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March 22, 2010

Via Electronic Mail

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Re: Comment Letter Regarding Shell Gulf of Mexico/Shell Offshore Inc.'s OCS Pre-Construction Air Permit Application for the Beaufort Sea Exploration Program, the Draft Permit, and EPA's Statement of Basis for the Draft Permit.

Dear Ms. Helm and Ms. Greaves:

Thank you for the opportunity to comment on Shell's Beaufort Sea Clean Air Act (CAA) proposed permit application, and the Environmental Protection Agency's (EPA's) proposed permit and statement of basis for that permit. Because of our continuing and unified interest in minimizing the impacts of air pollution and climate change in our Arctic communities and surrounding environment these comments are submitted jointly on behalf of the Alaska Eskimo Whaling Commission (AEWC), the Inupiat Community of the Arctic Slope (ICAS), and the North Slope Borough (NSB).

At the outset, we wish to express our sincere thanks to EPA for visiting the North Slope and discussing this proposed permit with representatives from our organizations. We acknowledge EPA's efforts to draft a comprehensive permit within a very limited time frame and recognize the immense pressure EPA has been under to finalize this permitting process. We are encouraged by your efforts and submit these comments to assist you in your review of Shell's proposed action. We hope that you will permit the proposed emissions only when their impact to the health and welfare of our people is minimized to the greatest extent possible.

As you know, AEWC is a non-profit organization representing Inupiat whaling captains in the eleven bowhead whale subsistence hunting villages of Barrow, Nuiqsut, Kaktovik, Pt. Hope, Kivalina, Wales, Savoonga, Gambell, Little Diomedea, Wainwright, and Pt. Lay. Our

whaling captains and their communities rely upon the health of Camden Bay and its surrounding waters

to provide for marine life, which in turn sustain our people and our culture. AEWK is responsible for safeguarding the hunt of the bowhead whale and the subsistence way of life that Arctic waters support. AEWK's Inupiat and Siberian Yupik whaling captains have thousands of years of traditional knowledge about the Arctic ecosystem, and AEWK is also well versed in the current science regarding the health and status of the natural resources of the Arctic.

ICAS is a regional tribal government for eight villages on the North Slope that depend upon the marine mammals living in and migrating through Arctic waters. The Beaufort Sea is a unique and diverse marine environment with great cultural significance for the Inupiat people who hunt and fish in this area. We have previously experienced oil and gas activities in the Arctic that caused direct conflicts with subsistence activities and the resources that have sustained the Inupiat for thousands of years. Because offshore oil and gas activities pose risks to Inupiat subsistence activities and cultural preservation, they require careful review.

The NSB has the largest territorial and coastal jurisdiction of any municipal government in the United States, an area that is larger than the State of Minnesota. The NSB has multiple interests at stake in Shell's proposed Camden Bay Exploration Plan underlying this CAA permit. First and foremost are the NSB's interests related to the health and welfare of our residents, who are rightfully concerned about potential health impacts associated with oil and gas development on the North Slope. These impacts may be direct, indirect or cumulative in nature and relate to the contamination and degradation of the natural environment upon which our residents rely.

Our communities that will be impacted by Shell's proposal include those that are onshore from Shell's proposed operations, in particular Nuiqsut and Kaktovik, and also those that rely upon the resources from the Beaufort Sea. Shell's proposed air emissions pose risks to all these communities. Emissions from the ocean-going vessels that Shell is proposing to use include major contributors to global climate change, such as carbon dioxide (CO₂), and pollutants harmful to human health, such as nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter (PM).¹ EPA has recognized that

in 2001 marine diesel engines with per-cylinder displacement of 30 liters or more (a group roughly corresponding to the engines covered by the new IMO [International Maritime Organization] standards) contributed 6% of the NO_x coming from all mobile sources in the U.S., as well as 10% of the PM, and 40% of the SO_x. We further estimate that without new emission controls,

¹ The International Council on Clean Transportation, Air Pollution and Greenhouse Gas Emissions from Ocean-going Ships: Impacts, Mitigation Options and Opportunities for Managing Growth (2007) (available at: http://www.theicct.org/documents/MarineES_Final_Web.pdf).

these contributions would have increased by 2030 to 34% of the NO_x coming from all mobile sources in the U.S., 45% of the PM, and 94% of the SO_x.²

We are rightfully concerned about the ramifications of these emissions and the overall action as proposed, given the significance of its potential and disproportionate impacts on our people.

The people who will be affected by Shell's air emissions live in isolated areas, depend on a lifestyle and diet that is radically different from other U.S. populations, have markedly higher rates of pulmonary disease than the general U.S. population, and may have genetic predispositions to disease that differ from other U.S. populations. As abundant public health data has demonstrated, our people are substantially more vulnerable to morbidity and mortality from air pollution than are other Americans. A human health impact assessment, more thorough ambient air modeling and baseline emission assessments are needed to assure that human health is protected.

We commend Shell for recognizing the need and providing for the use of ultra low sulfur fuel to reduce emission in all of the 2010 exploration fleet. But, as demonstrated in the attached comments, the proposed emissions are still significant. We have identified a number of areas where the proposed permit needs revision to conform to CAA and its regulations. These areas include:

1. The need for EPA to regulate the CO₂ emissions from Shell's proposed operations;
2. The need for Shell to comply with the new NAAQS for NO₂;
3. The need for Shell to comply with the new PSD increments for PM_{2.5};
4. The need for the Final Permits to only encompass those activities for which Shell is currently seeking authorization for under OCSLA;
5. The need to apply BACT and the corresponding on shore regulations to all the vessels and engines associated with Shell's proposed activities at the drill site;
6. The need to more thoroughly apply BACT to those vessels and engines that are currently being regulated; and
7. The need to comply with several other environmental laws before a permit is issued to Shell.

Until these areas of concern are resolved, we ask that a permit not be issued for the proposed

² EPA, Program Announcement: International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels (2008) (available at: <http://www.epa.gov/oms/regs/nonroad/marine/ci/420f08033.pdf>).

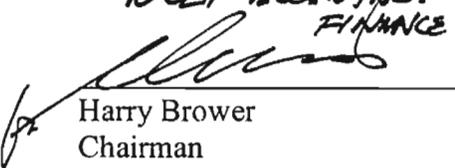
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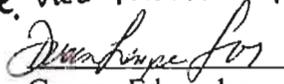
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offshore oil and gas exploration emissions. There are demonstrated and required means to considerably reduce the air emissions associated with this action. These means should be implemented to assure compliance with federal law, and most importantly, to avoid unnecessary impacts to the health and welfare of our people.

Thank you again for the opportunity to comment. Please feel free to contact us if you have questions regarding these comments.

NOLI MCINTYRE
FINANCE OFF.

Harry Brower
Chairman
AK. Eskimo Whaling Commission

Sincerely,
DOREEN LAMPE
VICE PRESIDENT, ICAS

George Edwardson
President
ICAS


Edward S. Itta
Mayor
North Slope Borough

cc: sent via first class or electronic mail

Senator Lisa Murkowski
Senator Mark Begich
Representative Don Young
Richard Albright, EPA, Region 10
Pat Nair, EPA, Region 10
Jeffrey Walker, Minerals Management Service
Andy Mack, NSB Mayor's Office
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Bessie O'Rourke, NSB Attorney
Taulik Hepa, NSB Director, Wildlife Management
Dan Forster, NSB Director, Planning

AEWC, ICAS, AND NORTH SLOPE BOROUGH'S COMMENTS REGARDING SHELL GULF OF MEXICO AND SHELL OFFSHORE INC.'S APPLICATION FOR AN OCS PSD PERMIT UNDER THE CLEAN AIR ACT.

These unified comments are submitted jointly on behalf of the Alaska Eskimo Whaling Commission (AEWC), the Inupiat Community of the Arctic Slope (ICAS), and the North Slope Borough (NSB), who hereafter will collectively be referred to as "NSB."

STATUTORY AND FACTUAL BACKGROUND.

Statutory Background.

The prevention of significant deterioration (PSD) program was added to the Clean Air Act (CAA) in 1977. The PSD program helps ensure that national ambient air quality standards (NAAQS) are attained. It requires new major stationary sources to obtain preconstruction permits in areas where the NAAQS have been attained (attainment areas).¹ In 1990, Congress decided to regulate air pollution in the Outer Continental Shelf (OCS) by amending the CAA to include the OCS program which regulates offshore entities by requiring them "to attain and maintain Federal and State ambient air quality standards and to comply with the" PSD program.² EPA has promulgated regulations to control air pollution on the outer continental shelf (OCS) for this purpose.³

Under the PSD program, if an OCS source is located 25 miles beyond a state's seaward boundary that source is "subject to the New Source Performance Standards (NSPS), in 40 C.F.R Part 60."⁴ If the OCS source qualifies as "a major stationary source," then the standards promulgated under Section 112 of the CAA (the National Emissions Standards for Hazardous Air Pollutants or NESHAPs) apply to the source.⁵ The potential for the OCS source to emit New Source Review (NSR) pollutants⁶ must be calculated and the OCS source must apply for a CAA Title V operating permit.⁷

¹ 42 U.S.C. § 7475.

² 42 U.S.C. § 7627(a)(1).

³ See 40 C.F.R. part 55.

⁴ EPA, Region 10, Statement of Basis for Proposed Outer Continental Shelf Prevention of Deterioration Permit No. R10OCS/PSD-AK-2010-01 Shell Gulf of Mexico Inc. Frontier Discoverer Drillship Beaufort Sea Exploration Drilling Program at 18 (Feb. 17, 2010) (hereafter "EPA Stmt of Basis"); see also 42 U.S.C. § 7627(a)(1) (EPA "shall establish requirements to control air pollution from Outer Continental Shelf sources located offshore of the States . . . to attain and maintain Federal and State ambient air quality standards and to comply with the provisions of part C of subchapter I of this chapter").

⁵ *Id.* (internal citations omitted).

⁶ Here the relevant NSR pollutants are CO, NO_x, PM, PM_{2.5}, PM₁₀, SO₂, VOC, and CO₂.

⁷ See 40 C.F.R. § 71.5(a)(1)(i).

If an OCS source is located within 25 miles of a state's seaward boundary, the same requirements for sources located in the "corresponding onshore area" (COA) apply.⁸ As the COA requirements are subject to change, EPA is required to update the OCS regulations as necessary to remain consistent with the applicable COA requirements.⁹ EPA most recently updated the OCS regulations on January 21, 2010 to reflect the current COA requirements in Alaska.¹⁰

The "PSD program includes a requirement" that the permit applicant evaluate "the effect that the proposed emissions are expected to have on air quality related values such as visibility, soils, and vegetation."¹¹ Before issuing a PSD permit to a major new stationary source, EPA must conduct a Best Available Control Technology (BACT) analysis for each pollutant that the source has the potential to emit in significant quantities.¹²

Factual Background.

Compared to many areas in the United States, the communities along the North Slope of Alaska have fewer combustion sources. While these communities are recipients of air pollution from other areas, they are still relatively pristine. Shell has proposed a large oil and gas exploration undertaking involving a drill ship, a fleet of support vessels including two ice breakers and aircraft traveling to and across the Arctic Ocean from July through October. Among the other known impacts associated with this action, the exploration activities will emit tons of health harming and climate changing pollutants into the air.

Prior oil and gas operations have impacted air quality on the North Slope. As EPA has noted, "[o]zone levels" and the levels of "ozone precursors (i.e., NO_x and VOC)" in areas where "oil and gas operations are currently located" are "higher than the levels that have been collected at the Wainwright monitoring site."¹³ Thus, demonstrating the impacts such operations can have.

Shell is proposing "to operate the Discoverer drillship and associated fleet in the Beaufort Sea" and seeks "a major source permit to authorize mobilization and operation of the [] Discoverer [] and its Associated Fleet at" one or more of Shell's leases that it obtained during Lease Sale 195 and 202.¹⁴ Shell is proposing a "maximum of 168 drilling days

⁸ EPA Stmt of Basis at 18, citing 42 U.S.C. § 7627(a)(1).

⁹ *Id.*

¹⁰ EPA Stmt of Basis at 18, citing 75 Fed. Reg. 3392.

¹¹ EPA Stmt of Basis at 20.

¹² 42 U.S.C. § 7475(a)(4).

¹³ EPA, Region 10, Statement of Basis for Proposed Outer Continental Shelf Prevention of Deterioration Permit No. R10OCS/PSD-AK-09-01 Shell Gulf of Mexico Inc. Frontier Discoverer Drillship Chukchi Sea Exploration Drilling Program at 76 (Aug. 14 2009).

¹⁴ EPA, Region 10, Statement of Basis for proposed Outer Continental Shelf Prevention of Deterioration Permit No. R10OCS/PSD-AK-09-01, Shell Gulf of Mexico Inc. Frontier Discoverer Drillship Chukchi Sea Exploration Drilling Program at 10 (January 8, 2010) (hereafter "EPA Re-Proposed Stmt of Basis").

