not show a possible exceedance of an air quality standard, further analysis is not required. On the other hand, if a possible exceedance is predicted using a screening technique, a more refined technique including onsite meteorological data may be applied which better estimates the predicted concentration impact.

---

<sup>4</sup> EPA SCREEN3 Model User's Guide, September 1995, EPA-454/B-95-004.

All sources proposed for routine operations were considered in the air quality modeling analysis. Emissions from emergency or upset conditions are generally not considered in the air quality impact analysis for NSR permits.

Shell followed Section 2.3 of the Guideline on Air Quality Models in predicting the air pollutant impacts resulting from the operation of the Kulluk and Frontier Discoverer. Initially, Shell used the SCREEN3 model to predict ambient pollutant concentrations. They subsequently used the ISC-PRIME model with the SCREEN3 meteorology in order to quantify ambient concentrations in the wake cavity. The latter model predictions did not reveal any exceedance of an air quality standard that could contribute to a NAAQS violation. Hence, a refined technique using the Offshore and OCD and site specific meteorology was not necessary.

## **COMMENT**

The NSB also commented that site-specific emissions data was not collected to establish ambient background concentrations. Rather than collecting background data, Shell used BP's Arctic North Slope Eastern Region monitoring program data from 1999. While Shell asserts this data has been reviewed and approved by ADEC for use on this project, there is no evidence of any ADEC approval for use of this data at all of the exploration sites planned during the 2007-2009 exploration period. Background data east of British Petroleum's Badami facility, certainly would not be representative of Shell's proposed exploration sites planned north and west of Prudhoe Bay.

## **EPA RESPONSE**

It was suggested that air quality data collected at Kuparuk, rather than Badami, would be more representative of the project area. EPA reviewed an ADEC memo summarizing the Kuparuk data and discussed with ADEC staff the footnotes and findings in the memo. Because the memo stated that the particulate matter 10 (PM<sub>10</sub>) maximum 24-hour and annual average measured concentrations represented an "upper bound estimate" and could be higher than actual levels by a factor of two, ADEC and EPA concluded that the Kuparuk data does not meet EPA quality assurance requirements, and therefore can not be used to represent background air quality levels. Moreover, because of existing local industrial sources in the Kuparuk area, the Kuparuk air quality data are not considered adequately representative, and are expected to be higher than levels in the proposed project area. Use of the Kuparuk data for SO<sub>2</sub> and nitrogen dioxide (NO<sub>2</sub>) is an over-estimate of background air quality levels, however, it still does not result in a total air quality impact that would exceed the NAAQS. Carbon monoxide (CO) was not measured at Kuparuk.

## Category E: Emission Inventory and Calculations

### Comment E-1: Total Emissions

#### COMMENT

A number of comments ask what the total emissions from the project are.

#### EPA RESPONSE

Shell estimates worst-case annual emissions (drillships & support vessels) from a particular drill site as follows:

Drill Sites Emissions (tons)

Year / Drillships	NO <sub>x</sub>	CO	PM	VOC	SO <sub>2</sub>
'07 Kulluk	245	82	8	13	23
'08 & '09 Kulluk	245	48	7	11	17
'07 – '09 F.D.*	245	48	7	12	18

\* Frontier Discoverer

EPA understands that Shell may drill up to three wells per drillships in a season. Worst-case emissions would occur in 2007. Total 2007 Shell Beaufort Sea worst-case annual emissions across multiple drill sites separated by more than 500 meters are as follows:

Drill Sites Emissions (tons)

Year / Drillships	NO <sub>x</sub>	CO	PM	VOC	SO <sub>2</sub>
Kulluk	735	246	24	39	69
Frontier Discoverer	735	144	21	36	54

Because of the distance separating both Nuiqsut and Cross Island from the nearest existing Shell OCS lease block, modeling was not performed to predict emissions at either one of these locations. Nuiqsut is approximately 45 miles from the nearest OCS lease block held by Shell while Cross Island is 15 miles from Shell's nearest lease block.

Ambient pollutant concentrations were predicted as far away as 3.7 miles from a drillships. EPA would expect that maximum impact from the drilling operation to occur near the drill rig because of downwash. Impacts at a downwind distance of 15 miles are small when compared to the modeled impacts.

#### COMMENT

One commenter asked if EPA considered the cumulative emissions in Prudhoe Bay, Kuparuk and Nuiqsut areas.

**EPA RESPONSE**

The ambient air quality impact analysis only considered the emission sources from the proposed projects. A cumulative impact analysis is not required under our regulations. However, the analysis did include background air quality measurements from Badami to account for contributions of nearby sources. The predicted concentrations from the project plus the background air quality measurements were compared to air quality standards. No violations of any NAAQS were predicted.

**COMMENT**

One commenter asked how the emission calculation changed if the emission sources are idle versus working continually 24 hours a day, 7 days a week.

**EPA RESPONSE**

Shell has completed an ambient air quality impact analysis which shows under a worst-case operating scenario that the drill rig and support vessels will not cause an exceedance of any NAAQS.

**COMMENT**

A commenter asked how much oil or fuel will be stored onsite for the project.

**EPA RESPONSE**

Shell provided EPA with the following information.

Unit ID	Source Group	Unit Description	Make/Model	Rating	
K-20	T	Fuel Tank	Unknown / Kulluk ID: 5P-10C	680	cubic meters
K-21	T	Fuel Tank	Unknown / Kulluk ID: 5P-10C	676	cubic meters
K-22	T	Fuel Tank	Unknown / Kulluk ID: 5P-10C	247	cubic meters
FD-24	T	Fuel Tank	Unknown / Discoverer ID: 21P	538	cubic meters
FD-25	T	Fuel Tank	Unknown / Discoverer ID: 29P	267	cubic meters

Unit ID	Source Group	Unit Description	Make/Model	Rating	
FD-26	T	Fuel Tank	Unknown / Discoverer ID: 21S	267	cubic meters
FD-27	T	Fuel Tank	Unknown / Discoverer ID: 21S	179	cubic meters
FD-28	T	Fuel Tank	Unknown / Discoverer ID: 22S	150	cubic meters
FD-29	T	Fuel Tank	Unknown / Discoverer ID: 23S	150	cubic meters
FD-30	T	Fuel Tank	Unknown / Discoverer ID: 24S	135	cubic meters

No information was provided for VOC emissions generated by support vessels. Given that VOC emissions due to evaporative losses from diesel fuel storage tanks is relatively insignificant, EPA believes no further information is required prior to final decisionmaking.

**Comment E-2: Potential to Emit Calculations**

**COMMENT**

A number of comments question the potential to emit calculation relied on for the permit. Specifically commenters allege that EPA ignored important sources of potential emissions. In particular, a commenter asserts that the emission from the propulsion engines on the Shell Kulluk and the Jim Kilabuk should be considered and that due to weather/ice related movement, the additional travel for the drilling unit and supply vessel’s engines may be higher than predicted and this factor needs to be taken into account. The commenter believes that the emissions are underestimated and that the emissions associated with the seismic exploration also taking place in the Beaufort Sea concurrently should be considered in combination with the drilling operations, and a cumulative impact analysis should be done. Additionally, one commenter states that Shell’s application fails to meet the EPA regulatory requirement to estimate potential emissions from the OCS Source (the drillships ) at its design capacity.

**EPA RESPONSE**

EPA acknowledges that Shell submitted revised modeling information, including a submission on March 26, 2007. That modeling did not model emissions during maneuvering. However, as discuses in response to comments Category D, Shell’s

modeling included the worst case scenarios. In EPA's technical judgment, this modeling is sufficient to assess the maximum emissions resulting during this project.

EPA's permits authorize oil and gas drilling, but not seismic activity. The seismic vessels are not support vessels for the drillships, and thus are not considered part of the OCS source. Thus, the OCS Air Regulations do not apply and EPA does not regulate seismic related air emissions.

EPA was not provided with any emissions data resulting from seismic exploration activity. Given the transitory nature of the seismic exploration activity, EPA expects minimal impacts to occur even if both activities were to occur at the same place in time.

## **COMMENT**

### Alternate Measure 1

ADEC stated that Shell's pre-construction air permit application to the EPA, Appendix C contains ADEC's Owner Requested Limit Application form. This application form lists "fuel use limitations" and "fuel sulfur content limitation" as attachments included, but there are no attachments included with Appendix C. The application should contain these attachments.

As part of ORL requirements, the stationary source's full PTE must be calculated. To be consistent with Alaska Statutes and Regulations, the applications and permits need to include all emission units, and their associated emissions. The owner or operator's certification of the permit application includes that all emission units were included and used to calculate the stationary source's PTE. The emission units noted must include, but are not limited to crude oil flares, gas flares, crude vents, gas vents or from liquid fuel storage tanks. These items did not appear to be included in the application, therefore the full PTE for all emission units for all pollutants, was possibly not calculated.

## **EPA RESPONSE**

A May 24, 2007 e-mail from Shell states, "There will be no oil or gas flares or crude oil vents, and none are listed in the draft permits." Thus there are no emissions sources that vent directly to the atmosphere that need to be in the emission inventory.

See also EPA's response to comments Category B.

## **COMMENT**

EPA received comment that Shell has not correctly computed the "potential emissions" at the drill site level. Instead, Shell proposes to only operate some of the drillships emission sources some of the time, to avoid triggering major permit status even at a drill site level. The commenter stated that Shell's application fails to meet the EPA regulatory requirement to estimate potential emissions from the OCS Source (the drillships) at its

design capacity. The commenter maintain that EPA requires the applicant to compute the “potential to emit” or PTE.

The commenter further stated that the EPA’s regulation does allow Shell to propose to reduce its air pollution by reducing the number of combustion sources and times they operate. However, it is the commenter’s belief that Shell must first calculate a PTE without operating restrictions and include that information in the permit applications, and as a second step, provide specific information on how it proposes to restrict the OCS source operations. The commenter maintains that Shell has not met this regulatory standard.

## **EPA RESPONSE**

The definition of “potential emissions” as documented at 40 CFR Part 55.2 states,

*Potential emissions mean the maximum emissions of a pollutant from an OCS source operating at its design capacity. Any physical or operational limitation on the capacity of a source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as a limit on the design capacity of the source if the limitation is federally enforceable (emphasis added). Pursuant to section 328 of the Act, emissions from vessels servicing or associated with an OCS source shall be considered direct emissions from such a source while at the source, and while enroute to or from the source when within 25 miles of the source, and shall be included in the “potential to emit” for an OCS source. This definition does not alter or affect the use of this term for any other purposes under §§55.13 or 55.14 of this part, except that vessel emissions must be included in the “potential to emit” as used in §§55.13 and 55.14 of this part. (Emphasis added)*

As evidenced in the applicable definition of “potential emissions,” a source’s potential to emit takes into consideration ORLs. Contrary to the commenter’s assertions, there is no requirement for a source to calculate its PTE without considering emission limitations the applicant is requesting to make federally enforceable. The requirement to calculate PTE as prescribed 18 AAC 50.225(b)(3) has been satisfied as evidenced by information presented in Appendix B of the original applications.

## **Comment E-3: Emission Inventory**

Some comments suggest that there are a number of deficiencies in Shell’s emission inventory. In addition to the sources identified in the PTE comment above, additional specific deficiencies in the emission inventory are noted. The commenter stated that the emission inventory does not include the total emissions over the duration of the proposed

exploration activities, examine the impacts of small particulate matter, or examine particulate emissions at 2.5 microns or less (PM<sub>2.5</sub>). See 30 CFR 250.

### **EPA RESPONSE**

Shell is required to satisfy the requirements of 40 CFR Part 55 in order to receive from EPA authorization to conduct activities on the OCS that generate air pollutant emissions. Whether or not Shell has complied with the requirements of 30 CFR Part 250 is not relevant to EPA's decisionmaking under 40 CFR Part 55. MMS is responsible for the implementation of 30 CFR Part 250.

PM<sub>2.5</sub> emissions have been counted in determining PSD applicability given that PM<sub>2.5</sub> constituents are a part of the particulate matter estimate. Shell was not required to make a PM<sub>2.5</sub> NAAQS demonstration given the applicable minor NSR permitting program only requires a NAAQS demonstration for CO, NO<sub>2</sub>, and SO<sub>2</sub>. The OCS Regulations do not require total emissions over the duration of the project.

### **COMMENT**

EPA received comment that it is not clear if Shell is proposing to conduct well tests to flow back oil or flare gas. Commenters noted that the emission inventory does not address sources of emission that vent directly to the atmosphere. They also asserted that Shell has not included the emissions from a potential relief well, which Shell is proposing to drill to aid in well control, should a blowout occur. In addition, the commenter stated that the time required to drill relief wells varies widely, but may reasonably be assumed to exceed 59 days of drilling time.

### **EPA RESPONSE**

A May 24, 2007 e-mail from Shell states, "There will be no oil or gas flares or crude oil vents, and none are listed in the draft permits." Thus there are no emissions sources that vent directly to the atmosphere that need to be in the emission inventory.

A May 31, 2007 e-mail from Shell states, "Unlike the other projects, Shell will be drilling, evaluating, and plugging the wells. Shell is not planning on producing or production testing the wells. Therefore a blowout or potential relief well are not likely and it is appropriate that the emission inventory does not include any."

### **COMMENT**

A commenter stated that Shell's application requests a minor source permit, based on a maximum of 59 days of operation, but the applicant also states that drilling could continue for 75 days or more per well if ice conditions or unanticipated drilling issues arise.

The commenter noted that Shell has not estimated the PTE for the ice breaker combustion sources, even though heavy ice conditions can reasonably be expected during later September, October, and November in the Beaufort Sea. Shell has estimated air emissions for ice breaker operations based on average ice conditions, yet heavier ice conditions will result in higher engine load factors and higher emissions, which could easily exceed the 250 tpy PSD threshold. It is the commenter's belief that Shell should be required to provide operating records for the Kulluk and Discoverer to verify combustion source usage requirements in previous similar exploration wells, so that the agencies and public can determine if the operating hours and usage restrictions proposed by Shell are realistic and appropriate. The commenter noted the following examples:

- a. Shell estimates the Kulluk will only operate one of the main engines for 24 hours/day for a 60 day period. It assumes that the second engine will only be operated for 23 days, and the third engine will not be operated at all; however, Shell provided no historical operating records to demonstrate that this is a realistic set of operating and equipment usage assumptions for drilling a well in the Arctic, at the depths and conditions Shell is planning.
- b. Shell assumes that the emergency generator is never run at all. All other North Slope facilities air permits are required to assume at least a minimum amount of emergency power use in remote locations. Shell also assumes that only one of the boilers and hot water heaters will be operated for a 60 day period, but assumes the other boiler and hot water heater will not be run at all.
- c. Shell assumes the ice breakers' main engines will operate 6-38 days each. There is not a scrap of justification provided for this assumption, no ice data, and no equivalent historical operating records for similarly situated exploration sites.
- d. Shell assumes that its Oil Spill Response (OSR) fleet main engines will only be run for 36 hours each, which is not realistic. The fleet should be used to practice and train for oil spill response while on standby at the location which will require engine power. The OSR fleet may also be called upon to support oil spill prevention activities, to boom vessels during fuel oil transfers, and to respond to oil spills.

The commenter also stated that Shell's emission estimates for 2007 are inconsistent with the emission estimates for 2008 and 2009. While Shell asserts that its operating hour estimates are realistic for 2007 based on a maximum operating timeframe of 60 days per drill site, it does not provide any rationale whatsoever to support the proposed reduction to 43 days per drill site in 2008 and 2009.

The commenter raised concerns about Shell's ability to use the Tor Viking II in 2008 and 2009. The commenter noted that the Tor Viking II is equipped with some enhanced NO<sub>x</sub> emission control equipment, which barely allows Shell to avoid PSD review at 245 tpy and that the alternative ice breakers (either the Nordica or the Fennica) are not equipped

with enhanced NO<sub>x</sub> emission control equipment. It is the commenter's belief that Shell estimates NO<sub>x</sub> emissions from the Tor Viking II are 21 tons per drill site, whereas either the Nordica or the Fennica emissions are much higher at 83 tons. The commenter concludes by stating that a 62 ton increase in NO<sub>x</sub> emissions makes it impossible for Shell to remain below 250 tons at a single drill site in 2008 and 2009 using the same operating assumptions that are used in 2007.

## **EPA RESPONSE**

EPA recognizes that it is entirely possible that Shell may be unable to complete a hole at every drill site under all circumstances, especially under heavy ice conditions as you suggest. True, it is going to be more difficult for Shell to complete a hole without the lower-emitting Tor Viking II. Shell has requested a minor permit rather than a PSD permit, and the selection of such a path results in the possibility of Shell being unable to complete a hole.

Some commenters argue that EPA should have deemed the application incomplete and requested Shell to provide historical operating records from the Kulluk, Frontier Discoverer (if applicable), and associated icebreakers operating in the Beaufort Sea in the past. With that data, Shell may have been able to construct an emissions inventory based upon ice conditions as they exist during the early to mid 1990's, the last time the Kulluk was deployed to the Beaufort Sea. However, EPA does not believe that the uncertainty surrounding Shell's ability to complete a hole under heavy ice conditions should compel EPA to deny Shell's application. EPA does not believe that the intent of the ORL permitting program was to reject such applications under the circumstances. When the permittee requests that an enforceable emission limit be included in its permit, it recognizes that the ORL may constrain its operations in this instance.

Shell provided to EPA a more detailed estimation of projected fleet activity levels in a March 8, 2007 e-mail. The March 8 document predicts fuel usage on an individual emission unit basis over the course of a drill site under various conditions. The first sheet provided an estimate of "equivalent days" of operation of the various engines. This is not an estimate of the load level, as the engines will be turned on and off as needed. The support vessel sheet gets closer to the load expected per engine. The season average only reflects average load, not actual load. Shell provided additional information with respect to how the icebreakers will be operated based upon limited feedback from the operators of the icebreakers. The information is also available in the administrative record.

EPA's permits limit emissions with adequate monitoring, recordkeeping and reporting so as to verify compliance with the NO<sub>x</sub> cap. In a June 5, 2007 e-mail to EPA, Shell states, "Shell Offshore Inc. will be able to comply with the requested Owner Requested Limits (ORLs) submitted with the application materials for limiting NO<sub>x</sub> emissions from the Kulluk and Frontier Discoverer stationary sources." It is EPA's expectation that Shell will comply with its ORLs.

Monitoring requirements will enable Shell to track its emissions closely, and Shell will know whether it is approaching noncompliance with the NO<sub>x</sub> ORL. The permit requires Shell to record every 15 minutes load levels (surrogate for NO<sub>x</sub>) from the engines constituting approximately 90% or more of the emissions. Although the permit requires Shell to calculate cumulative NO<sub>x</sub> emissions once per week, EPA would expect Shell to deploy a data acquisition and handling system that also computes drill site cumulative emissions at least once per day for those large emission units employing data loggers. Should it become known that completion of the hole is not possible without exceedance of the PSD avoidance limits, it is EPA's expectation that Shell will begin to undertake procedures to safely exit the hole in a manner acceptable to MMS so as to comply with the NO<sub>x</sub> cap.

As Shell states in its February 7, 2007 letter to EPA, "This (NO<sub>x</sub> tracking) equation allows for the tracking of the total NO<sub>x</sub> emission as time progresses and allows Shell to predict if (in the unlikely event) that a drilling program would need to be terminated before completion."

Additionally, Shell has committed to comply with the 250 tpy NO<sub>x</sub> cap and is aware that operations must be suspended when the cap is reached. Condition 7.4 of each permit requires Shell to record NO<sub>x</sub> emissions on a weekly basis.

#### **COMMENT**

Several commenters noted that Shell did not estimate the PTE for all OCS source combustion units, which is inconsistent with the CAA which requires the applicant to first submit a PTE estimate providing a detailed description of all combustion sources operating at full load, 24 hours per day. EPA received comment that the CAA does allow the applicant to propose federally enforceable operating restrictions and emission control obligations to allow the applicant to reduce the total amount of pollution from its operation. One commenter stated that Shell bypassed the PTE requirements and immediately sought to avoid the rigors of a PSD major source permit, by proposing to reduce operating hours on units on an "assemblage of reasonable maximum activity levels."

#### **EPA RESPONSE**

There is no requirement for a source to calculate its PTE without considering emission limitations the applicant is requesting to make federally enforceable. The requirement to calculate PTE as prescribed 18 AAC 50.225(b)(3) has been satisfied as evidenced by information presented in Appendix B of the original applications.

#### **COMMENT**

A commenter stated that Shell's emission inventory for the Kulluk drillships and its associated support vessels of 245 tons NO<sub>x</sub>, barely falls below the PSD threshold for a

major source permit of 250 tons. The commenter concluded that there is little room for error in this emission estimate.

### **EPA RESPONSE**

The reason provided by Shell for the 5 tpy cushion is chronicled in its February 7, 2007 letter to EPA as follows,

The minor source threshold is 250 tpy. With emission factors that are developed from measurement of the actual sources, the calculation of emissions by the compliance equation should be accurate. Recognizing for some imprecision, the (NO<sub>x</sub> tracking) equation limits emissions to 245 tpy, which provides a 5 ton “cushion” below the minor source threshold level.

EPA accepts Shell’s request for a 245 tpy NO<sub>x</sub> ORL.

### **COMMENT**

EPA received comment that a minor source permit is inappropriate for large industrial sources. The commenter noted that Shell’s emission inventory for the Kulluk and the Discoverer drillships s should include a cumulative total of all emissions required to drill the exploration wells planned in a calendar year. They further stated that the total drillships emissions for each ship, on a yearly basis, exceed the PSD threshold for a major source permit of 250 tons by several magnitudes.

### **EPA RESPONSE**

EPA has determined that it is permissible to determine PSD applicability based upon the OCS source’s PTE while operating at a single drill site not within 500 meters of another drill site. Given EPA’s determination, it is not necessary to provide an emissions inventory of cumulative emissions irrespective of proximity.

See EPA response to comments, Category B.

### **COMMENT**

One commenter stated that Shell’s application excludes emissions from the bow thruster diesel engine when it is used to move the supply boat (Jim Kilabuk) next to the drillships s. The commenter concluded that this clearly violates the CAA requirement to include all support vessel emissions in the emission inventory if they are operating within 25 miles of the OCS source.

## **EPA RESPONSE**

Shell's application models the maximum hourly emissions generated by the Jim Kilabuk during the expected worst-case ambient impact scenario. The worst-case ambient impact scenario occurs while the drillships are stationary and drilling.

Jim Kilabuk emissions are counted toward the 245 tpy NO<sub>x</sub> cap as indicated in Conditions 7 and 8 of the permits.

## **COMMENT**

Shell has not properly inventoried nor modeled carbon monoxide emissions for combustion sources that will be operated at low loads, where carbon monoxide emissions will be elevated. Rather, Shell provides very low operating hour estimates, assuming it can run many units at low loads, but illogically does not address the fact that at low loads carbon monoxide emissions will be substantially higher than its estimates.

## **EPA RESPONSE**

Given that the Shell is not proposing to drill within 10 kilometers of a carbon monoxide nonattainment area, the minor NSR 100 tpy CO modeling threshold level does not apply. Shell is not required to model CO emissions in the context of the minor source permit program.

To avoid PSD review, Shell has requested to limit its NO<sub>x</sub> emissions with the understanding that NO<sub>x</sub> is the pollutant that will be emitted in greater quantities than any other pollutant, including CO. Reviewing the emission factors presented in the application, it is clear that NO<sub>x</sub> will be emitted in greater quantities than CO. EPA acknowledges that CO emissions will increase and perhaps overtake NO<sub>x</sub> as you approach near 0% load. However, it is not reasonable to foresee icebreakers or drillships engines operating for any length of time under such an operating condition. NO<sub>x</sub> clearly remains the pollutant for which it is appropriate to limit emissions to avoid PSD, not CO.

## **Comment E-4: Hazardous Air Pollutants**

### **COMMENT**

EPA received comment that Shell's application estimates hazardous air pollutants (HAP) at a drill site level, but not at an OCS source level. In addition to this error, Shell's application does not provide hazardous air pollutant emission estimates for sources vented to atmosphere; Shell only provides estimates for combustion sources.

## **EPA RESPONSE**

Like the NSR program, the NESHAP program also considers proximity in determining the extent of the source. EPA has determined that it is permissible to determine MACT based upon the OCS source's potential to emit while operating at a single drill site not within 500 meters of another drill site. Given EPA's determination, it is not necessary to provide an emissions inventory of cumulative HAP emissions irrespective of proximity.

See also Section 112(n)(4) of the Clean Air Act.

A May 24, 2007 e-mail from Shell states, "There will be no oil or gas flares or crude oil vents, and none are listed in the draft permits." Thus there is no need to include estimates of HAPs vented to the atmosphere.

## **Category F: Ambient Air Quality Standards**

### **Comment F-1: Applicable Offshore Standards**

#### **COMMENT**

What types of rules apply to offshore exploration or development projects?

#### **EPA RESPONSE**

The NAAQS must remain protected on the OCS. For the most part, the same air quality control rules that apply in State waters or onshore apply also within the first 25 miles of the OCS. See 40 CFR Part 55 for more detail. Essentially, emissions generating equipment on the drillships must comply with state and national emission standards. For the most part, a source on the OCS must obtain construction and operating permits as if it were locating onshore or in State waters.

### **Comment F-2: Protection of Ambient Air Quality Standards**

#### **COMMENT**

ADEC suggests that EPA's approval should contain a condition that the owner or operator will not cause or contribute to a violation of an ambient air quality standard or the standards of 18 AAC 50.110 (Air Pollution Prohibited).

#### **EPA RESPONSE**

EPA agrees and has amended the permits to include this condition. See Condition 14 in both permits.

## COMMENT

The NSB comments that Shell's air permit application for its 2007-2009 Exploration Plan does not comply with Section 328(a)(1) because Shell's permit application does not comply with the provisions of the CAA at Title I, Part C, PSD.

Section 328(a)(1) of the CAA requires Shell's OCS exploration operations to attain and maintain Federal and State ambient air quality standards, and to comply with the provisions of the CAA at Title I, Part C, PSD. The CAA at Title I, Part C, PSD was established by Congress to protect the quality of an airshed, like the Beaufort Sea region, from becoming polluted. Congress established certain criteria to prevent "significant deterioration" of these healthy, clean airsheds.

The comment continues to state that at Section 101 of the CAA, Congress found that the growth in the amount and complexity of air pollution brought about by industrial development has resulted in mounting dangers to the public health and welfare, including injury to agricultural crops and livestock, damage to and the deterioration of property, among other adverse affects. In the Arctic, EPA should consider that subsistence resources such as wild herds, and wild plant resources are the equivalent to the term used by EPA to describe domesticated crops and livestock found in the Lower 48 states. Congress established the PSD program to protect and enhance the quality of the nation's air resources to promote the public health and welfare and the productive capacity of its population; to achieve the prevention and control of air pollution, among other goals. Furthermore the CAA at Title I, Part C, states that a primary goal of the act is pollution prevention:

*"A primary goal of this Act is to encourage or otherwise promote reasonable Federal, State, and local governmental actions, consistent with the provisions of this chapter, for pollution prevention."* 42 USC 7401(c).

Shell's applications, by evading the rigors of the PSD review process, does not ensure pollution is prevented and human health, food sources, and the environment are adequately protected.

Shell proposes to avoid PSD review by applying for a minor air permit to be issued at each drill site. Shell incorrectly asserts that an OCS source is defined by drill site. This is incorrect, because the CAA defines the OCS source as the drillships itself not the drill site.

By proposing to permit each individual drill site, rather than the drillships or the collective Exploration Plan, Shell seeks to avoid Best Available Control Technology (BACT) review required for major sources of air pollution.

By avoiding a major source review, Shell achieves a cost and application time savings. Shell's proposal seeks to avoid baseline data collection, comprehensive site-specific air

pollution modeling, best available technology review, among other standards that apply to a major source of air pollution, and not to a minor one.

Furthermore, Congress also required under Section 328(a)(1) of the CAA that OCS air emission sources located within 25 miles of the State of Alaska seaward boundary meet federal and state air pollution control and permitting requirements. Therefore, this letter is addressed to the State of Alaska to ensure that all state requirements are also met for this OCS source.

## **EPA RESPONSE**

The applicable minor NSR permit program requires Shell to demonstrate its emissions will not cause or contribute to a violation of the NO<sub>2</sub>, PM<sub>10</sub>, or SO<sub>2</sub> ambient air quality standards. Shell has made such a demonstration. Shell is not required to demonstrate that increment will be protected given that its PSD review has not been triggered.

## **Category G: Outer Continental Shelf Definition**

### **Comment G-1: Outer Continental Shelf Source Definition**

#### **COMMENT**

We are also concerned that “Prior to the rig placement and anchoring to the seabed in OCS waters, the Frontier Discoverer is simply a self-propelled marine vessel and as such is not triggering the definition of an OCS source” (Shell Application, Frontier Discoverer, p. 9). Therefore, the air pollution from the Kulluk and Frontier Discoverer drilling rigs, as well as all their associated vessels are being ignored in the determination of total emissions and therefore they have stayed below the PSD source threshold.

#### **EPA RESPONSE**

The commenter is misquoting and misinterpreting EPA’s methodology for counting emissions to determine major source applicability on the OCS. The entire paragraph from EPA’s Statement of Basis in support of the Frontier Discoverer permit referenced by the commenter states:

The Discoverer and its support vessels are subject to the OCS regulations only when the Discoverer is attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom. This means that the OCS regulations do not apply while the Discoverer is in transit (it remains inherently a vessel), except when the Discoverer or any support vessel is in transit within 25 miles of the drill site. Emissions from the Discoverer and support vessels within a 25-mile radius of the drill site are considered in determining the Discoverer’s potential to emit (PTE) as if the Discoverer were already located at the drill site. In that sense, it is the above activity at an OCS drill site that EPA is permitting and not the Discoverer wherever it goes. It is with this interpretation

of the OCS regulations and the definition of OCS source that EPA assesses NSR applicability. (emphasis added)

Contrary to what the commenter states, air pollution from the Kulluk and Frontier Discoverer drilling rigs, as well as all their associated vessels are NOT being ignored in the determination of total emissions as evidenced by Condition 7 of the Kulluk permit which states:

**Owner Requested Limits Rendering Prevention of Significant Deterioration (PSD) Review Unnecessary**

**7 Nitrogen Oxides (NO<sub>x</sub>) Emission Limitation.** The permittee shall not allow the sum of emissions from the Frontier Discoverer and from support vessels operating at or within 25 miles of the drill site to exceed 245.0 tons of NO<sub>x</sub> within any Rolling 52-week period while mobilizing, operating, and demobilizing the Frontier Discoverer within 25 miles of a drill site.

7.1 Emissions generated by the Frontier Discoverer and its support vessels shall be aggregated across multiple Frontier Discoverer drill sites only to the extent that:

a. The emissions were generated within the same 52-week period, and

b. The drill sites are located within 500 meters of one another.

(i) The perimeter of each Frontier Discoverer drill site is the hull of the Frontier Discoverer.

7.2 Emissions generated by the Frontier Discoverer and its support vessels shall be aggregated with emissions from another OCS source owned or operated by permittee and its support vessels only to the extent that:

a. The emissions were generated within the same 52-week period, and

b. The drill sites are located within 500 meters of one another.