(5.5 months), beginning in July of each year” and “[d]rilling is planned to begin no earlier than July of 2010 and continue seasonally (i.e. July to December each year) until the resources under Shell’s current leases are adequately defined.”¹⁵

Shell has proposed to drill two wells in the vicinity of Camden Bay in the Beaufort Sea and --during the same timeframe--up to three wells in the Chukchi Sea. Shell owns many more leases in nearby areas, where future exploratory drilling will likely occur. Thus, the overall, cumulative impacts of Shell’s proposed and likely future operations on the air quality of the North Slope must be accounted for.

I. EPA Needs To Address Carbon Dioxide And Other Greenhouse Gas Emissions In The Draft Permit.

Before issuing a PSD permit, the Clean Air Act requires that the EPA conduct a BACT analysis and include emissions limitations for “each pollutant subject to regulation” under the Act.¹⁶ Carbon dioxide (CO₂) and the other greenhouse gases (GHGs) that will be emitted in significant quantities through Shell’s Beaufort Sea exploratory drilling program are pollutants under CAA,¹⁷ and therefore need to be included in a BACT analysis.

The proposed permit for Shell’s Beaufort Sea exploratory drilling program does not address carbon dioxide (CO₂) or other greenhouse gases (GHGs) to be emitted from the proposed OCS sources.

A. The Proposed Permit Would Result in Emission of Significant Amounts of CO₂ and Other Greenhouse Gases

Greenhouse gas emissions from oil and gas sources can be significant. The Arctic has already witnessed temperature increases that are twice as large as global averages and is poised to continue warming temperatures at greater levels than the rest of the world.¹⁸ The effects of global warming are acute in the Arctic where melting sea ice,¹⁹ ocean pH

¹⁵ *Id.* at 14.

¹⁶ 42 U.S.C. § 7475(a)(4).

¹⁷ *Massachusetts v. EPA*, 549 U.S. 497 (2007).

¹⁸ See International Panel on Climate Change, *Climate Change: 2007 Synthesis Report*, at 30 (available at: <http://www1.ipcc.ch/ipccreports/assessments-reports.htm>) (Attachment 1); Allen J. Parkinson et al., *Potential Impact of Climate Change on Infectious Disease in the Arctic*, 64 INT’L J. CIRCUMPOLAR HEALTH 478, 479 (2005).

¹⁹ See Elizabeth Bluemink, *Sea ice melt 3rd largest in 30 years*, ANCHORAGE DAILY NEWS (Sep. 17, 2009) available at <http://www.adn.com/2009/09/17/939372/sea-ice-melt-3rd-largest-in-30.html>; see also *Arctic Marine Shipping Assessment 2009 Report*, Arctic Council p. 26 available at <http://web.arcticportal.org/en/pame/amsa-2009-report> (reporting that the five smallest September ice-covered areas for the Arctic Ocean during the modern satellite record (1979-2008) have occurred in the five most recent seasons (2004-2008)).

levels are changing,²⁰ and increased flooding and erosion²¹ threaten local species and coastal communities. In the Exploration Plan for the Chukchi exploration, Shell noted that the US Fish and Wildlife Service has recognized that climate change threatens the survival of marine mammals who depend upon sea ice.²² Reducing greenhouse gas emissions is imperative to slowing and stopping these dramatic events from further harming the people and ecosystem of the Arctic.²³

The Discoverer drillship would add an estimated 20,000 tons of CO₂ emissions to the air each year and about 60,000 tons per year from the Discoverer and its support vessels.²⁴ The fleet's total annual CO₂ emissions would be akin to the annual CO₂ emissions from 11,000 cars.²⁵

²⁰ See Dan Joling, *Acidity in Alaska ocean waters puts fisheries at risk*, ANCHORAGE DAILY NEWS (Aug. 24, 2009) available at <http://www.adn.com/2009/08/24/909455/acidity-in-alaska-ocean-waters.html>; Carin Stephens, *New findings show increased ocean acidification in Alaska waters*, UAF Newsroom (Aug. 12, 2009) available at <http://www.uaf.edu/news/headlines/20090811160143.html>.

²¹ See Rachel D'Oro, *Eroding village appeals suit dismissal*, ALASKA DAILY NEWS (Jan. 29, 2010) available at <http://www.adn.com/2010/01/28/1115618/eroding-village-appeals-suit-dismissal.html>; Henry Huntington and Shari Fox, *The Changing Arctic: Indigenous Perspectives* p. 76, Chapter 3 in *Impact of a Warming Arctic: Arctic Climate Impact Assessment* (2004) available at <http://www.acia.uaf.edu/pages/scientific.html>; *Alaska Native Villages, Most Are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance*, U.S. General Accounting Office Report to Congressional Committees, No. GAO-04-142 (2003) p. 3 available at <http://gao.gov/new.items/d04142.pdf>; *Draft Final Climate Change and Health Impacts Point Hope*, Alaska Center for Climate and Health Alaska Native Tribal Health Consortium (2009) at 22 available at <http://www.anthc.org/chs/ces/climate/upload/Point-Hope-CCHIA-Draft-Final.pdf>.

²² Shell, Environmental Impact Assessment, Camden Bay Exploration Plan at 136, 138 (May 2009) (“Shell’s Camden Bay EIA”).

²³ Shell states that the proposed CO₂ emissions represent an “extremely small amount” of global greenhouse gases and thus the cumulative effects are insubstantial. Shell Camden Bay EIA at 203. However, this position ignores the importance of incremental regulatory steps toward redressing harms caused by global warming. In *Massachusetts v. EPA*, the Supreme Court rejected the argument that mobile source emissions were such an insignificant amount of global greenhouse gases that regulation of those emissions could not redress the petitioners' injury from global warming because of the importance of incremental steps. 549 U.S. at 524-525.

²⁴ OCS EIS/EA MMS 2009-052 Environmental Assessment, Shell Offshore Inc., 2010 Outer Continental Shelf Lease Exploration Plan, Camden Bay, Alaska, Beaufort Sea Leases OCS-Y-1805 and 1941, p. 65. Available online at http://www.mms.gov/alaska/ref/EIS%20EA/mms2009_052_ea/2009_1015_EA.

²⁵ Based on fuel economy numbers from EPA MOBILE6.2 (EPA’s computer model for estimating emissions for highway vehicles), an average passenger vehicle emits approximately 5 metric tons of CO₂ equivalent per year. “Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle”, EPA420-F-05-004 February 2005 (available at: <http://www.epa.gov/otaq/climate/420f05004.htm>) (Attachment 2).

The significant cumulative impacts of marine diesel engines (including those employed by Shell) on air quality are now internationally recognized.²⁶ In 2008, the 168 Member States of the International Maritime Organization (IMO) adopted stringent new standards to control harmful exhaust emissions from these engines.²⁷ In 2009, EPA adopted these standards.²⁸

Methane (CH₄) emissions will result from vented sources during Shell's exploration drilling program. Methane is of particular concern as a greenhouse gas since it is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide over the same 100-year period.²⁹ In fact, the CO₂ and CH₄ emissions from Shell's exploratory operations are hardly insignificant when considering the grave impacts to the Arctic Region from changes to the climate.

Recent research on the effects of black carbon on climate change indicate that the pollutant -- a product of fossil fuel combustion -- may have significant impacts on climate change, especially in the Arctic region.³⁰ A portion of the PM_{2.5} emissions from both the Beaufort Sea and Chukchi Sea exploration activities are made up of black carbon emissions (from diesel fuel combustion). According to EPA, there is sufficient evidence to support the reduction of black carbon emissions as a means to slow the rate of warming in the Arctic over the next few decades.³¹

EPA must regulate these significant CO₂ emissions from Shell's operations. In Alaska, the oil and gas industry emits 15 million tons of CO₂ emissions each year.³² By conducting CO₂ and GHG BACT analyses for Alaskan oil and gas sources that emit PSD thresholds of CO₂ and other GHGs, the agency could reduce a significant amount of these pollutants that are emitted.

²⁶ EPA, Program Announcement: International Maritime Organization Adopts Program to Control Air Emissions from Ocean-going Vessels (2008) (available at: <http://www.epa.gov/nonroad/marine/ci/420f08033.htm>) (Attachment 3).

²⁷ *Id.*

²⁸ EPA, Program Announcement: EPA Finalizes More Stringent Standards for Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder: Regulatory Announcement (2009) (available at: <http://www.epa.gov/nonroad/marine/ci/420f09068.htm>)

²⁹ EPA Methane Information (available at: <http://www.epa.gov/methane/index.html>) (Attachment 4) ("Methane is of particular concern as a greenhouse gas since it is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide over the same 100-year period.").

³⁰ See, e.g., *Arctic Marine Shipping Assessment 2009 Report*, Arctic Council at 5 (available at: <http://web.arcticportal.org/en/pame/amsa-2009-report>).

³¹ M. Sarofim et al. Current Policies, Emission Trends and Mitigation Options for Black Carbon in the Arctic Region, Draft White Paper, U.S. EPA and others, April 28, 2009, available at <http://iiasa.ac.at/rains/reports/DRAFTWhitePaper-BCArcticMitigation-280909.pdf>

³² Shell Camden Bay EIA at 65.

B. Greenhouse Gases are Pollutants Subject to Regulation Under the CAA and Therefore Must be Included in Shell's Permit.

As EPA has recently recognized, CO₂ and other greenhouse gases clearly fall within the Clean Air Act's definition of "air pollutant." The CAA defines "air pollutant" to include "any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air."³³ Further, the CAA specifically includes carbon dioxide in a list of "air pollutants." Section 103(g) of the CAA directs EPA to conduct a research program concerning "[i]mprovements in nonregulatory strategies and technologies for preventing or reducing multiple air pollutants, including . . . *carbon dioxide*, from stationary sources, including fossil fuel power plants."³⁴

EPA is required to regulate emissions of air pollutants, including carbon dioxide, under a number of the Clean Air Act's major substantive provisions, when, in EPA's judgment, such emissions cause or contribute to air pollution which "may reasonably be anticipated to endanger public health or welfare."³⁵ Examples include: section 111 establishing new source performance standards for categories of stationary sources; and section 202 establishing standards for emissions from new motor vehicles. EPA requires that major sources monitor, record, and report emissions of CO₂ pursuant to section 821 of the CAA.³⁶ Further, the Act's definition of "welfare," specifically includes effects on "climate" and "weather."³⁷ Section 165(a)(2) of the CAA provides that a major emitting facility is "subject to the best available control technology for each pollutant subject to regulation under [the Clean Air Act] emitted from, or which results from, such facility."³⁸

Section 165(a)(2) of the CAA provides that a major emitting facility is "subject to the best available control technology for each pollutant subject to regulation under [the Clean Air Act] emitted from, or which results from, such facility."³⁹ EPA has taken several actions that indicate carbon dioxide and other greenhouse gases are subject to regulation under the Act, i.e., promulgating monitoring and reporting requirements and approving a state implementation plan that regulates carbon dioxide.⁴⁰

³³ 42 U.S.C. § 7602(g) (emphasis added).

³⁴ 42 U.S.C. § 7403(g)(1) (emphasis added).

³⁵ 42 U. S. C. § 7521(a)(1).

³⁶ See, 40 C.F.R. § 75. Section 821 of Pub.L. 101-549 stated that: "(a) Monitoring.--The Administrator of the Environmental Protection Agency shall promulgate regulations within 18 months after the enactment of the Clean Air Act Amendments of 1990 to require that all affected sources subject to Title V of the Clean Air Act shall also monitor carbon dioxide emissions according to the same timetable as in section 511(b) and (c).

³⁷ 42 U.S.C. § 7602(h).

³⁸ 42 U.S.C. § 7475(a)(2).

³⁹ 42 U.S.C. § 7475(a)(2).

⁴⁰ See Prevention of Significant Deterioration (PSD): Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program, 74 Fed. Reg. 51535, 51538 (to be

EPA has recognized the need for regulation of greenhouse gas emissions announcing on September 30, 2009 a proposal requiring large industrial facilities that emit at least 25,000 tons of greenhouse gases a year to obtain construction and operating permits covering these emissions.⁴¹ These permits must demonstrate the use of best available control technologies and energy efficiency measures to minimize greenhouse gas emissions. EPA has also finalized a rule to require mandatory reporting of greenhouse gas emissions, such as carbon dioxide, from “large sources” in the United States.⁴² Under the rule, EPA proposes to require facilities that emit 25,000 metric tons or more per year of greenhouse gas emissions to submit annual reports to EPA. These reporting standards should apply to the current proposal because Shell is proposing to emit a total of almost 60,000 tons of CO₂ per year.⁴³

Recently, the Environmental Appeals Board (EAB) remanded two PSD permits where the permitting agencies failed to articulate a rationale basis for not conducting a BACT analysis for CO₂.⁴⁴ In both *Deseret* and *Northern Michigan*, the EAB determined that the permitting authorities had not provided sufficient information in the administrative record as to why a BACT analysis was not required for CO₂. In doing so, the EAB rejected the permitting authorities’ arguments as to why CO₂ is not subject to regulation.