(i) The perimeter of each Frontier Discoverer drill site is the hull of the Frontier Discoverer, and the perimeter of each OCS source drill site is the hull of the OCS source.

7.3 When the Frontier Discoverer and its support vessels are in transit to or from another drill site less than 25 miles away, attribute the emissions as follows:

a. Half of the transit emissions shall be attributed to one of the two drill sites, and

b. The other half of the transit emissions shall be attributed to the other drill site.

The Kulluk permit contains similar language.

While the drillships are in transit, the OCS Air Regulations do not apply to the emissions units on the drillships that would otherwise be subject to regulation under those rules while the drillships is anchored to the sea floor. As EPA stated in its proposed OCS rulemaking, “EPA is proposing not to regulate vessels as “OCS sources,” and any regulations adopted by state and local agencies to directly control vessel emissions will not be incorporated into part 55 because it would exceed EPA’s authority under section 328.<sup>5</sup>” EPA’s final rulemaking remained consistent with the statement quoted above as evidenced by the definition of OCS source at 40 CFR 55.2. An OCS source “shall include vessels only when they are permanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom.”

To determine the “potential emissions” of an OCS source, however, EPA does count drillships and associated vessel emissions while in transit within 25 miles of a drill site. Shell acknowledged this authority in that it estimated vessel emissions to demonstrate its capability of complying with a ORL that enabled Shell to avoid PSD review. See Appendix B of the applications for the actual calculations.

## COMMENT

### The OCS Source Definition has been Wrongly Applied

Shell’s air permit application for its 2007-2009 Exploration Plan does not comply with Section 328(a)(4)(C) of the CAA, because Shell proposes to define an OCS source as a single drill site, whereas the CAA defines an OCS source as the drillships itself. The drillships is the OCS source, including the support vessels for the drillships within 25 miles of the exploration site.

Nothing in Section 328(a)(4)(C) of the CAA defines an OCS source as a single exploration well site. The law is clear that the OCS source is the drillships itself not the drill site:

*“...any equipment, activity, or facility which- (i) emits or has the potential to emit any air pollutant, (ii) is regulated or authorized under the Outer Continental Shelf Lands Act, and (iii) is located on the Outer Continental Shelf or in or on waters above the Outer Continental Shelf. Such activities include, but are not limited to, platform and drillships exploration, construction, development, production, processing, and transportation. For purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or enroute to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.” (Emphasis added.)*

---

<sup>5</sup> 56 Fed. Reg. 63774, 63777 (Dec. 5, 1991).

Attempting to define an OCS source as a single drill site, clearly contradicts the statute.

## **EPA RESPONSE**

EPA agrees with the commenter in that the OCS source is the drillships and its associated vessels.

The issue of what is the OCS source is distinct from determining whether emissions should be aggregated across multiple drill sites in determining NSR applicability. However EPA is not replacing the term “stationary source” with the term “OCS source” in the context of administering the OCS Air Regulations’ NSR permitting program. The fundamental NSR concept of a “Building, structure, facility or installation” is relevant on the OCS and therefore differentiation between drill sites is considered. As commenter points out, the definition of OCS source includes emissions from vessels associated with an OCS source including emissions while at the OCS source or enroute to and from the OCS source within 25 miles of it. These emissions are then calculated to determine PTE for applicability purposes, but the OCS source remains the drillships itself.

## **COMMENT**

### EPA Regulations Define the OCS Source as the Vessel, Not the Drill Site

40 CFR 55.2 defines an OCS source as any equipment, activity, or facility which (1) emits or has the potential to emit any air pollutant, (2) is regulated or authorized under the OCS Lands Act, and (3) is located on the OCS or in or on waters above the OCS. **Vessels** are included in this definition when they are permanently or temporarily attached to the seabed during exploration. The regulations clearly define the OCS source as the drillships, not the drill site. It is the vessel that is included in the definition. The **vessel** is subject to the OCS source definition. Nothing in 40 CFR 55.2 speaks to a drill site as being a relevant factor in defining an OCS source.

Based on the CAA at Section 328(a)(4)(C) the OCS source is the drillships :

*“...any equipment, activity, or facility which- (i) emits or has the potential to emit any air pollutant, (ii) is regulated or authorized under the Outer Continental Shelf Lands Act, and (iii) is located on the Outer Continental Shelf or in or on waters above the Outer Continental Shelf. Such activities include, but are not limited to, platform and drillships exploration, construction, development, production, processing, and transportation. For purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or enroute to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.”(Emphasis added.)*

EPA’s regulations require OCS drillships to compute their potential to emit air pollution from the drillships, itself, and all its support vessels within 25 miles when the vessel is actively conducting exploration drilling.

## **EPA RESPONSE**

EPA agrees that the OCS source is the drillships , and that one counts support vessel emissions to determine NSR applicability. The commenter’s statement “EPA’s regulations require OCS drillships s to compute their potential to emit air pollution from the drillships , itself, and all its support vessels within 25 miles when the vessel is actively conducting exploration drilling” is nearly complete. The statement, however, is not appropriately qualified to take into consideration the NSR regulations within which the extent of the source is determined.

Although it is clear that Section 328 of the Act and 40 CFR Part 55 require that support vessel emissions within 25 miles of a drillships be aggregated with the drillships emissions, neither the statute nor the implementing regulation specifically discuss how or whether to aggregate emissions occurring across multiple drill sites. Furthermore the OCS Air Regulations do not regulate any vessel emissions (including those of the drillships ) while the vessels are in transit from one drill site to the next. In this absence of clear direction, EPA turns to the NSR regulations within Part 55 to help define a “common sense notion of plant.” EPA has determined that in this instance it is a reasonable interpretation to consider each drill site (or surface site) separately. In making this determination EPA considered traditional NSR permitting concepts and EPA guidance and took into account factors such as consideration of ownership, proximity and industrial grouping. EPA determined that the OCS source is the drillships and that for purposes of determining PTE, the emissions from drill site to drill site along with associated emissions are calculated separately.

## **Category H: Geographic Scope**

### **Comment H-1: Scope of the Project**

#### **COMMENT**

EPA received comment that EPA’s proposal gives Shell an overly broad authorization to operate on all Shell lease blocks, rather than to specific drilling sites, notwithstanding the differences in air quality and other resources between these sites.

Commenters state that the Geographic Scope is too broad. They maintain that EPA’s Draft permits for Kulluk and Frontier Discoverer do not provide site specific approval but are in effect a general permit, as they give this as the location on the approval page: “Any drill site within a Beaufort Sea OCS lease block authorized by the Minerals Management Service within 25 miles of the State of Alaska’s seaward boundary.”

We are concerned that with EPA’s vague permit, not only could this permit cover drilling activities on any existing Shell lease block in the Beaufort Sea, but also on future leased areas that have not had adequate environmental impact analysis.

## **EPA RESPONSE**

As stated on the first page of the permit, Shell can utilize this permit at “Any drill site within a Beaufort Sea OCS lease block authorized by the MMS within 25 miles of the State of Alaska’s seaward boundary.” This permit may be utilized to conduct exploration activity at a current or future Shell lease holding. Shell, however, will be unable to drill at any of its lease holdings without first getting proper authorizations from MMS. EPA is confident that MMS will maintain its appreciation for the distribution of resources across different parts of the OCS in all its decisionmaking.

Given the use of worst-case meteorology to determine Shell’s ambient impacts, and given EPA’s understanding that air quality is fairly uniform across the Beaufort Sea, EPA is confident that Shell’s exploration activities will not cause or contribute to a NAAQS violation across any MMS lease blocks in the Beaufort Sea. The resultant permits may be utilized across the Beaufort Sea.

## **Category I: Permit Duration**

### **Comment I-1: Lack of Permit Duration**

#### **COMMENT**

NAEC commented that the indefinite permit period is unreasonable, unsupported by evidence that there would not be direct or cumulative degradation of air quality, and does not meet the intent nor requirements of the CAA. There is not sufficient information about the nature of the operations nor environmental impact for one-year of operations, much less multiple years. It appears possible for one or both rigs and their supporting vessels, ice-breakers, etc. to stay in one place for repeated years. Therefore, we are very concerned that a long-term major air pollution source may be introduced to the pristine Beaufort Sea waters through an incremental, piecemeal process.

Commenter explains further that Shell Oil has presented vague and contradictory information about the duration of its planned exploration program that affect the amount of air pollution resulting from this project. Shell’s Frontier Discoverer Air quality permit application (December 26, 2006, p.1) says Shell “intends to conduct a three-year exploratory drilling program, 2007 through 2009, although drilling activity may occur in 2010 and 2011 if ice conditions prevent significant exploratory drilling activity in 2007, 2008, or 2009.” Therefore, the public must assume that this may be a 5-plus year drilling program. The MMS Exploration plan Environmental Assessment evaluated the effects only for the period 2007-2009. EPA should require that the application include specific sites and times when the rigs will be operating in the Beaufort Sea. The commenter asks that Shell’s request be denied. If issued, EPA’s final Kulluk and Frontier Discoverer permits should contain a discrete permit term (the draft permits do not).

The NSB also expressed concern with the permit duration stating that the scope of Shell's air permit approval and application is not clear. Site-specific data is missing for most years, and it is unclear if Shell is requesting a three (3) or five (5) year permit. Shell's applications to MMS, ADEC, and ADNR all state that Shell plans to conduct a three (3)-year drilling program. Shell's application to the EPA states that it may continue drilling for five (5) years. The NSB wondered if Shell was requesting a three year permit approval to construct or a five year approval. Shell's application to all agencies provides some site-specific detail on 2007 operations, but no site specific detail for 2008, 2009, or 2010-2011 (assuming Shell is seeking a five year air permit to construct from the EPA). Shell's applications state that it expects drilling to last for 45 days per well for deeper wells, but under "ideal ice conditions and unanticipated drilling issues the drilling program could possibly continue for up to 75 days." Shell simply does not address the additional time required when "non-ideal" ice conditions are encountered, which could add up to 75 days. The commenters assert that the scope of Shell's air permit approval and application is not clear. Site-specific data is missing for most years, and it is unclear if Shell is requesting a three (3) or five (5) year permit. Shell's application to all agencies provides some site-specific detail on 2007 operations, but no site specific detail for 2008, 2009, or 2010-2011 (assuming Shell is seeking a five year air permit to construct from the EPA).

## **EPA RESPONSE**

On March 29, 2007, Shell requested that the permits be issued with an unlimited duration. Based on this request, EPA is issuing minor permits to Shell that does not have expiration dates. This approach is consistent with the underlying regulation, 18 AAC 50.542(g), which states, "A minor permit issued under this section remain in effect until changed by another Title I permit or by an action by the (EPA) under AS 46.14.280..."

Pursuant to AS 46.14.280:

(a) After 30 days' written notice to the permittee, the department

(1) may terminate, modify, or revoke and reissue a construction or operating, or minor permit if the department finds that

(A) the permit was obtained by misrepresentation of material fact or by failure of the owner and operator to disclose fully the facts relating to issuance of the permit;

(B) the permittee has violated this chapter, a regulation, a judicial or administrative order, or a material term or condition of a permit, approval, or acceptance issued under this chapter; or

(C) the permittee has failed to construct or modify a stationary source within the time period specified in a construction permit, if any, required under AS 46.14.130 (a);

(2) may modify, or revoke and reissue a construction, operating, or minor permit if the department finds that

(A) the permit contains a material mistake; or

(B) there has been a material change in the quantity or type of air pollutant emitted from the stationary source; or

(3) shall reopen a permit issued under this chapter

(A) based on a determination of the federal administrator or the department that the permit must be revised to comply with 42 U.S.C. 7401-7671q (Clean Air Act) and regulations adopted thereunder; or

(B) to incorporate changes in law, or to impose equivalent emission limitations, that become applicable after the permit is issued if the permit is issued to a major stationary source and has a remaining duration of three or more years; the department shall make revisions allowed under this subparagraph as soon as practicable, but, regarding a change in law, no later than 18 months after the change in law takes effect; the department may not reopen the permit of a major stationary source under this subparagraph if the change in law is not effective until after the date that the permit expires.

(b) Reopening of a permit under (a)(3) of this section shall be treated as a permit renewal by the department if the procedural requirements for permit renewal have been met.

(c) Proceedings to reopen a permit under this section shall follow the same procedure as for initial permit issuance and shall affect only those parts of the permit for which the department had cause to reopen under this section.

Pursuant to Condition 17 of the permits, and consistent with 40 CFR Part 55.6(b)(4), the permit will become invalid if construction of the exploratory drilling activity is not commenced within 18 months after the effective date of this permit, or if construction of the activity is discontinued for a period of 18 months, unless EPA extends the 18-month period upon a satisfactory showing that an extension is justified, pursuant to 40 CFR 55.6(b)(4).

The 18-month time periods noted in Permit Condition 17 do not refer to time periods between drillships deployments to the Beaufort Sea. Once a drillships has been deployed to the Beaufort Sea and is operating as authorized by EPA, the source is considered constructed and operating.

## **Category J: Major Source General Comment**

### **Comment J-1: Project Should be Permitted as a Major Source**

#### **COMMENT**

Some commenters contend the project should be permitted as a major source rather than as minor sources. Specifically, the NSB comments that Shell's application does not conform to federal and state requirements, as described above; nor does it conform to previous permitting of the Kulluk drillships and questions permitting the Kulluk drillships as a minor source when EPA previously determined the Kulluk to be a major source when it was operated by ARCO. The NSB notes that ARCO was required to complete a comprehensive major source air permit application, ambient air quality modeling assessment, BACT evaluation and human health impact assessment. The NSB also asserts that Shell's drillships have the potential to emit air pollution above the PSD threshold while operating in the Beaufort Sea during the 2007-2009 Exploration Plan. The drillships are major sources of OCS air pollution, requiring major NSR under the CAA.

#### **EPA RESPONSE**

On December 14, 1993, EPA issued a PSD permit to ARCO to construct and operate the Kulluk in the Beaufort Sea. The permit was founded upon a February 1993 application within which ARCO estimated NO<sub>x</sub> emissions of 2,311.9 tons over a 4-month period from mid-July to mid-November. Given that one might expect to drill perhaps three holes over a 4-month period, ARCO was essentially predicting NO<sub>x</sub> emissions of 578 tons per drill site. Shell, on the other hand, is committing to generate less than 245 tons of NO<sub>x</sub> per drill site.

EPA could find nothing in the 1993 permitting record documenting an EPA position requiring that emissions across separate drill sites be aggregated for the purpose of determining PSD applicability. While EPA may have instructed ARCO to calculate the Kulluk's emissions across a four-month drilling season to determine PSD applicability in 1993, EPA does not believe such a decision is precedent setting.

Applicability determinations are achieved on a case-by-case basis. As explained in EPA's response to the next comment, EPA's determination to recognize Shell's Beaufort Sea exploration activity as a series of minor sources is based on Shell's specific operation parameters and commitment and is permissible under the OCS Air Regulations and Section 328 of the CAA.

## COMMENT

EPA received comment that a drillships and its support vessels are subject to the OCS regulations only when the drillships is attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom. The commenter maintains that this means that the OCS regulations do not apply while the drillships is in transit (it remains inherently a vessel), except when the drillships or any support vessel is in transit within 25 miles of the drill site. The commenter further states that emissions from the drillships and support vessels within a 25-mile radius of the drill site are considered in determining the drillships 's PTE as if the drillships were already located at the drill site. In that sense, it is the above activity at an OCS drill site that EPA is permitting, and not the drillships wherever it goes. It is with this interpretation of the OCS regulations and the definition of OCS source that EPA assesses NSR applicability.