In *Deseret*, EPA Region 8 argued it was constrained by the historical agency interpretation that "subject to regulation" meant a pollutant had an actual emission limitation or control, which were not present in section 821's monitoring and reporting requirements. Region 8 also argued that section 821 is not actually part of the CAA because it was not written into the U.S. Code.⁴⁵ The EAB flatly rejected Region 8's argument, stating it was at odds with the agency's prior stance on section 821. In doing so, the EAB suggested that CO₂ is subject to regulation under section 821:

codified at 40 C.F.R. pt. 52) (October 7, 2009) (discussing petitioners' arguments for why carbon dioxide is subject to regulation)

⁴¹ See Fact Sheet -- Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (available at: <http://www.epa.gov/NSR/fs20090930action.html>) (Attachment 5).

⁴² See Background information on the Proposed Mandatory GHG Reporting Rule (available at: <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>) (Attachment 6).

⁴³ OCS EIS/EA MMS 2009-052 Environmental Assessment, Shell Offshore Inc., 2010 Outer Continental Shelf Lease Exploration Plan, Camden Bay, Alaska, Beaufort Sea Leases OCS-Y-1805 and 1941, p. 65. Available online at http://www.mms.gov/alaska/ref/EIS%20EA/mms2009_052_ea/2009_1015_EA.

⁴⁴ See *In re: Deseret Power Electric Cooperative*, PSD Appeal No. 07-03, 14 E.A.D. --- (Nov. 13, 2008); *In re: Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, 14 E.A.D. --- (Feb. 18, 2009).

⁴⁵ EPA is reconsidering its interpretation of this provision, see PSD: Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by the Federal PSD Permit Program, 74 Fed. Reg. 51535-51549 (Oct. 7, 2009).

the preamble as a whole augers in favor of a finding that the Agency expressly interpreted 'subject to regulation under this Act' to mean 'any pollutant regulated in Subchapter C of Title 40 of the Code of Federal Regulations for any source type.'⁴⁶

The permitting agencies in *Deseret* and *Northern Michigan* could not provide an adequate explanation why CO₂ is not subject to regulation because there simply is not one. Between section 821 of the CAA and Delaware's emissions limitations on electrical generators, CO₂ is definitively regulated under the CAA and must be subject to a case-by-case BACT analysis for new sources that will emit the pollutant in significant amounts. In the absence of a BACT analysis for Shell's operations, the EPA must provide a legally defensible justification as to why CO₂ is not subject to regulation under the Act.

C. Shell's Permit Must Require BACT for the CO₂ Emissions To Remain in Line with EPA's Proposed Regulatory Changes.

On December 15, 2009, EPA formally announced that greenhouse gases "endanger both the public health and the public welfare of current and future generations."⁴⁷ Although EPA's endangerment findings were promulgated under Clean Air Act section 202(a), which deals with transportation sources, the agency's findings were clear: human activities are increasing the concentrations of greenhouse gases in our atmosphere and are contributing to global climate change, which "may reasonably be anticipated both to endanger public health and to endanger public welfare."⁴⁸ In reaching this conclusion, the agency relied upon evidence that demonstrated greenhouse gases pose a risk to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy infrastructure, settlements, and ecosystems and wildlife.

As a result of this finding, EPA will be issuing regulations that control CO₂ emissions. It is likely that EPA will finalize the light-duty vehicle rule by the end of March 2010.⁴⁹ Once this rule is finalized, there will be no argument that greenhouse gases are not subject to regulation under the Clean Air Act, and the PSD permitting requirements will

⁴⁶ *In re: Deseret Power Electric Cooperative*, PSD Appeal No. 07-03, Slip Op. at 3.

⁴⁷ 74 Fed. Reg. 66496 (2009) (to be codified at 40 C.F.R. ch. I) (Dec. 15, 2009) *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66497 (Dec. 15, 2009) ("Pursuant to CAA section 202(a), the Administrator finds that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare. Specifically, the Administrator is defining the 'air pollution' referred to in CAA section 202(a) to be the mix of six long-lived and directly-emitted greenhouse gases . . .").

⁴⁸ *Id.* at 66497.

⁴⁹ Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55292, 55300 (to be codified at 40 C.F.R. pt. 51, 52, 70, and 71) (Oct. 27, 2009) ("as soon as GHGs become regulated under the light-duty motor vehicle rule, GHG emissions will be considered pollutants "subject to regulation" under the CAA and will become subject to PSD and title V requirements.")

be triggered.⁵⁰ At that point, which will almost certainly be before EPA finalizes Shell's permit, Shell's operations will be subject to BACT for greenhouse gases.

EPA has recognized that the promulgation of the light-duty vehicle rule will require PSD facilities to regulate GHGs, so the agency has developed temporary applicability thresholds at 25,000 tons per year.⁵¹ Because Shell's operations will emit greenhouse gases in excess of the proposed tailoring threshold,⁵² we request that the permit include BACT for these greenhouse gases. This step is necessary to protect the marine life and habitat that has supported North Slope communities since time immemorial.

This would not be the first permit to include a BACT analysis for CO₂. A combined petroleum refinery and IGCC power plant completed a CO₂ BACT analysis for its permit.⁵³ This analysis was performed *almost a year ago* in light of the rapid changes in the political, regulatory and legal framework. Certainly at this point in time, when CO₂ regulations are eminent, at the very least Shell needed to undertake a BACT analysis and delineate technologies that could be used to control its CO₂ emissions in the very likely event such measures are required.

By conducting CO₂ and GHG BACT analyses for Alaskan oil and gas sources that emit PSD thresholds of CO₂ and other GHGs, EPA could reduce a significant amount of pollution. In doing so, the EPA would take an important step toward slowing the acute effects of global warming in the Arctic.

II. Compliance With The New NAAQS For Nitrogen Dioxide Is Also Necessary.

On February 9, 2010 EPA issued a final rule to strengthen its national ambient air quality standard for nitrogen dioxide.⁵⁴ With this action EPA established a new 1-hour standard at a level of 100 parts per billion (ppb) to supplement the existing annual standard of 100 µg/m³. According to EPA's fact sheet on this regulatory action:

[t]his level defines the maximum allowable concentration anywhere in an area. It will protect against adverse health effects associated with short-

⁵⁰ *Id.* at 51545.

⁵¹ Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55292, 55305 (to be codified at 40 C.F.R. pt. 51, 52, 70, and 71) (Oct. 27, 2009 ("The first phase entails the establishment of applicability thresholds at the 25,000 tpy CO₂e levels, and significance levels at between 10,000 and 25,000 tpy CO₂e."))

⁵² See Shell Camden Bay EIA at 203 (estimating that the Discoverer will emit an estimated 25,000 tons of carbon dioxide while the Discoverer and its support vessels will emit almost 60,000 tons per year.)

⁵³ Hyperion Energy Center BACT Analysis for CO₂ (March 2009) (available at: http://www.hyperionec.com/files/HEC_CO2_BACT_Analysis.pdf) (Attachment 7)

⁵⁴ Final Rule Nitrogen Dioxide NAAQS, 75 Fed. Reg. 6474 (Feb. 9, 2010).

term exposure to NO₂, including respiratory effects that can result in admission to a hospital.⁵⁵

EPA *must* include a modeling demonstration for this new NAAQS in its final permit for Shell's Beaufort Sea operations. It is likely that the effective date of the new NAAQS will occur prior to issuance of the final permit, therefore EPA cannot ignore the imminent requirement of this very important new health-based standard.⁵⁶ EPA's NAAQS, as reported on its website, identifying an effective date for the 1-hour NO₂ NAAQS of January 22, 2010.⁵⁷

In the event that EPA issues Shell's permit prior to the effective date of the new NAAQS, EPA must still require compliance with the standard for its operations in the Beaufort Sea since the regulation will clearly be effective *before* Shell's operations begin. Shell must be able to demonstrate compliance with all requirements that are effective during its period of operation.

There is precedent for sources complying with regulatory requirements prior to final agency action. As mentioned earlier, the Hyperion Energy Center in EPA Region 8 voluntarily conducted a BACT determination for CO₂ that was completed because the source "recognize[s] adding CO₂ emissions is an important issue, on which the political, regulatory, and legal framework may be changing."⁵⁸

We would like to see Shell commit to demonstrating compliance with EPA's new 1-hour NAAQS for NO₂, prior to EPA's issuance of a final permit, in recognition of the important health protection measures that such a demonstration will provide. It is important to the residents of the NSB communities that EPA uphold the highest standards of health protection possible.

III. Compliance With The New Prevention of Significant Deterioration Increments for PM_{2.5} Is Also Necessary.

EPA is scheduled to finalize regulations under the Prevention of Significant Deterioration (PSD) program to establish new increments, significant impact levels (SILs) and a significant monitoring concentration (SMC) for PM_{2.5} in June of this year.⁵⁹ EPA has

⁵⁵ "Fact Sheet Final Revisions to the National Ambient Air Quality Standards For Nitrogen Dioxide" (available online at <http://www.epa.gov/air/nitrogenoxides/pdfs/20100122fs.pdf>) (Attachment 8).

⁵⁶ The effective date of the rule is April 12, 2010.

⁵⁷ <http://www.epa.gov/air/criteria.html>, Footnote 3: "To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010)." (Attachment 8).

⁵⁸ Hyperion Energy Center Best Available Control Technology (BACT) Analysis for Emissions of Carbon Dioxide, March 2009, at 2 (Attachment 7).

⁵⁹ Projected publication of final rule is June 2010. See <http://yosemite.epa.gov/oepi/rulegate.nsf/byRIN/2060-AO24?opendocument> (Attachment 8).

proposed a 24-hour Class II increment of 9 $\mu\text{g}/\text{m}^3$ and an annual Class II increment of 4-5 $\mu\text{g}/\text{m}^3$.⁶⁰ Predicted peak 24-hour average concentrations of $\text{PM}_{2.5}$ from Shell's proposed exploration drilling program in the Beaufort Sea are 19.2 $\mu\text{g}/\text{m}^3$.⁶¹

EPA *must* include a modeling demonstration for this new PSD increment in its final permit for Shell's Beaufort Sea operations. Shell cannot ignore the imminent requirement of this new PSD standard. In the likely event that EPA issues Shell's permit prior to the Agency's final decision on the $\text{PM}_{2.5}$ increment, EPA must still consider compliance with the increment for Shell's operations in the Beaufort Sea since the regulation will likely be effective during some portion of Shell's operations. Shell must be able to demonstrate compliance with all requirements that are effective during its period of operation.

IV. Shell's Air Quality Permits Must Be Limited To The Lease Blocks For Which Shell Will Seek Authorization To Operate Under OCSLA.

Shell's permit applications and the draft OCS permits issued by EPA are not subject to any specific well sites or time restraints. Rather, each draft permit covers a large number of blocks Shell has leased under various lease sales offered by MMS.⁶² Not including more specific terms in the draft Permits is unlawful.

The language in Clean Air Act section 328 specifically limits the definition of "OCS sources" to pollutant-emitting equipment in the OCS that is "*authorized*" under OCSLA.⁶³ OCSLA in turn requires lessees to identify the particular well sites in which it is seeking authorization to operate.⁶⁴ Therefore, Shell's OCS PSD permits must be limited to the specific well sites that Shell delineates in its exploration plans.

In the Beaufort, "Shell proposes to drill two exploration wells on these leases during the July-October 2010 open-water drilling season. One well would be drilled on each of two distinct oil and gas prospects named by Shell as "Sivulliq" (NR 06-04 Flaxman Island, block 6658, OCS-Y-1805) and "Torpedo" (NR 06-04 Flaxman Island, block 6610, OCS-

⁶⁰ 73 FR 54115, September 21, 2007.

⁶¹ EPA Stmt of Basis at 115.

⁶² EPA, Region 10, Draft OCS PSD Permit R10OCS/PSD-AK-2010-01 for Shell's Beaufort Sea Exploration Drilling Program at 1 (hereafter "EPA Draft Beaufort Permit"). As the first page of the draft permit for Shell's Beaufort operations demonstrates, Shell is seeking Clean Air Act authorization for **53 lease blocks** in lease sales 195 and 202.

⁶³ 42 U.S.C. § 7627(a)(4)(c)

⁶⁴ See *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815, 834 (9th Cir. 2008) ("OCSLA's implementing regulations require that, when evaluating exploration plans, an agency should consider information about "proposed well location and spacing." 30 C.F.R. § 250.203. Exploration plans must be "project specific" and describe the "resources, conditions, and activities" that could be affected. 30 C.F.R. § 250.227. In particular, an EP must include "[a] map showing the surface location and water depth of each proposed well and the locations of all associated drilling unit anchors." 30 C.F.R. § 250.211(b)."), *withdrawn* 559 F.3d 916, *dismissed as moot* 571 F.3d 859; see also 30 C.F.R. §§ 250.203, 250.227, 250.211(b).

Y-1941).”⁶⁵ In the Chukchi, Shell “proposes to drill exploration wells at up to three of five possible drill sites during the July-October 2010 open-water-drilling season. Three proposed drill sites (one per block) are located on three different blocks (6714, 6764, and 6912) in the Burger Prospect; one drill site is on a single block (6864) in the Crackerjack Prospect; and one drill site is on a single block (7007) in the SW Shoebill Prospect. The total number of wells that would be drilled in 2010 would depend on ice and weather conditions.”⁶⁶

The Clean Air Act does not provide the authority to issue a permit for exploration activities beyond those that Shell is seeking authorization for under OCSLA. We request that EPA require OCS PSD permit applicants to submit the specific well blocks for which they will seek authorization to operate under OCSLA in their applications to EPA.

Complying with this limitation in the Clean Air Act is essential in light of the regulation of CO₂, new NO₂ NAAQS, and new PM_{2.5} increments that are discussed above. Emissions of all of these pollutants are about to be subject to very different controls *all during the course of Shell’s proposed operations this summer*. For example, if Shell’s OCS PSD permits are issued before the greenhouse gas emissions rule is finalized, Shell may escape carbon regulation indefinitely as it pursues its off-shore drilling plans in the Arctic under its current leases. In light of EPA’s recent endangerment finding and the acute effects of climate change in the Arctic, EPA should recognize that Shell is intending to conduct a multi-year exploration plan that will include operations well after EPA has promulgated greenhouse gas emissions limitations throughout the country. As a result, it is critical that EPA ensure that any future operations in which Shell wishes to engage will be subject to current Clean Air Act requirements instead of those in place for this permit.

V. BACT Must Be Applied To All The Vessels And Emission Units That Shell Intends To Use In Order To Ensure Compliance With The Clean Air Act.

The Clean Air Act requires Best Available Control Technology (BACT) for both the Discoverer, an OCS source, and its support vessels. Thus, before issuing a Prevention of Significant Deterioration (PSD) permit to a major new stationary source (source), the EPA must conduct a BACT analysis for each pollutant that the source has the potential to emit in significant quantities.⁶⁷

In the draft PSD permit for Shell’s Beaufort operations, BACT has been applied to select emission units on-board the Discoverer and to the support vessel only while it is attached to the Discoverer. BACT has not been required for the Discoverer’s propulsion engine or the other numerous vessels that are associated with Shell’s proposed operations (hereafter

⁶⁵ MMS, EA Camden Bay at 1.

⁶⁶ MMS, EA Chukchi at 5. Specifically, these Prospects are defined as “Posey Blocks 6713, 6714, 6763, 6764, and 6912, Karo Blocks 6864 and 7007, Burger, Crackerjack, and SW Shoebill Prospects, OCS Lease Sale 193, Chukchi Sea, Alaska.” *Id.*

⁶⁷ 42 U.S.C. § 7475(a)(4).

ancillary fleet or ancillary vessels). These vessels include two icebreakers, a resupply ship, and an oil response fleet (composed of one offshore management ship and three 34-foot work boats) as well as all the vessels Shell has represented will remain more than 25 miles away from the Discoverer. This is significant because the ancillary vessels account for at least 95 percent of Shell's overall emissions for five of the criteria air pollutants and the emissions from Discoverer's propulsion engine have not been fully calculated.⁶⁸

The ancillary vessels and Discoverer's propulsion engine must be regulated as part of the emissions from the "OCS source." Issuing a permit that fails to require BACT for these vessels and engines would result in violations of section 328 of the CAA, contravene Congress's clear intent to regulate the emissions from vessels associated with drill ship exploration, would be counter to the goals of the PSD program which include protecting public health and welfare, and areas of "regional natural" value,⁶⁹ and a misapplication of 40 C.F.R. § 55.2.

A. The Clean Air Act's OCS Definition Encompasses Many of Shell's Activities that Are Not Being Regulated in the Draft Permit.

In section 328 of the Clean Air Act, Congress directed EPA to promulgate regulations to control air pollution over the Outer Continental Shelf (OCS) and provided a broad definition of OCS source:

The terms "Outer Continental Shelf source" and "OCS source" include 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 (43 U.S.C.A. § 1331 et seq.), 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 drill ship 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 en route to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.

⁶⁸ See, Appendix A, EPA Beaufort Statement of Basis at A-1: Summary of Annual Emissions for the Discoverer and the Associated Fleets. (*i.e.*, the Discoverer is projected to emit 51.23 tons/year of NO_x while the associated fleet is projected to emit 1,320.25 tons/year of NO_x. Overall, Shell's operations will emit 1,371.48 tons/year of NO_x, of which the associated fleet is responsible for 96.3%)

⁶⁹ 42 U.S.C. § 7470.

The Conference Report accompanying this provision explains:

Marine vessels emissions, including those from crew and supply boats, construction barges, tugboats, and tankers, which are associated with an OCS activity, will be included as part of the OCS facility emissions *for the purposes of regulation*. Air emissions associated with stationary and in-transit activities of the vessels will be included as part of the facility's emissions for vessel activities within a radius of 25 miles of the exploration, construction, development or production location. This *will ensure that the cruising emissions from marine vessels are controlled and offset as if they were part of the OCS facility's emissions.*⁷⁰

The Conference Report demonstrates Congress' intent to count marine vessel emissions as direct emissions from an OCS source not solely for the purposes of a potential to emit calculation, but also for the "purposes of regulation." The Senate Report confirms Congress's intent to regulate emissions from vessels:

[A]ll emissions from marine vessels (including engine emissions) which service or are associated with an OCS source, are subject to the same permitting, enforcement, monitoring, reporting, and offset requirements which would apply if these vessels were located in the corresponding onshore (State waters) area. This is intended to include emissions generated while vessels are traveling within the same air basin. These requirements should apply to vessel emissions occurring while at the OCS source, or when en route to or from the OCS source and to or from the corresponding onshore area.⁷¹

Shell's activities include a fleet of vessels with the potential to emit air pollutants that are regulated under OCSLA pursuant to an Exploration Plan that was approved by MMS, and that are located in the waters above the OCS. In addition to the drill ship the Discoverer, Shell's activities require a whole host of vessels that are servicing and otherwise associated with the drill ship and necessary for the exploration of hydrocarbons. These vessels provide fuel, personnel, supplies, and keep ice away from the drill ship and if need be clean-up oil – all of which are necessary for Shell's operations. Shell's drill ship and ancillary fleet of vessels therefore readily meet the statutory definition of OCS source.

The problem here appears to be the very narrow regulatory definition of OCS source, which only includes vessels when they are:

⁷⁰ 136 Cong. Rec. S16895-01 (Oct. 27, 1990) (emphasis added).

⁷¹ S. Rep. 101-228, 1990 U.S.C.C.A.N. 3385 (Dec. 20, 1989).

- (1) Permanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom, within the meaning of section 4(a)(1) of OCSLA (43 U.S.C. § 1331 et seq.); or
- (2) Physically attached to an OCS facility, in which case only the stationary source aspects of the vessels will be regulated.⁷²

This regulatory definition is in error. This is evidenced by the preamble to the regulations where EPA explains why it chose to require that vessels be attached to the seabed:

Section 328(a)(4)(C)(ii) defines an OCS source as a source that is, among other things, regulated or authorized under the OCSLA. The OCSLA in turn provides that the Department of the Interior ("DOI") may regulate "all installations and other devices permanently or temporarily attached to the seabed, which may be erected thereon for the purpose of exploring, developing, or producing resources therefrom, or any such installation or other device (other than a ship or vessel) for the purpose of transporting such resources." 43 U.S.C. § 1333(a)(1). Vessels therefore will be included in the definition of "OCS source" when they are "permanently or temporarily attached to the seabed" and are being used "for the purpose of exploring, developing or producing resources therefrom."⁷³

The preamble highlights that EPA developed the requirement that vessels be attached to the seabed because of its (mistaken belief) that DOI only has the authority to *regulate* attached vessels under the OCSLA. OCSLA negates this.

Vessels authorized under OCSLA include not only those attached to the seabed but also those involved with exploration, development, and production.⁷⁴ Those activities, as defined under OCSLA, require a number of vessels that are *never* attached to the seabed. For example, "exploration" includes seismic testing with ships,⁷⁵ "development" includes "geophysical activity,"⁷⁶ and "production" includes "transfer of minerals to shore."⁷⁷

We also point out that the regulatory definition of OCS source is completely inconsistent with the language in EPA's general PSD regulations. There EPA defined a "stationary source" – *i.e.*, one that is subject to regulation under the program – as "any building, structure, facility, or installation," which in turn is defined as "all of the pollutant-

⁷² 40 C.F.R. § 52.2.

⁷³ 57 Fed. Reg. 40792, 40793 (Sept. 4, 1992).

⁷⁴ 42 U.S.C. § 7627(a)(4)(C).

⁷⁵ 43 U.S.C. § 1331(k).

⁷⁶ 43 U.S.C. § 1331(l).

⁷⁷ 43 U.S.C. § 1331(m).

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)."⁷⁸

This is an incredibly broad interpretation of the activities that are covered under the PSD program. Indeed, the EPA has determined that facilities a mile or more apart are the same source for purposes of the PSD program.⁷⁹ Therefore, it is arbitrary for EPA on the one hand to implement the PSD program broadly on-shore, while narrowing the same program significantly when the activities are occurring offshore. This interpretation is also contrary to Congressional intent that OCS sources comply with the same requirements as non-OCS sources.⁸⁰

This definition of OCS source has caused great confusion with Shell's OCS PSD permit applications and we recommend that EPA return to the language in the statute in deciding which vessel and engines are subject to BACT.

B. We Present Option 3 And Encourage EPA to Adopt it as the Proper Interpretation of When the Discoverer Becomes an OCS Source.

In the proposed OCS PSD permit for Shell's Beaufort Sea exploratory drilling program, EPA has specifically requested comment on when the Discoverer is considered to be an OCS source and has proposed Options 1 and 2.⁸¹ We appreciate the agency's consideration of alternative interpretations of when the Discoverer becomes an OCS source. We encourage EPA to adopt Option 3.

Under Option 3, the Discoverer becomes an OCS source once it enters the 25 mile radius of the drill site and all other ancillary vessels that enter this radius that provide services for the drill rig or otherwise involved in servicing it, are also considered to be part of the OCS source.

We developed Option 3 as an alternative interpretation of when the Discoverer becomes an OCS source to ensure compliance with the plain language of the Clean Air Act in the statutory definition of OCS source.⁸² Our review of the options set forth by EPA

⁷⁸ 40 C.F.R. § 52.21.

⁷⁹ See EPA, Memorandum from Douglas E. Hardesty to Robert R. Robichaud, Re: Forest Oil Kustatan Facility and Osprey Platform Construction Permitting Applicability Determination (Aug. 21, 2001) (Appendix II) (2.8 miles); EPA, Memorandum from Director to Clyde B. Eller, Re: Shell Oil Company Wilmington Complex Specification of "Source" (May 16, 1980) (Appendix II).

⁸⁰ See Senate Report 101-228, 1990 U.S.C.A.N. 3385, 3463 (December 20, 1989) (explaining that "[t]his section of the bill is intended to ensure that air pollution from OCS activities does not degrade the air quality in coastal regions of the United States. This is to be achieved by applying the same air quality protection requirements as would apply if the OCS sources were located within the corresponding onshore area.")

⁸¹ EPA Stmt of Basis at 22-24.

⁸² 42 U.S.C. § 7627(a)(4)(C).

revealed that Option 1 reflects the same definition of OCS source that EPA proposed in the August 2009 Chukchi draft permit and Option 2 reflects the interpretation Shell has advocated for in its comments on its draft Chukchi permit.⁸³ Since neither of these options complies with the statutory definition of OCS source, we encourage EPA to adopt Option 3.

Under Option 3 the Discoverer becomes an OCS source when it enters the 25-mile radius of the drill site. Congress intended to regulate drill ship exploration that has the potential to emit air pollutants, is authorized by OCSLA, and is "in or on waters above the Outer Continental Shelf."⁸⁴ The propulsion engine on the Discoverer is intrinsic to its operations, and will transport the ship within the 25-mile radius surrounding the drill site, when Shell is moving on to and off the site, and when Shell is moving between lease blocks.⁸⁵ Shell's application also states that the rig may need to leave the drill-site and return due to adverse ice conditions or other factors.⁸⁶ Thus, the statutory definition of OCS source includes the Discoverer's propulsion engine as the ship moves within the 25-mile radius of the drill site. These movements of the Discoverer are akin to the type of pre-construction activities that are routinely regulated by EPA under the PSD program.

Inasmuch as these vessels will or may operate within the 25-mile radius of the drill site, they must be regulated as part of the OCS source.