## EPA RESPONSE

The following discussion provides the rationale for generally not aggregating emissions across separate drill sites. However, EPA determined that it is reasonable in this case to accept Shell's ORL to aggregate emissions across separate drill sites located within 500 meters of one another.

As we stated previously in EPA response to public comment Category G

*The issue of what is the OCS source is distinct from determining whether emissions should be aggregated across multiple drill sites in determining NSR applicability. EPA is not wholly replacing the term "stationary source" with the term "OCS source" in the context of administering the OCS Air Regulations' NSR permitting program. The fundamental NSR concept of a "Building, structure, facility or installation" is applicable on the OCS.*

Pursuant to AS 46.14.990 and 18 AAC 50.040(h)(4)(B)(iii) of the State of Alaska Requirements Applicable to OCS Sources, December 3, 2005,

- (4) "building, structure, facility, or installation" has the meaning given in 40 C.F.R. 51.166(b) except that it includes a vessel
- (A) that is anchored or otherwise permanently or temporarily stationed within a locale;
  - (B) upon which a stationary source or stationary sources are located; not including stationary sources engaged in propulsion of the vessel; and
  - (C) that is used for an industrial process, excluding a tank vessel in the trade of transporting cargo; in this subparagraph, "industrial process" means the extraction of raw material or the physical or chemical transformation of raw material in either composition or character;

40 CFR 51.166(b)(6) states:

*(6) Building, structure, facility, or installation means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same Major Group (i.e., which have the same two-digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement (U.S. Government Printing Office stock numbers 4101-0066 and 003-005-00176-0, respectively).*

One can distill the above regulatory text down into a set of criteria for determining what activities together constitute a source. The three criteria are as follows:

- (1) a common owner or operator,
- (2) the same SIC code, and
- (3) the same contiguous or adjacent property.

Shell intends to conduct exploration activity at multiple drills sites with the Kulluk and Frontier Discoverer drillships s. Each drillships will be assisted by a fleet of support vessels. The two drillships s will have the opportunity to operate simultaneously on lease blocks currently held by Shell. All of this exploration activity is being undertaken by the same owner or operator, and the activity is classified under the same 2-digit SIC code; SIC Major Group 13 for Oil and Gas Extraction. What needs to be determined is whether the activity authorized by an OCS permit is being conducted on contiguous or adjacent properties.

Support vessels are not generally authorized by an OCS permit given that support vessels are not a part of the OCS source.<sup>6</sup> By statute, however, its emissions are considered in determining the PTE and accompanying NSR applicability for the source. But for this specific statutory language, we would not consider mobile source emissions where the vessel is beyond 25 miles in determining NSR applicability..

To determine whether the third criteria was met, EPA considered the fact specific operations scenario presented here. EPA specifically recognizes that Shell's activities over the course of a 52-week period may be located on contiguous lease blocks. A single lease block, however, covers some 5,760 acres of open water accessible by the public. A drillships , on the other hand, occupies perhaps a few of these acres at a single time. The emissions generating activity occurs within a very, very small fraction of the entire area

---

<sup>6</sup> Given that Shell is requesting an ORL that necessarily includes support vessels emissions; the resultant permits include monitoring, recordkeeping, and reporting conditions directly applicable to support vessel activities.

controlled by Shell. A “common sense notion of plant” does not support aggregating emissions across vast swaths of area upon which no emissions generating activity occurs. Even if two drillships should be operating within the same lease block, the ships could still be separated by a number of miles. In any case, at no time do two drillships share a physical connection, and at no time is one drillship dependent upon the support of another drillship. Their operations are independent in that sense. So too is a single drillship’s operation independent from one site to the next. EPA determined that it is not reasonable (or perhaps even feasible) to anticipate that a drillship would begin to drill a well or wells from one drill site, extract itself from the site, re-position itself at another nearby location, and then begin again to drill the unfinished well or wells to completion.

Thus EPA reasonably determined that activities undertaken at the same drill site are contiguous, and therefore the activities together constitute a source while operating together at that one location. For exploration activities undertaken at different drill sites, however, the determination is less clear. In this case, EPA has determined that activities undertaken across different drill sites are most likely never contiguous nor adjacent given that the resultant source would not fall within a “common sense notion of plant.”

To accommodate local airshed concerns, Shell requested EPA to aggregate emissions occurring within the same 52-week period and generated by equipment located at separate well sites but within 500 miles of one another. Beyond this distance, a drillship is not anticipated to have an impact greater than EPA’s significance levels. Based on consideration of allowable air emissions operational scenarios and other factors EPA determined this approach is reasonable.

Rather than issuing a separate permit to Shell for every drill site that it may explore utilizing the equipment described in its application, EPA is issuing two separate permits (one for each drillship) so as to minimize the administrative burden associated with issuing multiple permits. Each resultant permit for OCS operations at a drill site in a Shell Beaufort Sea lease block captures all applicable requirements regardless of the exact location of the actual drill site.

## **COMMENT**

The NSB comments that Alaska regulations, 18 AAC 50.990(55), define a marine vessel as a ship. Shell is proposing to bring a fleet of vessels, including a drillship to the Beaufort Sea for the purposes of oil and gas exploration. The drillship is a marine vessel that explores for oil and gas, it is not the same as land based oil and gas exploration rigs used on the North Slope mounted on wheels and driven from one well site to another.

The NSB maintains that Alaska state regulations at 18 AAC 50.990(124) define a portable oil and gas operation as an operation that moves from site to site to drill or test

one or more oil or gas wells, and that uses drill rigs, equipment associated with drill rigs and drill operations, well test flares, equipment associated with well test flares, camps, or equipment associated with camps. The basis for this definition and regulations for portable oil and gas operations was to permit land based drilling rigs (oil and gas drilling rigs mounted on wheels) to be driven from one well site to another on the North Slope. In the commenter's view, nothing in the background for developing the portable oil and gas operations contemplated applying these regulations to drillships or major OCS sources of air pollution. (see 18 AAC 50 Rulemaking History and revised State Implementation Plan).

The commenter argues that Alaska's rules, specifically developed to address land-based drilling rigs, should not be applied to OCS drillships. OCS drillships have different combustion equipment and air pollution sources than a land-based drilling rig. The number and type of engines are different, and land based drilling rigs are not supported by a fleet of ice breakers and support vessels which add a substantial amount of pollution to the drilling process. Such an interpretation would contravene federal and state law, and the federal OCS regulations at 40 CFR 55, and would arbitrarily and capriciously attempt to apply land based drilling rig rules to an OCS exploration drillships equipped with multiple support vessel emission sources. Application of portable land based drilling rig rules to OCS drillships is illogical, and clearly was never contemplated in the regulatory record or by the technical support documents for these regulations.

EPA's public notice states that Alaska Regulations at 18 AAC 50.502(c)(2) require OCS sources to obtain a minor permit from the EPA before commencing operation. Nothing in 18 AAC 50.502(c)(2) addresses an OCS drillships or specifically states that an OCS drillships is required to obtain a minor source permit.

## **EPA RESPONSE**

EPA continues to believe that OCS drillships may be considered "portable oil and gas operations" in the context of the OCS Air Requirements Applicable to OCS Sources. EPA's position was recently confirmed by the Alaska Department of Environmental Conservation in a May 30, 2007 letter to NSB stating,

*the term "portable oil and gas operations" include OCS drillships since they are not noted as exclusion. The EPA appears to share ADEC's viewpoint since they cited 18 AAC 50.502(c)(2) which discusses the requirement for portable oil and gas operations in their public notice.*

Classifying OCS drillships as "portable oil and gas operations" results in more stringent (not less stringent) regulation.<sup>7</sup> In the absence of an affirmative classification, Shell would still trigger the requirement to obtain a minor permit, but only for its NO<sub>x</sub> emissions. It is not certain that Shell would still trigger review for any other pollutant

---

<sup>7</sup> The Minor General Permit MG1 Oil or Gas Drilling Rigs does not apply on the OCS.

given that applicability is base upon emissions, not industry classification. EPA's decision to classify Shell's operations as "portable oil and gas operations" results in a more stringent review, not less stringent.

#### **COMMENT**

The lack of site specific monitoring and meteorology data requires state and federal agencies to use conservative assumptions in permitting this project to ensure human health and the environment are protected; however, conservative assumptions have not been used introducing risk and concern. A conservative and regulatory sound approach would be to permit this project as a major source of air pollution, adhering to the rigors of the CAA.

#### **EPA RESPONSE**

Our authority to issue PSD permits extends only to major stationary sources. Shell is not applying to construct and operate a major stationary source. Nonetheless, the minor permit program EPA is implementing assures protection of the NAAQS.

#### **COMMENT**

EPA received comment that the recent trend in applications seeking PSD avoidance permits by proposing to disaggregate their sources has created this air quality problem, because operators have been allowed to divide up their facilities into smaller and smaller units. As a result, they stay below the threshold for pollution control requirements established in the CAA and avoid the rigors and requirements of PSD, National Emission Standards for Hazardous Air Pollutants, and New Source Performance Standards.

Several commenters stated that avoiding major source review under the PSD program undermines the goals and intent of the CAA and may result in public health consequences.

#### **EPA RESPONSE**

EPA is not aware of an existing air quality problem that needs to be addressed in this instance. Rather, the ambient air on the North Slope of Alaska is achieving the NAAQS. Shell has demonstrated that its emissions will not cause or contribute to an exceedance of the NAAQS for NO<sub>2</sub>, PM<sub>10</sub>, and SO<sub>2</sub> at the edge of the drillships out on the OCS at least 3 miles offshore. The approach taken here fully satisfies applicable CAA requirements.

See EPA response to comments, Category K

## **Category K: Aggregation of Sources**

### **Comment K-1: Aggregation Memo**

#### **COMMENT**

The NSB has reviewed the January 12, 2007, EPA Guidance Memo referenced by Shell in the air permit applications. It is the NSB's belief that this memo is not applicable to Shell's proposed operation.

The NSB states that the memo starts by directing air permitting authorities to begin their analysis by evaluating whether each individual surface site qualified as a separate stationary source. It is the NSB's position that in Shell's case, each individual surface site does not qualify as a separate source, because the OCS source is the drillships .

The NSB believes that EPA's memo reinforces the requirement to aggregate industrial activities according to proximity and ownership, which indicates that each Shell OCS source (Kulluk drillships and Discoverer drillships ) should be aggregated into one single permit since both ships are required to complete Shell's 2007-2009 Exploration Plan, will be operated by Shell and will be drilling exploration wells close to each other.

The NSB maintains that EPA confirmed major source determination for oil and gas operations must (1) reasonably carry out the purposes of PSD, (2) approximate a common sense notion of a plant, and (3) avoid aggregating pollutant-emitting activities that as a group would not fit in the ordinary meaning of building, structure, facility, or installation. As a result: Shell should revise its air permit applications to include all of the drillships emissions (and associated support vessels and equipment) into a single major source permit application to reasonably carry out the purposes of PSD, and ensure best available pollution control equipment is installed when operating in the Beaufort Sea. A drill site does not approximate a common sense notion of a plant. A plant is the combustion source, which is the drillships . A drill site itself is not a "plant," it is a location. The emissions from a drillships fit in the ordinary meaning of structure, facility, or installation. A drill site does not. A drill site is a location on a lease. A drill site is not a structure, it is not a facility, it is not an installation.

The NSB believes that EPA's memo points out that the definition of a major source under Section 112 of the CAA for the Air Toxic Program limits the aggregation of oil exploration well equipment with other wells. However, as EPA points out, Section 112 of the CAA does not apply to OCS sources for the purposes of making a major source decision under the PSD Construction Permit Program or Title V Operating Permit program. And, while Shell uses the Section 112 argument to defend its permit application, it is not a relevant legal position. Nothing in the EPA memo suggests that a single PSD or Title V air permit should be issued for each OCS drill site.

#### **Rulemaking Required**

The NSB also asserts that because the January 12, 2007 memo was not adopted through rulemaking procedures and contradicts the statute, it is arbitrary and not entitled to deference.

### **EPA RESPONSE**

Contrary to commenters claim, EPA is not relying on the January 12, 2007 EPA Guidance Memo to support our decisionmaking here. Rather, based on a review of the permit application and case specifics, the approach used in this permitting action is reasonable and consistent with CAA requirements. Furthermore, the January 12, 2007 EPA Guidance Memo does not constitute final agency action and is not subject to rulemaking procedures.

### **COMMENT**

Commenters stated that Shell Exploration program requires major source review. Shell has intentionally segmented its operations into getting permits for the two drilling rigs separately even though they are part of the same exploration program in order to remain below the major source threshold of 250 tpy (see Shell's March 26, 2007 Addendum to preconstruction permit applications, Item 5. and other documents submitted to EPA).

In addition to separating the Kulluk from the Frontier Discoverer, Shell has also segmented each of three drilling sites as a separate source in order to stay below the 250 ton-per year major source review requirements. In its request to EPA, Shell proposes drilling up to three wells per drill rig (Kulluk and Frontier Discoverer) per year, contrasted with two exploratory wells drilled per rig year discussed by the Minerals Management Service (EA, p. 2).

### **EPA RESPONSE**

See EPA response to comments Category J-1.

### **COMMENT**

A commenter maintains that EPA has allowed Shell to improperly segment a single exploration plan such that the impacts of the separate drillships are considered separately rather than cumulatively. Similarly, EPA has largely discounted the impacts from the numerous support ships that will be operating in conjunction with the drillships, even though the ice-breakers contribute 70-80% of vessel fleet air emissions. The commenter believes that if looked at in total, it would be clear that Shell's proposed operations constitute a major rather than minor source and could not be approved under the current procedure.

### **EPA RESPONSE**

The characterization of Shell's exploration activities in the context of MMS regulations does not directly correspond to classification in the context of EPA regulations. Each set of regulations is developed based upon different statutes.

EPA is not discounting support vessel emissions. Support vessel emissions continue to be aggregated with drillships' emission when located within 25 miles of the drill site. Emissions associated with activities at one drill site are not, however, aggregated with activities at another drill site more than 500 meters away.

#### **COMMENT**

The NSB argues that Shell's OCS operations must meet major source determination. It is the NSB's belief that Shell's air permit application, for its 2007-2009 Exploration Plan, does not comply with Sections 302 and 501 of the CAA because Shell proposes to define its Exploration Plan as a series of concurrently operating "minor sources" of air pollution rather than a single group of stationary sources located within a contiguous area and under common control.

The NSB further states that under Section 302 and 501 of the CAA, a major source of air pollution means: "...any stationary source (or any group of stationary sources located within a contiguous area and under common control).... "major stationary source" and "major emitting facility" mean any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tpy or more of any air pollutant."

#### **EPA RESPONSE**

The characterization of Shell's activities in the context of an Exploration Plan developed pursuant to MMS regulations does not correlate to classification of the activities in the context of EPA regulations. Each set of regulations is developed based upon different statutes. Just because Shell submitted one Exploration Plan to MMS for approval doesn't mean that Shell must submit one air permit application to EPA.

#### **COMMENT**

A commenter stated that compliance with the Title V permit program is required. The commenter further states that Section 504(e) of the CAA allows the EPA to issue a single Title V operating permit to an OCS Source authorizing emissions from similar operations at multiple temporary locations. The Title V Operating Permit must be issued to the OCS Source, which is the drillships. Nothing in Section 504(e) of the CAA specifies a Title V operating permit should be issued for a single drill site. Furthermore, the NSB believes that nothing in Section 504(e) supports Shell's proposal to permit each drill site as a separate OCS Source to avoid major source classification.

#### **EPA RESPONSE**

The applications Shell has submitted are construction permit applications, not Title V operating permit applications. The resultant minor permits are not intended to specify whether or not the source is subject to Title V.