Application of BACT and corresponding onshore area regulations to all the ancillary vessel and propulsion engine emissions is necessary because they are "emissions from [] vessel[s] servicing or associated with an OCS source,"⁸⁷ here the Discoverer, "including emissions while at the OCS source"⁸⁸ and such emissions "shall be considered direct emissions from the OCS source."⁸⁹ The ancillary fleet of vessels provide fuel, supplies, and personnel to the Discoverer and keep ice and oil at bay all of which are "servicing or associated with an OCS source."⁹⁰ These emissions therefore, "will be included as part of the OCS facility emissions *for the purposes of regulation*."⁹¹ Since the ancillary

⁸³ Shell's comments on the original draft permit for the Chukchi operations included a suggestion that the Discoverer does not become an OCS source until the anchoring process is complete. See EPA Revised Stmt of Basis for draft Chukchi Permit at 20.

⁸⁴ 42 U.S.C. § 7627(a)(4)(C).

⁸⁵ See Air Sciences, Outer Continental Shelf Pre-Construction Air Permit Application Revised Frontier Discoverer Chukchi Sea Exploration Drilling Program Prepared for Shell Offshore Inc. at 25 (Feb. 2009) (hereafter "Shell Revised OCS Chukchi App.") (The potential to emit does not include "the Discoverer propulsion emissions for the approximate four hours of time to bring the Discoverer the final 25 miles to the drill site and move it away").

⁸⁶ Shell Revised Chukchi OCS App. at 9.

⁸⁷ 42 U.S.C. § 7627(a)(4)(C).

⁸⁸ 42 U.S.C. § 7627(a)(4)(C).

⁸⁹ 42 U.S.C. § 7627(a)(4)(C).

⁹⁰ 42 U.S.C. § 7627(a)(4)(C).

vessels are associated with the Discoverer (irrespective of whether they are OCS sources in and of themselves), they are to be considered for regulatory purposes as direct emissions from the source.⁹² The statutory definition of "OCS source" does not exempt any activities or parts of an OCS source from the control technologies requirements.⁹³

Option 3 addresses several of our concerns with the previous interpretation of when the Discoverer becomes an OCS source as put forth by EPA last August. Including the fact that an entire category of unattached vessels that are authorized under OCSLA – *i.e.*, all the equipment and activities that are authorized under the OCSLA but are not attached to the seabed – were impermissibly not counted as part of the OCS source. Option 3 also addresses the concerns raised below with the two options currently provided for consideration.

More importantly, it is critical that emissions that can be regulated under the Act are subject to regulation now, because this permit will set the bar for the myriad of other offshore oil and gas exploration activities that we see coming down the pike.⁹⁴ Shell's permit demonstrates the incredibly significant impact just one operator can have on air quality in the Arctic and why it is essential that as many of the emissions from these operations are regulated under the Clean Air Act as possible. It is for this reason that we have been encouraging the EPA to ensure that the emissions from the Discoverer's propulsion engine as well as the emissions from all vessels that are a part of Shell's operations be subject to BACT.

C. Options 1 And 2 Fail to Comply with the Plain Language of the Clean Air Act and do Not Ensure That All of Shell's Emissions are Regulated Once the Discoverer is an OCS Source.

We encourage EPA to adopt Option 3 for regulating the Discoverer as an OCS source because, as discussed below, neither Option 1 nor Option 2 comport with the statutory definition of OCS source or would be protective enough of the air quality in the Arctic.

Under Option 1, the Discoverer becomes an OCS source at the point in time when a single anchor is placed at the drill site and ceases to be an OCS source at the time when the last anchor is removed.⁹⁵ Option 1 fails to regulate the emissions from the Discoverer when it engages in pre-construction activities – *i.e.*, movement of the drill rig onto the drill site and construction of the mudline cellar.

⁹¹ 136 Cong. Rec. S16895-01 (Oct. 27, 1990) (emphasis added).

⁹² We also point out that the ancillary vessels are authorized under the Outer Continental Shelf Lands Act (OCSLA) because Minerals Management Service (MMS) must approve Shell's exploration plan and issue a permit to commence exploration before Shell's operations – which the supporting vessels are an essential part of – can commence. See 43 U.S.C. § 1340(b).

⁹³ 42 U.S.C. § 7627(a)(4)(C).

⁹⁴ For example, BP is proposing work on the Liberty prospect, and both ConocoPhillips and Statoil are anticipating submitting exploration plans in the near future.

⁹⁵ *Id.*

Option 2 provides that the Discoverer becomes an OCS source when an on-site company representative declares that the Discoverer is "secure and stable in a position to commence exploratory activity at the drill site."⁹⁶ EPA developed Option 2 in response to Shell's suggestion that until the anchoring process is complete, the Discoverer is not "erected" for the purposes of exploring for resources within the regulatory definition of OCS source.⁹⁷

Presumably, both Options 1 and 2 are based on the narrow regulatory definition of OCS source. Options 1 and 2's basis in the overly narrow regulatory definition instead of the more inclusive statutory definition is unlawful.

As we previously explained, Congress's broad definition of "OCS source" is unambiguous and left EPA with no authority to restrict the definition of "OCS source" to only those vessels that are attached to the seabed floor. This is unlawful for the reasons described by the Supreme Court in *Massachusetts v. EPA*. There, the Court rejected EPA's interpretation that excluded carbon dioxide from the Clean Air Act's broad definition of "air pollutant."⁹⁸ The Court found that the inclusive and "sweeping" language in the statutory definition of "air pollutant," specifically "includes any," was unambiguous and precluded EPA's restriction of the definition that excluded "carbon dioxide."

Just as the EPA had in *Massachusetts*, the agency has attempted to interpret and restrict a statutory definition that is unambiguous. The statutory definition of OCS source is an inclusive definition because Congress chose broad language, specifically, "The term[] . . . OCS source' *include[s] any* equipment, activity."⁹⁹ EPA has impermissibly restricted the statutory definition of "OCS source" to vessels that are "permanently or temporarily attached to the seabed," in both the regulatory definition of OCS source and its application of the regulatory definition to the Discoverer.¹⁰⁰

Congress emphasized that the definition is inclusive, not exclusive, when it suggested some of the activities that would fall within the definition: "[s]uch activities include, *but are not limited to*."¹⁰¹ Because Congress only required that an OCS source meet the three elements listed in (i) - (iii),¹⁰² EPA did not have the authority to limit the definition to those vessels that are attached to the seabed. Nothing in the statutory definition of OCS

⁹⁶ *Id.*

⁹⁷ *Id.* at 20.

⁹⁸ See *Massachusetts v. EPA*, 549 U.S. at 528-529 (stating that the CAA definition of "air pollutant" is unambiguous because Congress used inclusive language).

⁹⁹ 42 U.S.C. § 7627(a)(4)(C) [emphasis added].

¹⁰⁰ 40 C.F.R. § 55.2.

¹⁰¹ 42 U.S.C. § 7627(a)(4)(C) [emphasis added].

¹⁰² 42 U.S.C. § 7627(a)(4)(C).

source suggests that the time at which a drill-ship becomes an OCS source hinges upon whether the vessel is attached to the seabed. In fact, the Discoverer meets the three statutory elements days before the anchoring process even begins, triggering the statute's jurisdiction.

The Discoverer clearly meets the definition of an "OCS source" under section 328 of the Act. In order to be subject to the PSD program, the emissions from the Discoverer's engines (minus the propulsion engine) *and* the ancillary vessels were added together and Shell's operations were determined to be a "major source" and thus, subject to regulation under the PSD program.¹⁰³ But when it came time to apply control technologies to Shell's operations, the ancillary vessels (aside from the supply vessel when it is attached to Discoverer) were excluded.

With respect to Option 1, there is an internal inconsistency with this option. While the Discoverer is considered to be an OCS source once the first anchor is placed, this Option fails to then require treatment of the "anchor handler" – the icebreaker – as part of the OCS source since it is connected to the Discoverer for the purpose of helping to place the anchors. At the very least, under Option 1 BACT would need to be applied to the Discoverer's propulsion engine (which may be used during anchoring), as well as the "anchor handler," the supply vessel, and all the other engines on the Discoverer for which a BACT analysis was already performed.

With respect to Option 2, it is clear that Shell suggested Option 2 as a way for it to *avoid* having to control the emissions from the Discoverer's propulsion engine. Shell's application for the August 2009 proposed permit stated that the propulsion engine will be shut down before the first anchor is dropped.¹⁰⁴ However, in comments on the August 2009 proposed permit for the Chukchi operations, Shell, MMS, and AEWC highlighted a major problem with this proposal: it prohibited Shell from using the propulsion engines during the anchoring and tensioning process and throughout the exploratory drilling operations:

- MMS "expressed concern" that the permit prohibited the Discoverer from using the propulsion engines after the anchoring process was complete.¹⁰⁵
- AEWC stated that EPA should consult with the coast guard to determine if it is safe for Shell to discontinue the propulsion engine while setting anchors, especially in rough sea conditions.¹⁰⁶

¹⁰³ See Appendix A, EPA Stmt of Basis at A-1. The supporting vessels will emit the following percentages of the total projected project emissions for each criteria pollutant: 98% of CO, 96% of NO_x, 93% of PM_{2.5}, 94% of PM₁₀, 90% of VOC, and 91% of lead. Shell estimated that the ancillary vessels have the potential to emit significant amounts of criteria pollutants in an overwhelmingly greater amount than the Discoverer.

¹⁰⁴ Shell Revised OCS App. at 6.

¹⁰⁵ Letter from John Groll, MMS to EPA at 2 (Oct. 2, 2009) (Attachment 9).

¹⁰⁶ See AEWC comments at 14 (Attachment 10) (available at: http://www.epa.gov/region10/pdf/permits/shell/chukchi_aewc_icas_nsb_combined_102009.pdf)

- Shell also stated that it would try to comply with the permit requirement not to use the propulsion engines during the anchoring process but if that proved to be dangerous, Shell would request a permit modification.¹⁰⁷

Based upon these concerns, it is likely that at some point, EPA will have to allow Shell to use the propulsion engine during the anchoring and tensioning process. If this is true, then its emissions must be regulated under the Clean Air Act.

Furthermore, EPA itself has noted that the Discoverer can safely drill before all eight anchors are placed.¹⁰⁸ Thus, Option 2 presents a scenario for regulation that is even more restrictive than that provided in the regulatory definition of OCS source since it requires both attachment to the seabed floor and a declaration of position. Basing the regulation of the Discoverer on this Option would readily be found to violate not only the plain language of the statute but also EPA's regulation.

Presumably BACT and corresponding onshore area regulations were not applied to the ancillary vessels based on EPA's application of its regulatory definition of "OCS source,"¹⁰⁹ to Shell's proposed operations. The regulatory definition as applied here violates the plain language of the statute.¹¹⁰

2. EPA Failed to Consistently Apply the COA Regulations to Shell's Ancillary Vessels

EPA promulgated 40 CFR Part 55 to establish requirements to control air pollution from OCS sources in order to ensure attainment and maintenance of Federal and State ambient air quality standards and to comply with the provisions of Part C of Title I of the Clean Air Act. EPA recently finalized an update to these regulations in response to a Notice of Intent filed by Shell Offshore, Inc. on January 9, 2009.¹¹¹ EPA applied the requirements in 40 CFR 55 to the sources on the Discoverer but failed to apply all applicable COA regulations to the ancillary vessels supporting the OCS source, as intended by Section 328 of the CAA.

("Typically large vessel propulsion engines continue to operate while anchors are set and are started prior to releasing anchors, this way the captain has full control of the vessel while anchors are set and released. Setting a large drillship adrift in heavy ice conditions without an operational propulsion systems does not appear to be a safe plan.")

¹⁰⁷ EPA Chukchi Revised Stmt of Basis at 20.

¹⁰⁸ EPA Stmt of Basis at 23 (citing United States Patent No. 4,509,448).

¹⁰⁹ See 40 C.F.R. § 55.2.

¹¹⁰ See 42 U.S.C. § 7627(a)(4)(C).

¹¹¹ 75 Fed. Reg. 3387(Jan. 21, 2010), effective February 22, 2010.

EPA must apply the applicable legal requirements of the State of Alaska that were Incorporated by Reference into 40 CFR 55, effective February 22, 2010, to *all* of the ancillary vessels in Shell’s exploratory drilling program. This would include, for example, applying the COA incinerator visible emissions regulations (18 AAC 50.050) found in Condition K.11 of the proposed permit to the incinerators found on the two icebreakers (e.g., TV-8 of the Tor Viking) and the oil response vessel (N-6). It would also include the addition of all fuel-burning emission sources from the supply ship (e.g., FD-31), the two icebreakers (e.g., units TV 1-7 of the Tor Viking) and the OSR fleet (e.g., units PBT 1-4, units AEB 1-4, units N 1-5, units K 1-6 and units R 1-3) to the list of sources subject to the PM, SO₂ and visible emissions standards, monitoring, recordkeeping and reporting requirements in proposed Permit Conditions B.8, B.9, B.12, B.13, B.14, B.15, B.16 and B.17.