The OCS Air Regulations allow the agency to issue a single Title V permit for a major temporary source's activities occurring across multiple locations. See 40 CFR 71.6(e). This provision is meant to relieve the administrative burden of Title V compliance for a major source. This provision, however, does not specify how to calculate a temporary source's PTE so as to determine its Title V applicability. This provision does not in any way influence the determination of the "major source" as defined at 40 CFR 71.2.

## **COMMENT**

The NSB submitted comment that PSD of the Beaufort Sea Air Shed Must be Achieved. It is the NSB's belief that 40 CFR 55.13 requires OCS sources to comply with EPA's PSD regulations at 40 CFR 52.21 for major stationary sources of air pollution. At 40 CFR 52.21(b)(5) a stationary source is defined as a structure or installation, among other things that meets three criteria:

- (1) Belongs to the same industrial grouping (the same Standard Industrial Classification (SIC) Code);
- (2) Is located on one or more contiguous or adjacent properties; and
- (3) Is under the control of the same person.

Shell's drillships meet all three criteria. All of Shell's proposed operations are under the same SIC code. Shell's exploration activities are located on one or more of their contiguous or adjacent OCS leases; and Shell's operations are under the control of the same company (Shell).

In the commenter's view, EPA's regulations clearly require Shell's exploration project to be permitted as a single major stationary source of air pollution. The regulations do not provide that a stationary source can be defined at a single drill site level. Nor do the regulations allow an applicant to carve up an OCS source into individual drill sites to evade the rigors of major air pollution source review.

## **EPA RESPONSE**

See EPA response to comments Category J-1

## **Comment K-2: 500 Meters vs. 25 Miles**

### **COMMENT**

Commenters disagree with the EPA's explanation given on p.9-10 of the Technical Support Document regarding the 500 meter limits. EPA received comment that nothing in federal or state air pollution law or regulation establishes a 500 meter distance for aggregating or not aggregating pollution from OCS sources. One commenter asserts that the CAA is very clear that all sources within a 25 mile radius of the OCS Source must be included in the emission calculation. By reducing the aggregation distance from 25 miles to 500 meters (0.31 miles), the CAA is ignored.

The NSB believes that using a 500 meter distance in determining whether air pollution must be aggregated for the purpose of major source classification is arbitrary and capricious. The CAA defines an OCS source as a drillships and all other OCS support activities within a 25 mile radius. EPA cannot redefine Congressional intent through a single permitting action. This is a substantive standard, which is elsewhere addressed by regulation; EPA should conduct a formal rulemaking process to implement such an interpretation.

EPA received comment from NAEC that EPA is ignoring the air pollution from the accompanying vessels in the permit estimates for pollution as well as overlap of the ice-breaking and other support vessels that are an integral part of the operations. In effect, it means that the Kulluk and Frontier Discoverer could be drilling at the same time on the same oil prospect, and together the air pollution could be significant to the human and natural environment. NAEC questions EPA's scientific justification for a 500-meter separation as sources when these rigs are part of the same exploration program?

NAEC believes that EPA has acquiesced thus far to Shell's requested and inappropriate interpretation of air pollution sources that segments the analysis for each drill rig and proximity of related vessel pollution sources in order to evade the EPA requirement for a PSD permit. NAEC notes that NO<sub>x</sub> emissions are very close to the 250 ton limit requiring PSD permits. Furthermore, so long as the well sites are 500 meters apart (see Shell's March 26, 2007 Addendum, Item #6), they will be considered separate sources even if the ice-breaking and other vessels are closer together.

### **EPA RESPONSE**

[See EPA response to comments Category J.](#)

[Emissions from support vessels within 25 miles of a drillships conducting exploration activity at a drill site will be counted so as to determine compliance with the 245 tpy NO<sub>x</sub> emissions cap. The inclusion of these support vessels in determining PSD applicability for a given drillships operating at a given drill site is not influenced by the 500 meter](#)

threshold. The 500-meter threshold applies to the distance separating drill site locations occupied by drillships s.

Aggregating drillships s separated by 25 miles does not result in a “common sense notion of a plant” given that there would be no physical connection between the two drill sites, and only vast areas if in open water with no air pollutant emitting activities. On the other hand, EPA determined in this case that activity within 500 meters is close enough to be contiguous and adjacent. One of the goals of the OCS statute was to bring about a more level regulatory playing field between oil and gas activities occurring in State waters and onshore verses on the OCS. To our knowledge, the State of Alaska does not aggregate oil and gas exploration activity in the manner this commenter advocates. Therefore, EPA determined that the 500 meter rather than a 25 mile threshold is reasonable in this case.

## **Category L: Permit Terms and Conditions**

### **Comment L-1: Specific Permit Terms**

Commenters requests more restriction on daily discharges. Currently two tons or more is allowed to be discharged daily, or even more. These discharge rates will impact human activities and subsistence resource. There is no doubt that our way of life will be impacted or deferred.

#### **EPA RESPONSE**

EPA determined that it was not necessary to limit daily air pollutant emissions to protect air quality. Shell demonstrated that its worst-case hourly emissions would not cause or contribute to a NAAQS violation.

One commenter asks if there are plans for in-situ burning if there is an event.

#### **EPA RESPONSE**

Although EPA is not aware of Shell’s plans, if any, to conduct in-situ burning of oil spills, such activity is not authorized under these air permits. Shell does not require a permit to conduct such activity in the event of an emergency.

#### **COMMENT**

REDIOL and NAEC commented that EPA is setting a very poor precedent with its superficial environmental review and lack of specific permit terms and conditions to minimize and adequately monitor the impacts of air pollution in the Beaufort Sea.

## **EPA RESPONSE**

EPA has fulfilled the requirements of 40 CFR Part 55 in issuing Shell minor permits. The applicable minor permit program does not require ambient monitoring to verify that Shell's impacts will not cause or contribute to a NAAQS violation, and the ambient impact analysis demonstrates that such ambient monitoring is not necessary.

Shell is limiting its particulate matter emissions by installing particulate traps and combusting low sulfur 0.05 No. 2 diesel fuel in certain engines. Shell is limiting SO<sub>2</sub> emissions across the fleet by combusting only No. 2 diesel fuel with a sulfur content less than 0.19 percent sulfur by weight. Shell has committed to limiting its NO<sub>x</sub> emissions associated with a particular drill site to less than 245 tons.

## **COMMENT**

NAEC comments that Section 1, Terms and Conditions for the Kulluk Drilling Unit, #1, EPA fails to further specify any limitations regarding the locations: "Minor Permit No. R100OCS-AK-07-01 authorizes the permittee to mobilize, operate and demobilize the Kulluk at a drill site authorized by MMS in the Beaufort Sea OCS in accordance with the terms and conditions of this permit." The same vague condition #1 is given for the Frontier Discoverer permit.

NAEC expressed concern that EPA's vague permit, not only could this permit cover drilling activities on any existing Shell lease block in the Beaufort Sea, but also on future leased areas that have not had adequate environmental impact analysis.

## **EPA RESPONSE**

See EPA response to comments Category H.

## **COMMENT**

The CBD urges EPA not to issue any permits to Shell for the proposed activities unless and until the agency can ensure that mitigation measures are in place that truly avoid adverse impacts, both direct and cumulative to the air quality, and all other resources. The CBD further state that the EPA permits indicate that Shell's program may run through 2001. No environmental review has been prepared past 2007, yet the permits themselves are apparently for indefinite duration

## **EPA RESPONSE**

See EPA response to Category I comments.

ADEC, commented on Alternate Measure 6 and explain that Alaska Statutes require that fuel-burning equipment are subject to 18 AAC 50.055(a) for visible emissions, 18 AAC 50.055(b) for grain loading, and 18 AAC 50.055(c) for sulfur emissions. The

demonstrations provided by the applicant, were not at the worst case conditions. The permit does not restrict the fuel burning equipment from extended operation at worst case conditions. The applicant should demonstrate to the permitting authority that all the requested fuel burning equipment shall meet these standards for the worst case operating conditions.

## **EPA RESPONSE**

See EPA response to comments Category B comments, specifically in reference to emission units K-1, K-2, and K-3 on the Kulluk.

## **Comment L-2: Monitoring and Enforcement**

### **COMMENT**

An individual commenter asks what EPA is doing to protect our way of life when it comes to regulating and monitoring on site project. The commenter expressed concern that there is no regulation, no monitoring on site, which makes it a real concern for the Tribe as well as the Village of Nuiqsut. The commenter noted that if anything can ease the people it would be regulation and monitoring so that we could have eyes and ears on what is happening to our ocean as well as the land. The commenter also inquired about Shell secondary plan is emissions are higher than planned or permitted in addition to plans to reduce air emissions

## **EPA RESPONSE**

If Shell's NO<sub>x</sub> emissions exceed 245 tpy at a single drill site or at aggregated drill sites, Shell would be in violation of the permit term limiting its emissions to less than 245 tpy. Furthermore, Shell may not exceed 250 tpy without first applying for and obtaining a PSD permit.

### **COMMENT**

An individual commenter states that no attempt has been made to assess changes. There have been lots of changes with monitoring. These changes are not included in EPA's analysis. Monitoring methods from years ago has changed from what is being done today. But, that information is not presented to our community to make it easy for us to understand and comment.

The commenter expressed concern about how emissions impact us. It is the commenter's belief that emergency emission occurs without any reaction which raises concern about how emissions are reported. The commenter is concerned that industry is allowed to emit then categorizes them as emergency, routine.

## **EPA RESPONSE**

The final permits that EPA is issuing for Shell are designed to meet the requirements of the CAA, and to protect the members and natural resources of the Alaska Native Villages. The emission limits contained in a number of specific permit terms and conditions are expected to curb air pollution sufficiently so that air quality in the region continues to attain the NAAQS. The NAAQS are national standards which EPA has established to protect human health and the environment. The requirements in the permits also establish additional requirements that are necessary or appropriate to protect human and environmental health, in accordance with EPA's authorities under the CAA. The permits establish strict, federally enforceable, requirements to control and monitor air emissions. EPA expects that these requirements will provide a verifiable means of ensuring that the Shell exploratory drilling project complies with the federal regulations and is operated in a manner that protects the health and welfare of the Native Villages and their resources. See EPA response to comment Category B.

Commenters concerns regarding emergency emissions from other sources are beyond the scope of this permit. Concerns regarding state regulated air emissions should be addressed to ADEC.

## **COMMENT**

Commenters raise questions about monitoring and enforcement of the permits.

## **EPA RESPONSE**

The permits require Shell to comply with specific recordkeeping, monitoring, and reporting requirements. EPA and ADEC work closely to inspect and enforce applicable air requirements throughout Alaska including the North Slope.

See EPA response to comments Category B.

## **COMMENT**

Commenters state that EPA is setting a very poor precedent with its superficial environmental review and lack of specific permit terms and conditions to minimize and adequately monitor the impacts of air pollution in the Beaufort Sea.

## **EPA RESPONSE**

EPA has fulfilled the requirements of 40 CFR Part 55 in issuing Shell minor permits. The applicable minor permit program does not require ambient monitoring to verify that Shell's impacts will not cause or contribute to a NAAQS violation, and the ambient impact analysis demonstrates that such ambient monitoring is not necessary.

Shell is limiting its particulate matter emissions by installing particulate traps and combusting low sulfur 0.05 No. 2 diesel fuel in certain engines. Shell is limiting SO<sub>2</sub> emissions across the fleet by combusting only No. 2 diesel fuel with a sulfur content less than 0.19 percent sulfur by weight. Shell has committed to limiting its NO<sub>x</sub> emissions associated with a particular drill site to less than 245 tons.

NAEC stated that emissions should be monitored and question the monitoring data from past exploratory drilling analyzed (if, in fact, any was collected by EPA).

### **EPA RESPONSE**

EPA has determined that the terms and conditions in the permit provide adequate and effective monitoring, recordkeeping, and reporting requirements. EPA is not aware of emissions monitoring data being collected from previous OCS air permitting projects to the extent Shell will be collecting data.

### **COMMENT**

ADEC provided comment on Alternate Measure 2. ADEC states that as part of the PSD avoidance requirements, the owner or operator needs to present a verifiable way to attain and maintain the PSD avoidance limit for NO<sub>x</sub>. ADEC believes that the Shell application and the EPA permits do not contain methods or an applicable accuracy for fuel monitoring equipment to protect the PSD avoidance limit. ADEC further notes that a 5% error in fuel flow measurement could allow the NO<sub>x</sub> to exceed the PSD threshold of 250 tpy. A 5%, below the actual flow rate, error in fuel flow measurement with an ORL of 245 tpy would allow the emission units to generate 257.25 tpy of NO<sub>x</sub> if the fuel flow limit is achieved. ADEC maintains that to be consistent with Alaska standards and regulations a verifiable, accurate, protective and defined methodology for measuring fuel consumption should be employed. ADEC further states that to be consistent with 18 AAC 50.542(f)(8) the application should contain verifiable methods and appropriate accuracy for measuring fuel consumption. Finally, ADEC comments that to support this, verifiable calculations are required to prove that under worst case conditions, with the methods and accuracy being implemented, the owner or operator will comply with the limit that has been requested.

### **EPA RESPONSE**

See EPA response to Category B comments.

ADEC provided comments on Alternate Measure 3 by noting that Alaska Statutes and Regulations at 18 AAC 50.544(c)(3) contain language regarding maintenance of the stationary source's equipment meeting the manufacturer's or operator's maintenance procedure standards. ADEC maintains that in order to be consistent with Alaska Statutes and Regulations, the federal approvals need to include the condition required by 18 AAC 50.544(c)(3).

## **EPA RESPONSE**

This requirement has been inserted into the permits as Condition 15.

## **COMMENT**

ADEC provided comment on Alternate Measure 5. ADEC maintains that Alaska Statutes and Regulations at 18 AAC 50.205 contain requirements for certification of any permit application, report, affirmation or compliance certification. ADEC further stated that the certification must include the signature of a responsible official for the permitted source following the statement “Based on the 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”. Binding legal certification is important for both state and federal regulators to be able to prosecute fraudulent reporting. In order to be consistent with Alaska standards and regulations, the federal approvals need to contain statements of binding legal certification for the applicant to sign.

## **EPA RESPONSE**

Susan Childs of Shell submitted a letter to EPA on May 24, 2007 with which contained the following certification, “Based on the information and belief formed after reasonable inquiry, I certify that the statement and information in and attached to the permit application and this document are true, accurate, and complete.”

A new Condition 17 of the permit has been added requiring that all information submitted to EPA be certified.

### **Comment L-3 Persistent Organic Pollutants**

## **COMMENT**

EPA received an individual commenter stated that we need to stop all persistent organic pollutants from being discharged during development and exploration.

## **EPA RESPONSE**

The final permits that EPA is issuing for Shell are designed to meet the requirements of the CAA. Emission limits contained in a number of specific permit terms and conditions are expected to curb air pollution sufficiently so that air quality in the region continues to attain the NAAQS. The NAAQS are national standards which EPA has established to protect human health and the environment.

## **Category M: Endangered Species Act**

### **Comment M-1: Compliance with the ESA**

#### **COMMENT**

The CBD commented that EPA's permits are not in compliance with the Endangered Species Act (ESA). The CBD stated that at least three listed species, the bowhead whale and the Steller's and spectacled eiders, occur in the action area. As such, the CBD believes that the EPA must complete section 7 consultation prior to issuing Shell's proposed permit.

#### **EPA RESPONSE**

Only the bowhead whales occur within the action area for this project. Other federal agencies<sup>8</sup> consultation and biological opinions (BO), biological evaluations (BE), and environmental assessments (EA), concluded that the proposed project will not cause jeopardy to threatened or endangered species in the proposed project area. In addition, the documents prepared by those federal agencies contain an incidental take statement, reasonable and prudent measures, conservation recommendations and other conditions to ensure that the proposed project minimizes impacts on threatened and endangered species. As a result of the work completed by the MMS (lead agency), U.S. Fish and Wildlife Service (USFWS), and National Oceanic Atmospheric Administration Fisheries Service (NOAA Fisheries), EPA has determined our obligations arising under ESA or EFH have been satisfied.