V. The Potential To Emit Calculations Fail To Account for All of Shell’s Proposed Operations.

As an initial matter, we commend EPA for its clarification of how and why nonroad engines are a part of the Potential to Emit calculations for OCS activities.¹¹² We agree that “the exclusion of nonroad engines from the general definition of ‘stationary source’ in Section 302(z) of the CAA is overridden by the more specific provisions in Section 328 of the CAA and 40 C.F.R. § 55.2.”¹¹³

Our concerns with the existing PTE calculations are with the exclusion of the Discoverer’s propulsion engine and other vessels and contingencies from Shell’s overall potential to emit calculations. With respect to the Discoverer’s propulsion engine, as discussed previously, because this engine is part of the drill rig and used in the “construction” and “transportation” of the drill rig, its potential to emit needed to be calculated so BACT could be applied to its emissions.¹¹⁴ Similarly, a Marine Mammal Observer vessel is listed as part of Shell’s proposed operations.¹¹⁵ It does not appear that the emissions from this vessel were included in the PTE.

Emissions associated with emergency situations, namely oil spills, were not included in the PTE. An oil spill or some other similar emergency situation would result not only in additional, unaccounted for vessel emissions but also emissions from, for example, in situ burning of spilled materials. Major sources of air pollution cannot automatically escape regulation or liability for excess emissions resulting from foreseeable or unforeseeable circumstances.

Under the PSD program, EPA has maintained a longstanding policy that the Clean Air Act does not allow automatic exemptions for excess emissions during startup, shutdown,

¹¹² EPA Stmt of Basis at 25-26.

¹¹³ *Id.* at 23.

¹¹⁴ 42 U.S.C. § 7627(a)(4)(C).

¹¹⁵ Shell Camden Bay EIA at 22.

and malfunction (SSM) events.¹¹⁶ Recently, the Tenth Circuit in *Arizona Public Service Co. v. U.S.* highlighted that the agency's "longstanding policy makes clear that excess emissions resulting from malfunctions are violations of the Clean Air Act, for such emissions can interfere with attainment of the national air standards."¹¹⁷ The EAB relied upon this policy to remand a PSD permit that included a provision exempting a coal-fired steam electric generating station from otherwise applicable emissions limits during SSM events.¹¹⁸

Just as startup, shutdown, and malfunction events can be foreseen and planned for at a coal-fired power plant, they can be foreseen and planned for as part of an oil spill response event at an off-shore drilling site. Indeed, several legal requirements mandate that Shell meticulously plan for a response to an oil spill.¹¹⁹ Because an oil spill is such a likely, and not merely an unforeseeable event, Shell is employing an entire "oil spill response" (OSR) fleet as part of its proposed operations. One of the OSR vessels, the *Nanuq*, will be positioned about 5,000 meters away from the *Discoverer* and will be used to conduct "on-water drills" for training, approximately 8-hours at a time, no more than once per day.¹²⁰

Shell's response to an oil spill would release a large quantity of emissions that are unaccounted for in the draft Permit. By moving the entire OSR fleet to the drill site, cleaning up oil, and conducting other response activities, the OSR fleet will release air emissions by using the propulsion engines, generators, and other equipment. Moreover, Shell has suggested that it will burn spilt materials (*i.e.*, oil and/or gas) as a method to clean up a spill, certainly resulting in even more significant air emissions.¹²¹ To provide Shell with an automatic exemption for these excess emissions would be contrary to EPA's

¹¹⁶ See, *i.e.*, *Indeck-Elwood, LLC*, PSD Appeal No. 03-04, Slip Op. at 66 (Sept. 27, 2006) ("Indeed, EPA has, since 1977, disallowed automatic or blanket exemptions for excess emissions during startup, shutdown, maintenance, and malfunctions by defining most periods of excess emissions as "violations" of the applicable emission limitations."), citing *In re Tallmadge Generating Station*, PSD Appeal No. 02-12, at 24 (EAB, May 21, 2003) (stating that EPA has issued several guidance documents over the years "clearly expressing the Agency's long-standing position that automatic exemptions for excess emissions during startup and shutdown periods cannot be reconciled with the directives of the CAA.").

¹¹⁷ 562 F.3d 1116 (10th Cir. 2009); See also 72 Fed. Reg. at 25,702, 25,705; State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999) (hereinafter Herman Memorandum); Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions (Feb. 15, 1983) (hereinafter Bennett Memorandum).

¹¹⁸ *Indeck-Elwood, LLC*, PSD Appeal No. 03-04, Slip Op. at 71, 76 (Sept. 27, 2006).

¹¹⁹ See *e.g.*, Shell Beaufort Sea Regional Oil Discharge Prevention and Contingency Plan (ODPCP) (April 2007) (available at:

http://www.mms.gov/alaska/ref/ProjectHistory/Shell_BF/2007_cplan.pdf) (Attachment 13).

¹²⁰ EPA Stmt of Basis at 59.

¹²¹ Shell, Beaufort ODPCP at 1-27, 1-29, 1-51, 1-53, 1-86; § 1.7 at 1-95 to 1-96, 3-16, 3-20 to 3-36 (available at:

http://www.mms.gov/alaska/ref/ProjectHistory/2009_Chukchi_Shell/2009_0623_Shell_cplan.pdf).

longstanding policy under the PSD program and would violate the Clean Air Act. Excess emissions resulting from an oil spill response could have the potential to violate the national ambient air quality standards and other Clean Air Act requirements, thus Shell's permit must account for these emissions.

Specifically, the OSR fleet's activities and the impacts of burning spilt materials resulting from an oil spill response must be included in the potential to emit analysis. "Potential to emit" means "the maximum capacity of a source to emit a pollutant under its physical and operational design."¹²² By employing and training the OSR fleet, Shell has included an oil spill response within the operational design of the OSR fleet. Because these activities fall within the operational design, they increase the maximum capacity of Shell's operations and must be accounted for in the PTE.

The EPA concludes that

There are other vessels that will be associated with Shell's exploratory drilling program, such as an oil tanker, a barge, and shallow water landing craft. Based on Shell's application submittals, none of these vessels will be operating within 25 miles of the Discoverer while the Discoverer is an OCS source. Emissions from these other vessels are therefore not included in determining the potential to emit of Shell's exploration drilling program in conjunction with applying the requirements of the OCS or PSD program.¹²³

Shell needs to explain whether these vessels will be used within 25 miles of the Discoverer in the event of an oil spill or other emergency situation. If so, the emissions from these vessels must be included in Shell's PTE.

As EPA explained, "determining a project's PTE is essential for determining . . . the scope of PSD review, in particular, the pollutants that are subject to application of BACT, analysis of ambient air quality impacts from the project, . . . and analysis of impacts on soils and vegetation."¹²⁴ Due to the importance of the PTE calculations, it is imperative that these issues are addressed with Shell and a permit is proposed for public input that takes *all* of Shell's proposed emissions into account as required by the Clean Air Act.

1. A Calculation of Shut Downs and Start Ups in Light of Mitigation Measures that Will be Necessary to Protect Marine Mammals is also Necessary.

Shell states in its permit application that while "[s]ounds from the *Discoverer* have not previously been measured in the Arctic or elsewhere," "mitigation as described for

¹²² 40 C.F.R. § 52.21(b)(4).

¹²³ EPA Stmt of Basis at 26.

¹²⁴ EPA Stmt of Basis at 32.

seismic activities including ramp ups, power downs, and shut downs should not be necessary for drilling activities”.¹²⁵ We disagree that the now typical mitigation measures for activities in the Arctic – *i.e.*, of powering or shutting down when marine mammals are sited and powering up when the marine life has moved on – will not be required of Shell for its drilling operations. We ask that EPA ensure that ramp downs and ramp ups, and shut downs and start ups be taken into account in determining the emissions from Shell’s operations, as well as the necessary best available control technologies.

VI. In Several Instances A BACT Analysis Was Not Performed For Emissions Units And In Other Instances Improvements Are Required For The Analysis That Was Performed.

For all sources subject to BACT, EPA must establish an “emission limitation based on the maximum degree of reduction” for each pollutant that the source will emit in significant quantities.¹²⁶ To determine the appropriate emission limitation, the EPA may take into account, “energy, environmental, and economic impacts and other costs.”¹²⁷ In doing so, the EPA must adequately justify and explain its decision to eliminate control technologies due to technical infeasibility or collateral impacts.¹²⁸

In applying BACT here, EPA utilized the top-down approach.¹²⁹ As EPA explained in its New Source Review Workshop Manual:

the top-down process provides that all available control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent--or “top”--alternative. That alternative is established as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not "achievable" in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on.¹³⁰

¹²⁵ Shell Beaufort Sea Marine Mammal Monitoring and Mitigation Plan at 13. We also point out that Shell has previously noted that “[t]he presence of MMOs onboard drilling and support vessels will be a core component of compliance with the 4MP. The MMOs will be responsible for collecting basic data on observations of marine mammals and for implementing mitigation measures including vessel avoidance measures and factored into *decisions concerning operational shutdown*.” Shell Revised Chukchi OCS App. at 145 (emphasis added).

¹²⁶ 42 U.S.C. § 7479(3).

¹²⁷ *Id.*

¹²⁸ *In re: Knauf Fiber Glass, GMBH*, 8 E.A.D. 121, 131 (Feb. 4, 1999) (remanding a PSD permit to the permitting agency).

¹²⁹ See EPA, New Source Review Workshop Manual (1990) (available at: <http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf>).

¹³⁰ *Id.* at B.2.

Thus, BACT requires that EPA do more than summarily dismiss technologies and instead provide "a clearly ascertainable basis for a conclusion."¹³¹ In *Knauf Fiber Glass*, the Environmental Appeals Board was unable to ascertain whether a PSD permit included the best available control technology for the source because the permitting authority did not provide proper documentation of the potential control technologies and a technical feasibility analysis. The EAB required the permitting authority to conduct a supplemental BACT analysis that included a list of control options, an explanation of the technical feasibility analysis, and justifications for eliminating control options.¹³²

In Shell's draft permit, EPA purports to have set BACT for all required sources. A rigorous analysis must be undertaken to arrive at BACT for *all* required sources. In situations like this, the EAB has emphasized that an agency's less than rigorous analysis is not BACT:

If reviewing authorities let slip their rigorous look at 'all' appropriate technologies, if the target ever eases from the 'maximum degree of reduction' available to something less or more convenient, the result may be somewhat protective, may be superior to some pollution control elsewhere, but it will not be BACT.¹³³

In Shell's draft permit, EPA has not yet met the rigorous BACT demands because the agency still has not: (1) adequately supported its decision to eliminate the best available control technology for several engines and pollutants; and (2) conducted BACT for the propulsion engines and ancillary vessels.

A. The Proposed Best Available Control Technology (BACT) Emission Limits Do Not Necessarily Reflect the Maximum Level of Control that Can be Achieved.

1. NO_x BACT analysis for the six generator engines

We support EPA's determination of BACT as the use of selective catalytic reduction (SCR) to reduce NO_x emissions from the six generator engines on board the Discoverer. We question, however, if the associated permitted emission rate of 0.5 g/kW-hr (Permit Condition C.3.1) is the appropriate corresponding emission limit for the proposed system. Statements from the vendor, D.E.C. Marine, indicate that the SCR system can achieve an emission rate as low as 0.1 g/kW-hr under ideal steady state conditions.¹³⁴ This represents a limit that is 80% lower than what is proposed as the permit limit for these units. It is quite possible that the units will, in reality, operate at a level lower than the

¹³¹ *In re: Knauf Fiber Glass*, 8 E.A.D. at 134.

¹³² *Id.*

¹³³ *In re: Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, Slip Op. at 16, 14 E.A.D. --- (EAB Feb. 18, 2009).

¹³⁴ EPA Stmt of Basis at 68.

guaranteed 0.5 g/kW-hr emission rate. We support EPA's requirement to test these engines (Condition C.6) to verify emission limits can be achieved; however, these data are needed *prior* to issuing a permit in order to set an appropriate BACT limit. In the event that the test data for these units demonstrate the ability to meet a lower NO_x limit than the proposed 0.5 g/kW-hr, EPA must revise the BACT limit accordingly.

Additionally, it seems possible that exhaust gases from other emission units could be routed to and treated by the SCR systems for the generator engines. Since it was deemed infeasible to install SCR for the smaller compression ignition internal combustion engines on board the Discoverer primarily due to space considerations, please provide justification for why these engines can't use the same SCR system employed for the generator engines.

2. NO_x BACT analysis for smaller compression ignition internal combustion engines.

EPA's proposed BACT for the smaller compression ignition engines on the Discoverer is "good combustion practices."¹³⁵ This BACT determination applies to the hydraulic power unit (HPU) engines, cranes, cementing units and logging winches, which collectively represent over 80 percent of the impact to maximum annual NO_x concentrations from Shell's exploration activities.¹³⁶ According to Shell's application for the Beaufort Sea, "[m]aximum impacts for annual NO₂ are driven by poorer dispersing engines (HPU engines and cementing units) on the *Discoverer*".¹³⁷ We do not support EPA's conclusion that simply employing "good combustion practices" for all of these engines is the best available control technology.