### **Comment M-2: Biological Opinion**

#### **COMMENT**

The CBD also commented on the BO. According to the CBD, MMS' BE for Lease Sale 202, only addressed the bowhead whales and did not include an analysis for the spectacled or Steller's eiders. In order for the USFWS to ensure that the eiders are not jeopardized, MMS must prepare a Biological Evaluation for the eiders for Lease Sale 202 and re-initiate consultation with USFWS. Since the BO for Lease Sale 202 was prepared, Bureau of Land Management (BLM) has approved and sold additional oil and gas leases in the Arctic National Wildlife Refuge. These leases should have been considered in the baseline for this project. Thus, a new BO is required. In addition, the CBD states that the USFWS and MMS acted arbitrarily in concluding that the October 2002 BO was sufficient for purposes of analysis of the effects to eiders from this lease sale.

---

<sup>8</sup> MMS, USFWS (US Fish and Wildlife Services), NOAA (National Oceanic Atmospheric Administration ) Fisheries Service

## EPA RESPONSE

As explained in more detail in EPA's response to comment in Category W, under the CAA, EPA is not required to conduct a NEPA review. The MMS did develop an EA for Shell's exploration plan, which covers activities during the 2007 open water season Sivilluq prospect and additional prospects in 2008 and 2009. This EIA addressed the proposed activities and their impacts on subsistence activities. The MMS contacted the USFWS and NOAA Fisheries on the need to consult. The MMS had previously consulted on the multi-lease sale (186, 195, and 202) and biological opinions were prepared by the NOAA Fisheries. An updated BO, the Arctic Regional Biological Opinion (ARBO) was prepared by NOAA Fisheries in 2006.

The USFWS concurred with MMS that the conclusions, incidental take statement, reasonable and prudent measures, conservation recommendations, and other sections contained in the October 22, 2002 BO were still valid for Lease Sale 195, including information regarding the Spectacled eiders (*Somateria fischeri*) and Steller's eiders (*Polysticta stelleri*). The threatened eiders do not occur in the Sivilluq prospect and thus were not evaluated for this project.

On June 28, 2004, NOAA Fisheries Service responded to a new biological evaluation (BE) prepared by MMS on June 9, 2004, indicating that NOAA Fisheries believed that the conclusions and recommendations they made in the 2001 Regional BO remain appropriate and applicable. The species evaluated by NOAA Fisheries that occur in the proposed action area were the bowhead whales (*Balaena mysticetus*).

On February 15, 2007, MMS completed a site-specific EA and issued a finding of no significant impact (FONSI) for Shell's exploration plan. The EA and exploration plan cover the 2007 open water season, with potential additional projects in 2008/2009 based upon the results of the 2007 drilling. The area covered by the EA and exploration plan is the Sivilluq prospect in western Camden Bay in the Beaufort Sea. A copy of MMS approval letter and the FONSI can be found at [http://www.mms.gov/alaska/ref/PublicInfo/Shell\\_BF/SOI\\_ep\\_approval.pdf](http://www.mms.gov/alaska/ref/PublicInfo/Shell_BF/SOI_ep_approval.pdf). The MMS indicated that they received no comments on the FONSI or the EA. The approval letter addressed tasks that Shell must complete prior to beginning exploration activities. These include:

- Completion by Shell of a Conflict Avoidance Agreement and determination by MMS of adequacy of measures taken to prevent unreasonable conflicts with subsistence harvests.
- Prohibition of exploratory drilling activities from August 1 through October 31 without an approved site-specific bowhead whale monitoring program in accordance with Sale 195 lease stipulation 4.
- Restrictions on lease-related use when the MMS determines the restrictions are necessary to prevent unreasonable conflicts with local subsistence hunting activities.

- Submittal of a lighting plan to lessen impacts on birds and reduce potential for bird collision.
- Prohibition of exploratory drilling activities until a final incidental hazard assessment (IHA) is received from NOAA Fisheries and Letter of Authorization from USFWS as appropriate for the proposed activity.

As the agency responsible for managing the mineral resources of the Alaska Outer Continental Shelf, the MMS leases federal lands for the exploration and development of oil and gas reserves. In order to conduct those sales, MMS prepares EISs and EAs as necessary. During the preparation of these materials, the MMS discusses the environmental consequences and cumulative effects of various development scenarios of the hydrocarbon-resource potential of the Beaufort Sea. Because MMS considers all the routine permitted industrial activities associated with oil and gas development, EPA deferred to MMS as the lead federal agency for consulting with the USFWS and the NOAA Fisheries (NOAA Fisheries, also referred to as “NMFS”) as required under section 7 of the ESA, 16 U.S.C. §1531 *et seq.*, and section 305(b)(2) (essential fish habitat, i.e., EFH) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), 16 U.S.C. § 1801 *et seq.* In the MMS approval of Shell’s Exploration Plan and Finding of No Significant Impact (FONSI), dated February 15, 2007, MMS stated: “Our analysis of the potential effects of the proposed action assumes that all aspects of the proposed activities occur as described in the EP and that Shell’s proposed activities will comply with all other statutory and regulatory requirements, lease stipulations, conditions of permits, and conditions of approval of the EP as outlined below. If these aspects of the proposed action are not met, our EA and FONSI would no longer be applicable. Additional NEPA review of the modified proposed activities would be needed.”

Therefore, it is not EPA’s responsibility to develop the biological assessments or engage in other consultation activities with the USFWS or NOAA Fisheries (the Services) on which the BO issued by the Services occur. EPA has deferred to MMS, and expects that MMS will consult with the Services as necessary on future leases and exploration plans that are submitted by Shell.

## **Category N: Environmental Justice**

### **Comment N-1: EPA’s Environmental Justice Obligation**

#### **COMMENT**

The NSB, environmental groups and individual commenters submitted numerous comments regarding Environmental Justice concerns. Specifically commenters explain that communities of Alaska’s North Slope have long used the marine resources of the Beaufort Sea for both subsistence practices and cultural identity. They express concern about EPA’s disregard for environmental justice and subsistence rights for Alaska Native residents, failure to adequately conduct government-to-government consultation, and failure to consider major impacts to the human and natural environment.

In their comments the NSB explains that after more than 30 years of gradually expanding oil and gas development, North Slope residents have grown increasingly concerned about the impacts of oil and gas activities on every aspect of their health and well-being, and about the lack of attention to this issue in regulatory and permitting decisions. According to the NSB, residents of Nuiqsut have testified to marked increases in pulmonary disease since the onset of operations at the Alpine Central Processing Facility. In spite of their testimony, regulatory decisions are still based on scant data and models which have not been validated under Arctic conditions, with no monitoring data whatsoever available for some of the most concerning pollutants – namely PM<sub>2.5</sub> and the HAPs commonly associated with oil and gas operations.

The NSB provided documentation regarding the overall mortality rates and increasing chronic pulmonary disease mortality rates, high cancer incidence and mortality rates among North Slope Alaska Natives. It noted that many health professionals working in our region have noted that the North Slope community appears particularly vulnerable to respiratory infections. The NSB emphasized that it is in this context – that of a community with substantial health disparities and baseline vulnerability – that the significance of Shell’s plan must be evaluated. The NSB asked EPA to evaluate Shell’s proposed permit request with a strong emphasis on the principles and requirements of Environmental Justice. Although seeking to avoid a “major source” designation may be expeditious for Shell from a business perspective, it is a flagrant and grievous violation of the principles of environmental justice. Given the already distressing increases and alarmingly high rates of pulmonary disease and cancer, the North Slope population warrants a particularly cautious regulatory approach to prevent further incremental degradation of our health.

The NSB maintains that the EPA should recognize that the North Slope Inupiat population has particular vulnerabilities due to both their dependence on subsistence activities and wild foods, and due to the substantial baseline health disparities between their population and the general U.S. population.

Finally, the NSB commented on what may in the end be among the most significant impacts of actions which appear to us to show a deep disregard for Alaskan Native health. The NSB identified that stress, fear and tension caused by multiple, simultaneous, and increasingly frequent proposals for development in the heart of the subsistence region are in and of themselves among the most difficult health problems we face, made worse by regulatory decisions that appear to value industry convenience over the well-being of our communities. The NSB stated that these effects and the tension and emotion caused by this proposed permitting decision were made crystal clear in the public meeting and hearing conducted by EPA in Nuiqsut, May 8. Rates of suicide, domestic violence, and other social pathology are epidemic on the North Slope. The NSB maintains that it is precisely the type of concern represented by this permit application – that of actions that threaten not only to directly harm our health but to contaminate our subsistence resources as well – that leads to feelings of desperation, anxiety, helplessness, and anger among our

residents. Sincere efforts by regulators to protect our health would go a long way toward preventing this problem.

## **EPA RESPONSE**

EO 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this permitting action rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. As explained above in EPA response to comment D-2, the final permits are designed to meet the requirements of the CAA, and to protect the people and natural resources of the Alaska Native Villages. The emission limits contained in a number of specific permit terms and conditions are expected to curb air pollution sufficiently so that air quality in the region continues to attain the NAAQS, national standards which EPA has established to protect human health and the environment. The permits also contain additional requirements that are necessary or appropriate to protect human and environmental health, in accordance with EPA's authorities under the CAA. EPA expects that these requirements will provide a verifiable means of ensuring that the Shell exploratory drilling project complies with the federal CAA and is operated in a manner that protects the health and welfare of the Native Villages and their resources.

Furthermore, as described in more detail in response to Comments P and Q. EPA has satisfied its' regulatory obligations regarding public participation through the public notice and comments process. The North Slope Communities have been provided the opportunity for involvement in the permit decision making process.

## **Category O: Government-to-Government Consultation**

### **Comment O-1: Consultation with Alaskan Native Communities**

#### **COMMENT**

The NSB indicates that it has been disappointed in both the state and federal agency's lack of response to the comments and concerns submitted by NSB, ICAS, Alaska Inter-Tribal Council, and individual NSB residents on the very important issue of the impact of air pollution on the health of our residents and subsistence resources. It is the NSB's belief that MMS and the EPA, in particular, have a responsibility to consult with the tribes and the NSB on air pollution impacts to human health and subsistence resources,

and a federal trust responsibility to ensure that development in the region does not harm health, resources, a way of life. Shell's application lacks data to adequately assess human health impacts to our coastal communities and to subsistence hunters and subsistence resources that will be located downwind of Shell's large industrial pollution source.

EPA clearly failed to meet its tribal and government-to-government responsibilities on this air permit, and hearing process, thwarting meaningful public participation. While the May 8th hearing was held in Nuiqsut and residents had to stop their spring subsistence activities to participate. Barrow and Kaktovik residents were unheard because attendance at the hearing would have required them to place a lower priority on subsistence. NSB residents were extremely dissatisfied with the EPA public process for this air permit. MMS and ADEC provided no public process at all for input on the air permit. The commenters urge EPA not to issue any permits to Shell for the proposed activities until full and adequate public participation has occurred and environmental review of the cumulative impacts of such activities on the air quality of the region has been undertaken.

## **EPA RESPONSE**

The North Slope Alaskan Native Village communities are important partners in EPA'S efforts to protect air quality on the North Slope of Alaska. As such we encouraged and welcomed community input on issues related to the air quality aspects of these permit. On February 21, 2007, EPA sent a letter and fact sheet via certified mail to the Presidents, Chairman, Village Coordinator, and First Chiefs of 30 federally-recognized tribes, inviting tribes to initiate government-to-government consultation if they desired. The Native Village of Nuiqsut responded to EPA's request to initiate government-to-government consultation. EPA offered to initiate consultation with a conference call and to follow-up with a meeting in Nuiqsut with the Native Village of Nuiqsut. EPA and Nuiqsut scheduled a government-to-government consultation conference call on March 26, 2006. EPA initiated the call on March 26 with the Native Village of Nuiqsut, however, due to the Village's conflicting schedules representatives from the Native Village of Nuiqsut were unable join the call.

On April 5, 2007 EPA widely distributed Shell's two permit applications, EPA's two proposed air permits, and EPA's technical support document/ statement of basis for the proposed permits. A Notice of Public Comment and Public Hearing were sent on April 5, 2007 to Barrow, Nuiqsut, and Kaktovik and EPA's Offices in Anchorage, Alaska. The notice informed interested parties that a public hearing would be held in Nuiqsut on May 8, 2007 and that public comments were/could be submitted until May 12, 2007. EPA offered to hold hearing in Barrow and Kaktovik. Barrow did not respond to EPA's request to set up a public hearing and Kaktovik declined the offer due to scheduling conflict. Thus, the details of Shell's air pollution impacts and EPA's preliminary decision were documented in writing and were available to the public. Additionally, a hard copy of the materials was made available for public review at the Nuiqsut, Barrow, and Kaktovik City Offices and in EPA's Offices in Anchorage, Alaska and Seattle, Washington. Written comments that EPA received on the proposed permits were also posted on the website and made available for public review. Details of Shell's air

pollution impacts and EPA's preliminary permit decisions were documented in writing and available for public review.

On May 8, 2007, EPA Region 10 representatives held an informational session for questions and answers in Nuiqsut, Alaska. During this meeting, EPA explained the proposed permits and the relevant air quality factors that were considered in the proposed permits. Following the informational session, a public hearing was held, and recorded, during which individual community members provided oral or written public comments. The information session and the public hearing were advertised ahead of time in the Anchorage Daily News and were open to the public.

EPA believes it provided adequate time and opportunity for the public, including the Native Villages, to consult with EPA regarding the proposed permits and to participate in the permit decision.

EPA acknowledges that the federal government has a trust responsibility to federally-recognized Tribes and Alaska Native Villages. EPA believes its actions have been consistent with its responsibility to consult on a government-to-government basis. EPA offered an opportunity to provide their views and concerns on the proposed permit and has fully considered the issues raised by the Native Villages prior to issuing the final permit to Shell. Thus, EPA is satisfied that it has consulted with the affected Alaska Native Communities consistent with its trust responsibility while fulfilling its duties under the CAA.

## **Category P: Public Comment**

### **Comment P-1: Request for Extension of Public Comment Period**

#### **COMMENT**

Commenters were disappointed with EPA's public comment period. The NSB specifically referred to public comments raised during Alaska Department of Natural Resources (ADNR) public hearing. ADNR conducted public hearings during April 5-6, 2007, in Nuiqsut and Kaktovik, for the consistency determination on Shell's Exploration Plan. During those hearings many residents expressed grave concern about air quality and the potential impacts to human health and subsistence resources from large industrial sources of air pollution operating in the OCS.

The NSB noted that EPA conducted a public hearing in Nuiqsut on May 8, 2007. They further state that EPA's hearings were held in direct conflict with subsistence activities. Although the NSB requested EPA to either postpone the air permit hearings into April to avoid the subsistence conflict, the commenter state that EPA ignored this request. When EPA set the hearings in May 2007, NSB again formally requested the hearings to be deferred until after the traditional spring subsistence activities were concluded in the first

week of June. This would allow EPA an opportunity to expand their public hearing schedule to include hearings in Barrow and Kaktovik. It is the NSB's position that EPA again ignored this request, and it was not until May 8<sup>th</sup> the date of the Nuiqsut hearing that EPA finally provided a written response to NSB's April 18, 2007 letter.