In particular, we think EPA should reconsider the option for re-powering the two HPU units as BACT for these engines. The HPU's are prime candidates for re-powering to Tier 3 engines and, in fact, Shell indicates that the only technical consideration is the "additional effort [that] would be necessary to attach all the necessary hydraulic lines and other associated equipment."¹³⁸ The cost-effectiveness for these engines – at less than \$10,000 per ton of NO_x removed - is favorable, contrary to Shell's conclusions. Shell states, in its BACT report that:

In conclusion, none of the engine replacement options evaluated are less than \$10,000 per ton of NO_x removed. Given the very small quantity of

¹³⁵ See EPA Stmt of Basis at 73; EPA draft OCS PSD Proposed Permit for Shell Beaufort Sea Operations, at Conditions G.3, H.3 and I.3.

¹³⁶ Shell supplemental material from the Chukchi permit, September 17, 2009, Table 7-4: Discoverer Source Contributions at the Screening Maximum Impact Locations

¹³⁷ Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, ENVIRON Project No. 03-22090A, Revised January 2010, p. 168.

¹³⁸ ENVIRON report: Diesel Engine Best Available Control Technology Analysis, December 2009, Project No. 0322090A, p. 21.

NO_x that would be eliminated by these engine replacements, engine replacement is not cost effective and not BACT.¹³⁹

Re-powering the HPU units, in fact, does appear to be cost effective according to Shell's own evaluation. Shell's updated BACT analysis contained in the permit record estimates a cost for re-powering the HPU units at \$8,671 per ton of NO_x removed (clearly less than \$10,000 per ton).¹⁴⁰ If \$10,000 per ton is the threshold of consideration, as implied in Shell's assertion, then certainly this alternative must be more seriously considered. In fact, EPA did not even address this alternative in the statement of basis for the proposed permit. We disagree with Shell that the small quantity of NO_x emissions that would be removed justifies an argument for eliminating this alternative as BACT when, in fact, the HPU units contribute 30% of the maximum modeled NO_x concentrations from Shell's activities.¹⁴¹

If, however, EPA does not revise BACT for the HPUs to require re-powering of the engines to Tier 3 engines then it must at least consider re-tooling these and other engines as BACT instead of simply employing "good engineering practices." Specifically, the Cam Shaft Cylinder Reengineering (CCSC) kit suggested by us in our prior comments on the Chukchi Sea proposed permit appears to be a cost-effective BACT alternative for the HPU engines as well as the two larger cementing units. Even considering the slightly higher cost per ton of NO_x reduction than for re-powering the HPUs, which includes Shell's estimated [\$50,000] shipping costs for installing the re-tooling kits, we believe this is a viable option that could (and should) be considered as BACT for these units. The fact that this re-tooling option has had successful test results in Arctic conditions and there appear to be no issues with the use of ULSD further supports its use in Shell's specific application. EPA must identify the potential emission limits that would result from re-tooling these specific units. If EPA believes this alternative is not cost-effective then it must provide a more thorough justification for this position including specific examples of cases where these levels of cost (\$/ton of removal) were rejected as not cost-effective. Again, we do not agree with Shell's recommendation that these "small and infrequently used" engines do not warrant further consideration of BACT alternatives. The HPUs and cementing units make up 64% of the maximum-modeled NO_x concentrations from Shell's activities.¹⁴²

¹³⁹ There appear to be two versions of this report. The one included in the Chukchi Permit Administrative Record is titled the same but includes a threshold of \$10,000 per ton, as quoted here - ENVIRON report: Diesel Engine Best Available Control Technology Analysis, December 2009, Project No. 0322090A, p. 23.

¹⁴⁰ See Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, ENVIRON Project No. 03-22090A, Revised January 2010, p. 69 and ENVIRON report: Diesel Engine Best Available Control Technology Analysis, December 2009, Project No. 0322090A, see p. 15 Table 4-1.

¹⁴¹ Shell supplemental material for the Chukchi permit, September 17, 2009, Table 7-4: Discoverer Source Contributions at the Screening Maximum Impact Locations

¹⁴² *Id.*

The various engines covered by this general BACT determination continue to have permitted emission rates, which are defined as BACT limits, as follows:

Unit	NO _x BACT Limit in g/kWh	Permit Condition
HPU Engine FD-12	13.155	G.2.2.1
HPU Engine FD-13	13.155	G.2.2.1
Deck Crane FD-14	10.327	H.2.2.1
Deck Crane DF-15	10.327	H.2.2.1
Cementing Unit FD-16	13.155	I.2.2.1
Cementing Unit FD-17	13.155	I.2.2.1
Cementing Unit FD-18	15.717	I.2.2.1
Logging Winch FD-19	4.0	I.2.2.1
Logging Winch FD-20	7.5	I.2.2.1

According to EPA and Shell, the hydraulic power units (HPU) will be used “very similarly” to the MLC compressor engines.¹⁴³ The HPU engines are 250 hp Detroit Diesel 8V-71 engines and the BACT limit is based on engine dynamometer test data reported in EPA’s 2002 Diesel Health Assessment. The cementing unit engines (FD-16, FD-17, FD-18) and logging winch engine FD-19 are also Detroit Diesel 8V-71 engines (or from the same “family” of engines) with BACT limits also based on EPA’s 2002 Diesel Health Assessment data.

The BACT limits for the FD-20 logging winch and the two deck cranes are based on manufacturer emission data and likely represent good combustion practices. These BACT limits are lower than for the other engines. EPA’s proposed BACT limits for the Detroit Diesel 8V-71 engines may not reflect the “good combustion practices” that it determined were the best available controls. At a very minimum, EPA must quantify the reductions in NO_x emissions that can be expected from implementation of the good combustion practices defined as BACT instead of requiring the practices but enforcing an emission limit that is simply based on average engine operation for these 8V-71 engines. We support EPA’s requirement to test these engines (Conditions G.7, H.7 and I.7) to verify emission limits can be achieved; however, these data are needed prior to issuing a permit to set a BACT limit and determine BACT. In the event that the test data for these units demonstrate the ability to meet lower NO_x limits, EPA must revise the BACT limits accordingly.

Thus, for these reasons, EPA still has not adequately evaluated BACT for NO_x for the small compression ignition engines. We request that EPA re-consider its review of BACT for these engines, per 40 C.F.R. § 52.21(b)(12). EPA has failed to show that the proposed emission limits reflect the maximum degree of NO_x reduction that can be achieved from these engines (in fact, they appear to only reflect average operation of these engines) and has failed to consider all technically and economically feasible control options. We request that EPA determine the level of control that reflects the maximum

¹⁴³ See EPA Stmt of Basis at 47.

degree of NO_x reduction that can be achieved from these small engines and impose a NO_x emission limit that reflects that maximum degree of NO_x control.

3. PM BACT analysis for diesel generator engines.

EPA is proposing the use of oxidation catalysts (OxyCat) as BACT for the six generator diesel internal combustion engines.¹⁴⁴ EPA eliminated the use of catalytic diesel particulate filters (CDPF) as technically infeasible control options for these engines. EPA did not include any additional analysis of BACT alternatives for these engines in the proposed permit documents. We would like EPA to more thoroughly evaluate CDPF as BACT for these engines, particularly given that they contribute 30% of the maximum concentrations of PM from Shell's activities.¹⁴⁵ According to EPA, "[s]ince CDPF systems are not commercially available in combination with SCR systems for diesel engines such as the Discoverer's generator diesel IC engines, EPA believes CDPF systems are technically infeasible for this specific application."¹⁴⁶ Further, EPA assumes that even if CDPF technology were technically feasible, it would not be a cost-effective control option.¹⁴⁷

Regarding EPA's reference to cost-effectiveness for CDPF control for the six generator engines, EPA must provide a comparative assessment of the economic impacts of applying this technology in similar applications. Shell provided a cost estimate for the use of CDPF control for the six generator engines of roughly \$22,000 per year per ton of PM removed for all six engines.¹⁴⁸ In its application, Shell simply states "[t]his cost is considered too high to be required as BACT".¹⁴⁹ If EPA is going to eliminate the use of CDPF technology as an effective control option based on cost-effectiveness then it must present a detailed argument as to why \$22,000 per ton of PM removed per year is not considered cost effective for these units. This argument must include an analysis of employing these technologies for Shell's proposed operations in the Chukchi Sea as well. EPA must compare the associated per ton costs with similar applications of CDPF.

According to EPA guidance, the applicant must demonstrate that costs of pollutant removal are "disproportionately high when compared to the cost of control for that particular pollutant and source in recent BACT determinations."¹⁵⁰ EPA and Shell have provided no such comparison analysis to support its claim that \$22,000 is not cost effective. In fact, it does not appear that \$22,000 per ton of PM removal per year is

¹⁴⁴ See EPA Stmt of Basis at 79; EPA Draft Beaufort Permit at Condition C.2.

¹⁴⁵ Shell supplemental material for the Chukchi Sea permit, September 17, 2009, Table 7-4: Discoverer Source Contributions at the Screening Maximum Impact Locations.

¹⁴⁶ EPA Stmt of Basis at 79.

¹⁴⁷ See EPA Stmt of Basis at 79, fn15.

¹⁴⁸ See Shell Beaufort Air Permit at 58 and Appendix C.

¹⁴⁹ See Shell Revised Chukchi OCS App. at 47.

¹⁵⁰ Draft NSR Workshop Manual, at B.32 (October 1990).

necessarily cost prohibitive. EPA estimates that the cost of several diesel retrofit programs: (1) the Urban Bus Retrofit and Rebuild program (\$31,500/ton of PM reduced); (2) the 2007 Heavy-Duty diesel emission standards (\$14,200/ton); and (3) the Non-road Tier 4 emission standards (\$11,200/ton) indicate that “retrofits can be a cost effective way to reduce air pollution.”¹⁵¹

Regarding EPA’s determination that CDPF technology is technically infeasible, it is not sufficient to simply provide one manufacturer’s statement that it is unaware of CDPF applications for these engine types.¹⁵² In addition to comparing the proposed BACT determination to the BACT determinations of other permitted sources, the BACT analysis should also be based on a review of the maximum degree of emission reductions that can be achieved for the engines based on a rigorous investigation of all available control options. EPA and Shell must more thoroughly investigate the use of CDPF in application where Selective Catalytic Reduction (SCR) is also used to control NO_x in determining the BACT limits for these engines.

Several manufacturers have demonstrated commercial CDPF retrofit applications in conjunction with SCR to control NO_x emissions demonstrating that many of the technical considerations that Shell raises (e.g., backpressure on the engines, cross-sectional area for the catalyst matrix, filter element exchange frequency, etc.) can be overcome. These applications were for a wide range of engine sizes and a wide range of ages.¹⁵³ And there is recent research to support the effectiveness of integrated catalytic control systems for NO_x and PM reduction in both stationary and mobile applications for small and large engines.¹⁵⁴ However, even if these particular technologies are not directly applicable to the older generator engines proposed for use by Shell, it is still possible that the use of CDPFs is potentially feasible for these engines. Nothing in the permitting materials indicates with certainty that this particular technology is technically infeasible. Without such firm evidence EPA must insist that Shell perform the needed investigations to make a more solid determination.

4. PM BACT analysis for the incinerator.

¹⁵¹ EPA 420-S-06-002, Diesel Retrofit Technology: An Analysis of the Cost-Effectiveness of Reducing Particulate Matter Emissions from Heavy-Duty Diesel Engines Through Retrofits, March 2006, p. ii (Attachment 14).

¹⁵² EPA Stmt of Basis at 78-79: “D.E.C. Marine stated that they are not aware of any applications of CDPF systems on older heavy duty marine engines without modern electronic controlled fuel injection.”

¹⁵³ See, e.g., EPA’s Emerging Technology list available at: <http://www.epa.gov/otaq/diesel/prgemerglist.htm> (Attachment 15).

¹⁵⁴ Gekas I P, “NO_x Reduction Potential of V-SCR Catalyst in SCR /DOC/DPF Configuration Targeting Euro VI Limits from High Engine NO_x Levels”, Society of Automotive Engineers (SAE), Document Number: 2009-01-0626, April 2009 (Abstract available online at <http://www.sae.org/technical/papers/2009-01-0626>) (Attachment 16); Servati H B, Petreanu S, Marshall S E, Su H, Marshall R, Wu C-H, Hughes K, Simons L, Berrimann L, Zabsky J, Gomulka T, Rinaldi F, Tynan M, Salem J, Joyner J, “A NO_x Reduction Solution for Retrofit Applications: A Simple Urea SCR Technology”, SAE, Document Number: 2005-01-1857, April 2005 (Abstract available online at <http://www.sae.org/technical/papers/2005-01-1857>) (Attachment 17).