## **EPA RESPONSE**

The NSB requested that EPA defer the public hearing that was scheduled for May 8, 2007 in Nuiqsut, Alaska to June 4, 2007 and extend the public comment period until after any rescheduled hearings were complete. The request explained that May was a critical subsistence harvest month for marine mammals, including the bowhead whales and that due to the subsistence harvest and cultural activities the residents would effectively be unable to participate during a public comment period in May. After careful consideration EPA decided not to defer the public hearing or to extend the public comment period. Accordingly, for reasons explained in EPA's response to NSB, the public comment period for the proposed Air Quality Control Minor Permits Nos. R10OCS-AK-07-01 and R10OCS-AK-07-02 to Shell. closed on May 12, 2007.

## **Category Q: Public Hearing**

### **Comment Q-1: Lack of Information During Nuiqsut Public Hearing**

#### **COMMENT**

During EPA's public hearing in Nuiqsut, individual commenters requested that the record indicate that they did not get all the information requested regarding EPA's implementation of the CAA. These commenters did not believe that EPA provided adequate answers to their questions. Several commenters requested for EPA to have another public hearing to address all the questions and comments raised. They also requested EPA to include staff involved in the water related issues.

Another individual requested that information be provided prior to scheduling a public hearing so that the public can read make a proper presentation. The commenter thought the public notice about the hearing was too short.

A comment requested a second hearing regarding the Clean Water Act (CWA) so that EPA could provide the community of Nuiqsut with information on how EPA is going to keep the Beaufort Sea clean.

## **EPA RESPONSE**

As discussed in EPA's response to comment Category O, the required advance notice was provided for the public hearing. A hard copy of the materials was made available for public review at the Nuiqsut, Barrow, and Kaktovik City Offices and EPA's Offices in

Anchorage, Alaska and Seattle, Washington and on EPA's air quality webpage on April 5, 2007. Details of Shell's air pollution impacts and EPA's preliminary permit decisions were documented in writing and available for public review. The proposed permit technical support document, fact sheet, and application materials were made available by EPA at least 30 days prior to the public hearing.

EPA recognizes the frustration the public has about the lack of information regarding the CWA during the information meeting and public hearing in Nuiqsut on May 8 2007. However, the purpose of the meeting was to provide information and to seek public comment about Shell's minor source air permits for the protection of air quality .

Comments and concerns regarding any potential water impacts associated with Shell's offshore exploratory oil and gas activities were beyond the scope of the meeting and hearing and are not relevant to these permits.

## **Category R: Coordination Between Agencies**

### **Comment R-1: EPA Jurisdiction**

#### **COMMENT**

Questions were raised regarding EPA's authority and its relationship with MMS regarding issuing an air quality permit for Shell's project.

#### **EPA RESPONSE**

EPA has the authority to issue permits regulating the air emissions associated with oil and gas activity in the OCS. MMS has the authority, among other things, to approve lease sales and exploration plans. It is worth noting that the purpose of public hearing was for EPA to gather additional information to consider as EPA completes the permit process. The response to comments and the final permits are our responses to the issues raised.

### **Comment R-2: EPA Coordination**

#### **COMMENT**

Several commenters expressed frustration on a lack of coordination between regulatory agencies.

#### **EPA RESPONSE**

EPA has worked closely with the ADEC throughout this permitting process. Specifically, upon receipt of Shells initial Notice of Intent, EPA coordinated with ADEC to complete the consistency update required by CFR Part 55. In reviewing Shells' permit

applications and drafting the permit terms and conditions in the proposed permit, EPA staff worked consistency and closely with MMS's staff in order to fully understand that Agency's review and approval of the Exploration Plan. Additionally, as explained in EPA's response to comments Category M, EPA has reviewed MMS assessment of the exploratory drilling projects' impact on endangered species evaluation. EPA will continue to work closely with and consult with the relevant state and federal agencies on OSC related issues.

### **Comment R-3: Minerals Management Service Air Quality Regulations**

#### **COMMENT**

The NSB comments that MMS regulations at 30 CFR 250.218(a)(1) require Shell's Exploration Plan to include the projected peak hourly emissions; total annual emissions in tpy; emissions over the duration of the proposed exploration activities; frequency and duration of emissions; and total of all emissions. In addition, MMS regulations, 30 CFR 250.218(2), require the operator to base the projected emissions on the maximum rated capacity of the equipment on the proposed drilling unit under its physical and operational design. The NSB contends that the requirements of 30 CFR 250 have not been fully met, and this obligation remains a MMS responsibility that has not been satisfied. The NSB refers to its discussion with EPA regarding this concern and that EPA confirmed MMS's regulations were not equivalent to EPA's. The NSB also stated that their understanding, based on discussions with EPA is that EPA is not responsible for meeting the criteria of 30 CFR 250.<sup>9</sup>

#### **EPA RESPONSE**

EPA has determined that Shell's permit application and the final permit comply with the CAA requirements. Comments concerning compliance with the MMS regulations should be addressed to MMS.

---

<sup>9</sup> April 6, 2007 meeting between Dan Meyer EPA and NSB.

## **Category S: Class One Areas**

### **Comment S-1: Impacts to the Arctic Wildlife Refuge, Teshekpuk Lake**

#### **COMMENT**

REDOIL expressed an interest in the proposed permit because it is their belief that Shell Oil's drill rigs and associated support operations will degrade the pristine environment of the Beaufort Sea, and in particular off the coast of very sensitive subsistence use areas within the ANWR, Teshekpuk Lake, and the region.

#### **EPA RESPONSE**

Shell's drill rigs and associated support operations will not degrade air quality in any areas designated by the United States Congress as requiring special protection under the CAA. On August 7, 1977, the United States Congress designated certain areas to receive special consideration under the CAA to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value. These "Class I" areas include pre-existing international parks, pre-existing national wilderness areas which exceed 5,000 acres in size, pre-existing national memorial parks which exceed 5,000 acres in size, and pre-existing national parks which exceed 6,000 acres in size. 42 U.S.C. § 7472(a).

In Alaska, the passage of the 1977 CAA Amendments created the following Class I areas: Bering Sea, Simeonof, and Tuxedni National Wilderness Areas along with the Denali National Park. See 40 C.F.R § 81.402.

Of these four Class I areas, the Denali National Park is nearest to the North Slope of Alaska. Approximately 450 miles separate the Denali National Park from the North Slope of Alaska. At this distance, it is reasonable to conclude that Shell's proposed air pollutant emitting activities will not have any impact on a Class I area.

The areas identified by commenters, ANWR and Teshekpuk Lake, are not classified as Class I areas and thus are not entitled to Class I protection. Concerns regarding air quality classifications in the ANWR, Teshekpuk Lake, and other regional areas should be addressed to the Governor of Alaska. Federal law permits a State to designate Class I areas as it deems appropriate. 42 U.S.C. §7474(a).

## **Category T: Clean Water Act**

### **Comment T-1: NPDES Permit**

#### **COMMENT**

A number of comments were received expressing concerns about impacts on water quality. Specifically, the discharge of human waste or air discharge at a much higher level is anticipated. Additionally, commenters stated that drilling discharges to the ocean will result in changes to water quality, temperature, turbidity, salinity, turbulence, current; changes to the uses of water; microscopic changes; and changes to the animals that use the water and the people that use the animals. Concern was also expressed about discharge of muds into the Beaufort Sea.

#### **EPA RESPONSE**

EPA understands that the North Slope Communities have a number of concerns regarding the potential for water quality related impacts associated with Shell's off shore operations. As stated in EPA's response to comments Category Q, comments regarding water impact are beyond the scope of this permit.

## **Category U: Oil Spill Response Plan**

### **Comment U-1: Oil Spills**

#### **COMMENT**

Several individuals expressed concern about Shell's ability to clean oil spills in the Beaufort Sea or arctic water. Commenters stated that there is no proven method of adequately cleaning up after a spill in open waters. An individual commented that the vessels that are being used in Shell's project have never seen harsh climate or waters as exist in upper Alaska or the North Slope. This commenter stated that these vessels do not have experience, nor staff with experience in local weather conditions, which make it even harder for them to react or appropriately take care of their personnel as well as property if an incident did occur.

There was concern raised about the possibility of environmental impact if an iceberg collided with the drillships and resulted in a diesel spill. Many commenter felt that a spill in the Beaufort Sea could result in rapid deterioration of lives.

#### **EPA RESPONSE:**

See EPA response to comments Category T.

## **Category V: Global Warming**

### **Comment V-1: Global Warming Impacts**

#### **COMMENT**

Global warming is a real reality in the world. What is EPA doing to slow this down?

#### **EPA RESPONSE**

The commenter's concerns regarding global warming do not contain enough specificity relating to a deficiency in the permit to require a detailed response. EPA offers the following discussion.

On April 2, 2007, the U.S. Supreme Court held that greenhouse gases are air pollutants under the Clean Air Act. Massachusetts v. EPA, 127 S.Ct. 1438 (2007). Currently, EPA is moving forward to meet the Supreme Court's decision in a thoughtful, deliberative manner, considering every appropriate option and every appropriate tool at our disposal. In that context, President Bush on May 14 directed EPA and the Departments of Energy, Transportation, and Agriculture to take the first steps toward regulations that would cut gasoline consumption and reduce greenhouse gas emissions from motor vehicles. The President asked that we base this work on the "Twenty in Ten" plan announced in his State of the Union address to reduce U.S. gasoline consumption by 20 percent over the next ten years. This announcement represents the Administration's continued commitment to address climate change and energy security in a comprehensive and thoughtful manner. It both responds to the Supreme Court's recent ruling and provides a path forward for improving our energy security by reducing U.S dependence on oil. In addition to the Administration's new climate change and energy independence initiatives, EPA supports many ongoing climate initiatives.

The Bush Administration is meeting unparalleled financial, international, and domestic commitments to the reduction of greenhouse gas emissions, and EPA plays a significant role in fulfilling those commitments. We will continue to move forward to address climate change in ways that produce meaningful environment benefits and maintain our nation's economic competitiveness.

## **Category W: National Environmental Policy Act**

### **Comment W-1: Environmental Impact Statement**

#### **COMMENT**

Several individuals, including REOIL, CBD, and NAED commented on EPA's failure to comply with NEPA. Specifically, commenters stated that an EIS is warranted due to the

intensity and duration of the proposed program and its controversial nature. Commenters also maintained that an EIS is needed because of the high environmental sensitivity of the marine and coastal waters used by endangered bowhead whales, polar bears, migratory birds, essential fish habitat including that used by arctic char and other migratory anadromous fish, and close proximity to the protected National Wildlife Arctic Refuge where the Porcupine and Central Arctic Caribou herds feed on sensitive vegetation during calving, post-calving, and insect-relief periods. Commenters stated that drilling will take place in important polar bear feeding, denning, and migratory habitats identified for protection by the Agreement on the Conservation of Polar Bears, an international treaty and air pollution may affect its essential sea ice habitats and add to the bear's body burdens of pollutants.

EPA received comments that there is insufficient site specific analysis of the sources and impacts of air pollution from the drill rigs, flaring that may occur from well testing, as well as all of the associated support vessels, helicopter support, and potential smoke from in-situ burning in the event of a major spill. Commenters maintain that the cumulative impacts of this Shell's drilling program along with its seismic and other geological activity being conducted at the same time needs to be addressed in combination with other air pollution sources caused by oil and gas exploration, development and production as well as other sources.

It was suggested to EPA that EPA needs to perform an EIS because of human health impacts from the air pollution, especially due to the proximity of the village of Kaktovik (about three miles). In addition, commenters felt that the location of these activities right in the subsistence hunting and fishing grounds of Inupiaq residents across the Beaufort Sea who will be disproportionately harmed, warrants an EIS.

EPA was urged not to issue any permits to Shell for the proposed activities unless and until the agency can ensure that mitigation measures are in place that truly avoid adverse impacts, both direct and cumulative to the air quality, and all other resources, and only after full and adequate public participation has occurred and environmental review of the cumulative impacts of such activities on the air quality of the region has been undertaken.

There is a general belief by commenters that the proposed permits do not meet these standards and therefore violate the CAA, the NEPA, and other governing statutes and regulations.

## **EPA RESPONSE**

Congress specifically exempted actions under the CAA from the requirement that an EIS be prepared for the permit. The Statute, 15 U.S.C. § 793(c), provides:

No action taken under the CAA shall be deemed a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969.

Section 7(c) of the Energy Supply and Environmental Coordination Act of 1974 (15 U.S.C. 793(c)(1)) exempts actions under the CAA from the requirements of NEPA. This means that EPA is not required to develop an EIS prior to issuance of an air quality permit. The MMS, which is subject to NEPA, has developed an EA in support of its approval of Shell's Exploration Plan.<sup>10</sup>

EPA believes that this is not the proper forum to discuss the EA conducted by MMS for the exploratory drilling operation. The NEPA process that the MMS oversees for this type of activity is outside EPA's consideration in the OCS permit context. There is no basis for EPA's consideration of this issue in the context of the Shell's air quality permit for the exploratory oil and gas drilling operation.

## **Category X: Subsistence and Traditional Use**

### **Comment X-1: Subsistence and Traditional Use Impacts**

#### **COMMENT**

Individual commenters as well as the environmental organizations expressed numerous concerns regarding the Alaska Native subsistence hunting and traditional use. The comments expressed concern regarding off shore oil and gas operations generally and Shell's project in particular. Individual comments addressed fears that the project would impact their traditional lifestyle, interfere with bowhead whale migration patterns with resulting impact on ability to safely gather food for their villages, concern with noise impacts on traditional use, increase health and safety factors in traditional and cultural uses. Commenters stated that as the whale migration patterns change it will force whales further out and making hunting more difficult. A commenter requests that the issue about a deferral area be revisited for the Village of Nuiqsut for their whaling grounds and subsistence resources.

A specific request was made to EPA that drilling and seismic activity not occur during migration of the bowheads and the seals and during the hunting season. The commenters strongly oppose the open water seismic testing and staging of exploratory wells during the migration of bowheads. Individuals go on to assert that the community of Nuiqsut and the other seven villages and all the whaling communities depend on these whales. EPA was informed that the Arctic Ocean provides food for the native people such as whales, beluga, seals, ducks, walrus and all kinds of fish.

Commenters were concerned that Shell has lease blocks very near to Cross Island, an important subsistence whaling location, and other lease blocks which encompass key subsistence use areas for the village of Nuiqsut. There was concern expressed by several

---

<sup>10</sup> [http://www.mms.gov/alaska/ref/EIS%20EA/SOIea/SOI\\_ea.pdf](http://www.mms.gov/alaska/ref/EIS%20EA/SOIea/SOI_ea.pdf)

commenters about the impact of air pollution in the Beaufort Sea during the open water season.

Concern was expressed to EPA about the impact of the proposed activities on rare and endangered wildlife and their habitats, the air quality, and on the communities' dependant on these species and habitats and air quality. Several commenters stated that Nuiqsut is the most impacted village in the North Slope. They maintain that Nuiqsut residents stated that whaling is important to the entire community of Nuiqsut and seven other villages. In addition, it was stated that Shell's proposed project is located right in a subsistence use area, where humans will be conducting subsistence activities, and communities downwind of the operations will be exposed to substantial air pollution. EPA was informed that it is critical that subsistence hunters and the subsistence resources themselves are not exposed to high levels of air pollution.

The NSB noted that during ADNR's April 5-6, 2007, public hearings in Nuiqsut and Kaktovik, residents pointed out that marine mammals, especially whales, are very sensitive to smell, and asked what was known about the impact of industrial air pollution in the OCS on subsistence resources. Many people also testified about the psychological effects on residents of stress and loss of cultural identity, as well as health concerns from air, terrestrial and water pollution from discharges and contaminants associated with industry practice.

The NSB expressed disappointment in both the state and federal agency's lack of response to the comments and concerns submitted by NSB, ICAS, Alaska Inter-Tribal Council, and individual NSB residents on the very important issue of the impact of air pollution on the health of our residents and subsistence resources. MMS and the EPA, in particular, have a responsibility to consult with the tribes and the NSB on air pollution impacts to human health and subsistence resources, and a federal trust responsibility to ensure that development in the region does not harm our health, our resources, or our way of life. Shell's application lacks data to adequately assess human health impacts to our coastal communities and to subsistence hunters and subsistence resources that will be located downwind of Shell's large industrial pollution source.

## **EPA RESPONSE**

EPA understand the heartfelt concerns expressed regarding Shell's potential impact on the bowhead whale migration patterns and other potential impacts to the Inupiat subsistence hunting and fishing and interference with the traditional lifestyle. However, as explained in EPA's response to comment Category D above, EPA analysis indicates that this project, as regulated by the terms and conditions in the final permit, will not cause or contribute to a NAAQS violation. Since NAAQS are established to protect public health, the project will not have an adverse impact upon public health.

Any potential impact on the Inupiat subsistence hunting or lifestyle is not a factor that the CAA requires EPA to consider. Therefore, evaluation of impacts to subsistence hunting and fishing is beyond the scope of these permits.

In the FONSI developed by the MMS for the Shell Offshore Exploration Plan, and in its approval letter for the exploration plan, the MMS did consider the effect and impacts of exploration on subsistence hunting and lifestyle. In its approval of the plan, dated February 15, 2007, MMS added the following conditions.

*“The OCS Sale 195 Lease Stipulation 4 requires operators to conduct a site specific bowhead whale monitoring program during the conduct of exploratory drilling operations during specific periods and depending on the drilling location. The stipulation requires that daily monitoring results be reported to the MMS. The stipulation also requires that the monitoring program must be reviewed and approved each year before exploratory drilling can commence. The applicable dates when monitoring is required will depend on the drilling location and the whale migration periods as listed in Lease Stipulation 4. No exploratory drilling activities can be conducted from August 1 through October 31, 2007, without an approved site-specific bowhead whale monitoring program.*

*“As noted in Sale 195 Information to Lessee (ITL) clause (j), "Lessees are further advised that the regional supervisor of the field office (RS/FO) has the authority and intends to limit or suspend any operations, including preliminary activities, as defined under 30 CFR 250.201, on a lease whenever bowhead whales are subject to a threat of serious, irreparable, or immediate harm to the species." Should information obtained from MMS Bowhead Whale Aerial Survey Project (BWASP) or Shell's monitoring program indicate that there is a threat of serious, irreparable, or immediate harm to the species; the RS/FO will take action to protect the species. The ITL further notes that the MMS and the [NOAA Fisheries Service (NOAA Fisheries)] will establish procedures to coordinate results from monitoring surveys required by Lease Stipulation 4 and [NOAA Fisheries]'s Incidental Harassment Authorization (IHA) to determine if modification to lease operations are necessary. To administer this responsibility, the MMS will develop a coordination plan with Shell, NMFS, Alaska Eskimo Whaling Commission (AEWC), and North Slope Borough (NSB) to assure that information from Shell's monitoring program, BWASP, subsistence hunting activities, and conflict avoidance programs are available on a daily basis.*

*“As indicated in the EP, Shell will obtain Marine Mammal Protection Act (MMPA) authorizations from [NOAA Fisheries] and U.S. Fish and Wildlife Service (USFWS) before commencing operations. Lease Stipulation 5 and [NOAA Fisheries]'s IHA process require that conflict avoidance measures are negotiated and agreed to between the operator and the affected communities. The final conflict avoidance agreement must be submitted to NMFS for MMS to make a determination on the adequacy of measures taken to prevent unreasonable conflicts with subsistence harvests before activities can commence.*

*“In accordance with Sale 195 Lease Stipulation 5, if necessary because no agreement on conflict avoidance measures can be reached between the parties,*

*MMS will call a meeting with representatives from the subsistence communities, AEWG, NSB, NMFS, and Shell to specifically address the conflict and attempt to resolve the issues before MMS and [NOAA Fisheries] make a final determination on the measures to be taken to prevent unreasonable conflicts with subsistence harvests.*

*“Lease Stipulation 5 also requires that Shell notify the RS/FO of all concerns expressed by subsistence hunters during operations and of steps taken to address such concerns and that the RS/FO work with agencies and the public to assure potential conflicts are identified and efforts taken to avoid conflicts.” See [http://www.mms.gov/alaska/ref/PublicInfo/Shell\\_BF/SOI\\_ep\\_approval.pdf](http://www.mms.gov/alaska/ref/PublicInfo/Shell_BF/SOI_ep_approval.pdf) [http://www.mms.gov/alaska/ref/PublicInfo/Shell\\_BF/SOI\\_ep\\_approval.pdf](http://www.mms.gov/alaska/ref/PublicInfo/Shell_BF/SOI_ep_approval.pdf)*

EPA is hopeful that these conditions will help address the concern regarding subsistence hunting and fishing.

Also see EPA’s responses to comments in Category N and O above.

## **Category Y: Local Air Quality Concerns**

### **Comment Y-1: Air Quality in Nuiqsut**

#### **COMMENT**

A number of comments were submitted expressing general concern with the local air quality impacts as a result of these projects. One commenter is concerned about the accumulation of discharge. He contends that there is no total discharge for Prudhoe Bay and Kuparuk Area and this project will add to total discharge of air pollutants coming to the village of Nuiqsut. Commenters suggest that EPA needs to take a closer and better look at accumulation of what is happening in the Village of Nuiqsut, or near the Village of Nuiqsut.

Another individual explains that for many years the Inupiat of the Arctic Slope or North Slope have been opposed to offshore activities such as survey exploration in the water and possible development in the future. Even knowing that this is only exploration will open doors for development. (See EPA’s response to comment, Category E)

The NSB stated that during ADNR’s April 5-6, 2007, public hearings in Nuiqsut and Kaktovik, residents expressed concern about air pollution and said air pollution from other countries was already a problem in the Arctic, emphasizing the need for appropriate baseline ambient air pollution data gathering to understand the true background pollutant levels before embarking on adding more pollution to the air shed. Residents also expressed concern about the yellow haze west toward Prudhoe Bay, Alpine and other developed areas and wonder if Shell’s operations will make that worse.

The NSB explains that the operations proposed by Shell will produce substantial air pollution, close to population centers such as Kaktovik, and within very commonly used subsistence corridors. The NSB informed EPA that the impact of air pollution in the arctic is much more significant than in a more temperate region, because the arctic is subject to extreme atmospheric inversions. These inversions result in the pollution being trapped in a mixing layer only a few feet above the surface. The NSB believes that health impacts are thus likely to be much more substantial in the Beaufort Seas even at much lower levels of pollution than urban areas. Public concern was expressed about the existing air quality in Nuiqsut and the potential impact the project would have in the future.

### **EPA RESPONSE**

EPA shares the commenters' concerns with the air quality and understands individuals' expressed concerns about the air quality in their communities. Criteria pollutants are those pollutants for which EPA has established NAAQS. Primary NAAQS set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. EPA believes that the project will not have an adverse impact on public health.

The maximum projected air quality impacts of the proposed project combined with background air quality (ambient air quality measurements assumed to be representative of the existing air quality in the project area due to general industrial development on the North Slope) are less than NAAQS. Project impacts on air quality in or near the Village of Nuiqsut will be less than the project's maximum impacts. Thus, the proposed project is not expected to cause or contribute to a violation of the health-related air quality standards. Since this project will not cause or contribute to a NAAQS violation and since NAAQS are established to protect public health, the project will not have an adverse impact upon public health.

It is possible that other air pollution sources within the Village of Nuiqsut are causing local air quality impacts that are high relative to NAAQS, and that these impacts are not characterized in the air quality measurements employed for background air quality. However, these potential impacts are not related to Shell's project and therefore, are not considered in the air quality analysis for the proposed project.

### **COMMENT**

An individual explained they can always see smoke from the oil industry located nearby.

### **EPA RESPONSE**

For concerns regarding the existing air quality in the Village of Nuiqsut, commenters are encouraged to contact the ADEC to request air quality monitoring in Nuiqsut to determine if the air quality exceeds health standards. Commenters are also able to report specific complaints or concerns regarding air quality to ADEC. Additionally you can

report complaints to EPA online at  
<http://www.epa.gov/compliance/complaints/index.html>

Shell has demonstrated to EPA's satisfaction that its exploration activities will not cause or contribute to a Primary NAAQS violation.

**Shell Kulluk's Impacts vs. Primary NAAQS**

Air Pollutant	Averaging Period	Shell (µg/m <sup>3</sup> )	Existing (µg/m <sup>3</sup> )	Total (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )	Percent NAAQS
SO <sub>2</sub>	3-Hour	461.0	9.8	470.8	1300	36
	24-Hour	204.9	7.2	212.1	365	58
	Annual	6.7	2.6	9.3	80	12
NO <sub>2</sub>	Annual	64.7	3.0	67.7	100	68
PM <sub>10</sub>	24-Hour	103.2	7.9	111.1	150	74
	Annual	3.4	1.8	5.2	50	10

Maximum 1-hour: SO<sub>2</sub> = 512.2 µg/m<sup>3</sup> ; NO<sub>2</sub> = 6554.2 µg/m<sup>3</sup>, and PM<sub>10</sub> = 258.1 µg/m<sup>3</sup>

**Frontier Discoverer's Impacts vs. Primary NAAQS**

Air Pollutant	Averaging Period	SOI (µg/m <sup>3</sup> )	Existing (µg/m <sup>3</sup> )	Total (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )	Percent NAAQS
SO <sub>2</sub>	3-Hour	219.7	9.8	229.5	1300	18
	24-Hour	97.6	7.2	104.8	365	29
	Annual	2.4	2.6	5.0	80	6
NO <sub>2</sub>	Annual	22.7	3.0	25.7	100	26
PM <sub>10</sub>	24-Hour	84.2	7.9	92.1	150	61
	Annual	2.1	1.8	3.9	50	8

Maximum 1-hour: SO<sub>2</sub> = 244.1 µg/m<sup>3</sup> ; NO<sub>x</sub> = 3070.2 µg/m<sup>3</sup>, and PM<sub>10</sub> = 210.6 µg/m<sup>3</sup>

**Category Z: Health Impacts**

**Comment Z-1: Health Impacts in Nuiqsut**

**COMMENT**

### **NSB Attachment 1, Pgs. 15-17**

The NSB, environmental groups and individual commenters submitted numerous comments regarding Environmental Justice concerns. Specifically, commenters explain that communities of Alaska's North Slope have long used the marine resources of the Beaufort Sea for both subsistence practices and cultural identity. They express concern about EPA's disregard for environmental justice and subsistence rights for Alaska Native residents, failure to adequately conduct government-to-government consultation, and failure to consider major impacts to the human and natural environment.

In their comments the NSB explains that after more than 30 years of gradually expanding oil and gas development, North Slope residents have grown increasingly concerned about the impacts of oil and gas activities on every aspect of their health and well-being, and about the lack of attention to this issue in regulatory and permitting decisions. According to the NSB, residents of Nuiqsut have testified to marked increases in pulmonary disease since the onset of operations at the Alpine Central Processing Facility. In spite of their testimony, regulatory decisions are still based on scant data and models which have not been validated under Arctic conditions, with no monitoring data whatsoever available for some of the most concerning pollutants – namely PM<sub>2.5</sub> and the HAPs commonly associated with oil and gas operations.

The NSB provided documentation regarding the overall mortality rates and increasing chronic pulmonary disease mortality rates, high cancer incidence and mortality rates among North Slope Alaska Natives. It noted that many health professionals working in our region have noted that the North Slope community appears particularly vulnerable to respiratory infections. The NSB emphasized that it is in this context – that of a community with substantial health disparities and baseline vulnerability – that the significance of Shell's plan must be evaluated. The NSB asked EPA to evaluate Shell's proposed permit request with a strong emphasis on the principles and requirements of Environmental Justice. Although seeking to avoid a "major source" designation may be expeditious for Shell from a business perspective, it is a flagrant and grievous violation of the principles of environmental justice. Given the already distressing increases and alarmingly high rates of pulmonary disease and cancer, the North Slope population warrants a particularly cautious regulatory approach to prevent further incremental degradation of our health.

The NSB maintains that the EPA should recognize that the North Slope Inupiat population has particular vulnerabilities due to both their dependence on subsistence activities and wild foods, and due to the substantial baseline health disparities between their population and the general U.S. population.

Finally, the NSB commented as to what may in the end be among the most significant impacts of actions which appear to us to show a deep disregard for Alaskan Native health. The NSB identified that stress, fear and tension caused by multiple, simultaneous, and increasingly frequent proposals for development in the heart of the subsistence region

are in and of themselves among the most difficult health problems we face, made worse by regulatory decisions that appear to value industry convenience over the well-being of our communities. The NSB stated that these effects and the tension and emotion caused by this proposed permitting decision were made crystal clear in the public meeting and hearing conducted by EPA in Nuiqsut, May 8. Rates of suicide, domestic violence, and other social pathology are epidemic on the North Slope. The NSB maintains that it is precisely the type of concern represented by this permit application – that of actions that threaten not only to directly harm our health but to contaminate our subsistence resources as well – that leads to feelings of desperation, anxiety, helplessness, and anger among our residents. Sincere efforts by regulators to protect our health would go a long way toward preventing this problem.

One commenter stated that health effects in the Village of Nuiqsut is increasing as evidenced by increased calls to the clinic, increased supply costs, increase transportation, costs and costs to families and village structures. It was also mentioned to EPA that there is a high incidence of respiratory problems, hypertension, hypersensitivity, heart disease, diabetes, thyroid disease, chemical sensitivities, asthma, upper respiratory, bronchitis, pneumonia, emphysema. The commenter noted that they are concerned about leukemia and cancer. EPA was informed that villages are experiencing increased social ills, increased domestic violence, and increased drugs and alcohol use. The commenter stated that all of these health concerns result in an increase in childhood health and a decrease in elder preservation which impacts community health and vitality.

The NSB stated that during ADNR's April 5-6, 2007, public hearings in Nuiqsut and Kaktovik, residents expressed concern increased human health and respiratory issues associated with air pollution as a "big problem" (families of asthma victims versus a time of very few asthma cases) and called for human health assessments to protect residents from the human health impacts of industrial air pollution. The NSB continues to say that many people testified about the psychological effects on residents of stress and loss of cultural identity, as well as health concerns from air, terrestrial and water pollution from discharges and contaminants associated with industry practice.

## **EPA RESPONSE**

[Refer to EPA response to comments, Categories N and Y](#)

## **Category AA: Request for Monitoring in Nuiqsut**

### **Comment AA-1: Air Quality Monitoring in Nuiqsut**

#### **COMMENT**

Direct Implementation Tribal Cooperative Agreement (DITCA) is a program that is provided in the lower 48 for Tribes to address and monitor air quality. One commenter

requested for EPA to start this program that allows Tribes to train local people and purchase air monitoring equipment to be used in Nuiqsut.

### **EPA RESPONSE**

This document is not the appropriate context for which to respond to this comment. However, Keith Rose of EPA is available to discuss funding mechanisms to enable ambient air pollutant monitoring. Keith may be contacted at (206) 553-1949 or at [rose.keith@epa.gov](mailto:rose.keith@epa.gov).

### **Conclusion**

Based on our review of the application, supporting materials and the comments received, EPA finds that the NAAQS and other applicable requirements will not be exceeded as a result of this project. None of the issues raised by the commenters present a sound basis to deny permit issuance. In light of these findings, EPA grants approval to conduct exploratory drilling in the Beaufort Sea, Alaska, as requested by Shell. This approval is subject to the terms and conditions set for the Air Quality Control Minor Permits Nos. R10OCS-AK-07-01 and R10OCS-AK-07-02.