EPA is continuing to propose "Good Combustion Practices" as BACT for the incinerator.¹⁵⁵ This is the same BACT as proposed by Shell in its application.¹⁵⁶ EPA eliminated the use of add-on controls for the incinerator as technically infeasible. The Discoverer incinerator (TeamTec GS500C) is a small waste incinerator rated at 276 lb/hr, with a daily rating of 6,624 lbs/day. Shell plans to incinerate domestic and other non-hazardous solid waste (trash) and liquid sewage sludge. Shell describes this incinerator as a two-stage, batch-charged unit. The TeamTec GS500C unit is a small unit (approximately 8'x 6'x 7' in dimension) with an option for simultaneous combustion of sewage sludge and solid waste.¹⁵⁷

Shell requested Owner Requested Restriction (ORR) limits for PM₁₀ (8.2 lbs/ton) and PM_{2.5} (7 lb/ton), which is a small fraction of the total AP-42, Table 2.2-1 PM_{total} emission factor for an uncontrolled multiple hearth sewage sludge incinerator (100 lb/ton). It is not clear how fine particulate matter will be controlled to this level without the use of additional controls.

Shell has also requested an ORR of 1,300 lb/day (20% incinerator capacity) in addition to the ORR limits for PM₁₀ and PM_{2.5}.¹⁵⁸ Even at these ORRs the incinerator PM_{2.5} emissions account for up to 30% of the 24-hour PM_{2.5} (and PM₁₀) concentrations at maximum impact locations under Alternative Operating Scenario #2.¹⁵⁹

Both Shell and EPA conclude that no additional control is BACT, but do not explain how these ORR emission factors will be achieved absent additional control. Vendor data and source test data is absent to confirm these ORRs can be achieved. We support the EPA's requirement to test the incinerator (FD-23) to verify whether emission limits can be achieved (Condition K.9); however, these data are needed prior to issuing a permit to set a BACT limit and determine BACT.

The permit does not include an alternative procedure if the test fails to achieve the ORRs. One option would be to further reduce the incinerator throughput, but it is not clear whether further reduction below a 20% operating capacity can support the vessel's waste generation. Another option would be to develop alternative waste handling strategies to reduce waste capacity including collection and backhaul, if needed, rather than on-site incineration. These alternative requirements should be clearly specified in the permit.

¹⁵⁵ EPA Stmt of Basis at 85; EPA draft OCS PSD Proposed Permit Shell for Beaufort Operations at Condition K.2.

¹⁵⁶ Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, ENVIRON Project No. 03-22090A, Revised January 2010, p. 96.

¹⁵⁷ TeamTec Marine Product Brochure (Attachment 18).

¹⁵⁸ EPA Proposed Permit Condition K.7.1

¹⁵⁹ Shell Supplemental Materials for the Chukchi Sea permit at Table 7-4 Discoverer Source Contributions at the Screening Maximum Impact Locations (9/17/09).

We request that EPA require Shell test this incinerator to verify what emission rate can be achieved, or provide vendor data to verify that the PM₁₀ (8.2 lbs/ton) and PM_{2.5} (7 lb/ton) ORRs can be met without any additional emission control. Additional control may be required to achieve these emission levels. Or alternative waste handling strategies may need to be adopted.

In the event that the test data for the unit demonstrate the ability to meet lower PM₁₀ and PM_{2.5} limits, EPA must revise the BACT limits accordingly. In fact, Shell's own findings in the RACT/BACT/LAER clearinghouse demonstrate that lower limits can be achieved on similar-sized units using "Proper Operation and Maintenance" practices. Specifically, similar waste combusting units permitted at the Kenai Refinery in Alaska with 350 lb/hr maximum throughput ratings have a BACT limit for PM₁₀ of 0.2 lb/hr, or 1.1 lb/ton.^{160,161} EPA should consider and evaluate this limit as an applicable BACT limit for the incinerator on the Discoverer.

We commend EPA for requiring a standard operating procedure/waste separation plan to instruct employees on how to segregate waste to ensure that hazardous/toxic material is not inadvertently incinerated (Proposed Permit Condition K.8).

5. Incinerator SO₂ emissions.

Shell references an owner requested limit as the source of its emission factor for SO₂ emissions from the incinerator.¹⁶² However, this number appears to be based on AP-42, Table 2.1-12 yet it is not clear why Shell uses this "D" rated emission factor for a refuse combustor of 2.5 lbs/ton rather than the "B" rated emission factor of 28 lb/ton found in Table 2.2-1 for a multiple hearth sewage sludge incinerator (which is 11 times larger).¹⁶³ If Shell has reduced this emission factor based on fuel type, this must be explained.

6. Incinerator sewage combustion.

We request that EPA clarify the amount and type of sewage that will be incinerated in Discoverer incinerator versus treated by the Marine Sanitation Device (MSD) and discharged overboard as described in Shell's NPDES NOI. In our comments on the NPDES permit, we have requested additional information on the type and treatment levels achieved by the Marine Sanitation Device (MSD).

7. PM BACT analysis for boilers.

¹⁶⁰ RBLC, AK-0053, 3/21/2000

¹⁶¹ $0.2 \text{ lb}_{\text{PM}_{10}}/\text{hr} / 350 \text{ lb}_{\text{waste}}/\text{hr} * 2000 \text{ lb}/\text{ton} = 1.1 \text{ lb}_{\text{PM}_{10}}/\text{ton}_{\text{waste}}$

¹⁶² per Shell 5/18/2009 Response to EPA R10 March 11, 2009, Letter of Incompleteness, Attachment D, Page 3.

¹⁶³ EPA Chukchi Stmt of Basis Appendix A.

EPA is proposing "Good Combustion Practices" as BACT for the two boilers onboard the Discoverer.¹⁶⁴ EPA eliminated the use of add-on controls for the boilers as technically infeasible.

As with the incinerator, we support EPA's requirement to test the boilers (FD-21 and FD-22) to verify that BACT emission limits can be achieved (Condition J.5); however, these data are needed *prior* to issuing a permit to set a BACT limit and determine BACT. We request that EPA require Shell test both units to verify what emission rate can be achieved, or provide vendor data to verify that the PM₁₀ (0.0235 lb/mmBTU) and PM_{2.5} (0.0235 lb/mmBTU) limits can be met without any additional emission control.

In the event that the test data for the units demonstrate the ability to meet lower PM₁₀ and PM_{2.5} limits, EPA must revise the BACT limits accordingly. EPA must also explain why the proposed BACT limits exceed AP-42 emission factors for this source. Table 1.3-1 in Section 1.3 of EPA's AP-42 compilation of emission factors lists "A" rated emission factors for NO_x and PM₁₀ of 20 pounds per thousand gallons (lb/10³gal) and 2 lb/10³gal, respectively.¹⁶⁵ AP-42 emission factors represent an average of a range of emission rates. Therefore, units applying BACT would presumably be able to achieve much lower emission rates than what is presented as the average factor in AP-42. The proposed BACT limits for the two boilers, in comparison, are equivalent to 26.6 lb/10³gal of NO_x and 3.1 lb/10³gal of PM.¹⁶⁶ EPA must explain why the boilers on the Discoverer will not have BACT limits at least as stringent as the average emission rates established in AP-42.

8. VOC BACT analysis for vented sources.

EPA's Proposed Statement of Basis at Section 4.1 concludes that "... BACT must be determined for *each emission unit on the Discoverer* which emits NO_x, PM, PM_{2.5}, PM₁₀, SO₂, VOC and CO while the drillship is operating as an OCS source." [emphasis added]. EPA's Statement of Basis at Section 4.6 examines VOC BACT for vented sources of VOC (e.g. mud degassing).

¹⁶⁴ EPA Chukchi Stmt of Basis at 65; EPA draft OCS PSD Proposed Permit for Shell Chukchi Operations at Condition J.2.

¹⁶⁵ AP-42 emission factors are given a rating of "A" through "E" with "A" indicating a high level of confidence in the factor ("A" = Excellent. Factor is developed from A- and B-rated source test data taken from many randomly chosen facilities in the industry population. The source category population is sufficiently specific to minimize variability. Tests are performed by a sound methodology and are reported in enough detail for adequate validation).

¹⁶⁶ Proposed Permit Conditions J.1.1 and J.1.3 list a NO_x BACT limit of 0.2 lb/mmBTU and a PM₁₀ BACT limit of 0.0235 lb/mmBTU, respectively. Based on the diesel fuel heating value in Shell's engineering calculations (Appendix A of EPA's Statement of Basis) of 0.1331 mmBTU/gal:

$$0.2 \text{ lb/mmBTU} * 0.1331 \text{ mmBTU/gal} * 1000 \text{ gal}/10^3 \text{ gal} = 26.6 \text{ lb}/10^3 \text{ gal NO}_x$$

$$0.0235 \text{ lb/mmBTU} * 0.1331 \text{ mmBTU/gal} * 1000 \text{ gal}/10^3 \text{ gal} = 3.1 \text{ lb}/10^3 \text{ gal PM}_{10}$$

Mud degassing emissions can substantially contribute to VOC and greenhouse gas (GHG) emissions. Mud degassing systems are used to remove entrained formation gas from the mud to maintain higher mud density for well control. Drilling mud degassing units extract entrained gas from the mud at the surface and vent this gas directly into the atmosphere. Shell proposes to vent this gas directly to atmosphere through a 10” vent pipe. Shell concludes that it is not affordable to install a 2” flare nozzle atop the 10” mud degassing vent line to control the emissions, because the flare would cost \$61,800. Shell estimates *only 128 lbs* of VOC are vented during the entire *drilling season*¹⁶⁷ resulting in an emission control cost of \$965, 625 per ton. Based on Shell’s very low emission estimate, EPA agreed no control would be required. Shell’s extremely low emission estimate is not only inconsistent with MMS and industry emission factors, but is inconsistent with the need for a 10” vent pipe. Why would a 10” vent pipe be needed for such an extremely low flow rate? Clearly, Shell’s engineers recognize the Potential To Emit (PTE) is substantially higher.

We reviewed EPA’s record on this BACT assessment in detail, and did not find any review of the published MMS emission factor for offshore drilling mud degassing systems that NSB identified and requested EPA to review in our last set of comments (on the Chukchi permit). As we previously explained, in 2007, MMS hired a consulting firm to develop offshore drilling mud degassing emission factors, among other emission factors, to improve offshore oil and gas emission estimates.¹⁶⁸ MMS’s drilling mud degassing emission factors have been reviewed and accepted by both API¹⁶⁹ and The Climate Registry.¹⁷⁰ The standard total hydrocarbon (THC) emission factor for water-based mud from an offshore drilling mud system is *881.84 lb* THC/drilling day. The standard methane (CH₄) emission factor from an offshore drilling mud system is 0.2605 tons of CH₄ per drilling day.

Again, we request that EPA require Shell to revise its mud degassing emission computations using standard emission factors developed by MMS, accepted by the American Petroleum Institute and The Climate Registry. Shell’s computations use a non-standard approach. Shell’s emission estimate severely underestimates the GHG emission impact¹⁷¹ and VOC emission contribution.

¹⁶⁷ EPA Stmt of Basis, at Section 3.4.12, Drilling Mud System (FD-32).

¹⁶⁸ Wilson, Darcy, Richard Billings, Regi Oommen, and Roger Chang, Eastern Research Group, Inc. *Year 2005 Gulfwide Emission Inventory Study*, U.S. Department of the Interior, Minerals Management Services, Gulf of Mexico OCS Region, New Orleans, December 2007, Section 5.2.10 (available at: <http://www.gomr.mms.gov/PI/PDFImages/ESPIS/4/4276.pdf>) (Attachment 19).

¹⁶⁹ American Petroleum Institute (API), *Compendium of Greenhouse Gas Emission Methodologies for the Oil and Natural Gas Industry*, August 2009 (Available at: http://www.api.org/ehs/climate/new/upload/2009_GHG_COMPENDIUM.pdf).

¹⁷⁰ The Climate Registry Oil and Gas Production Protocol, Draft for Public Comment, May 2009 (available at: <http://www.theclimateregistry.org/downloads/2009/05/Oil-and-Gas-Production-Protocol.pdf>).

¹⁷¹ NOTE: Methane is of particular concern as a greenhouse gas since it is over 20 times more effective at trapping heat in the atmosphere than carbon dioxide over the same 100-year period.

If the MMS emission factor of 881.84 lb /drilling day is used over the 168 day drilling period (74 tons) the flare is cost effective at \$834 per ton. Additionally the VOC estimate needs to be revised upward to reflect this higher number as well. We also request that EPA require Shell to calculate HAP emissions based on the substantially higher, revised VOC emission estimate.

If EPA has concerns about the quality of MMS's emission estimate, please explain what those concerns are, and provide an alternative emission factor that is more accurate. Or require Shell to test the vent to verify actual emissions.

B. A Proper BACT Analysis Must Include the Ancillary Vessels.

As described above, under NSB's proposed Option 3 additional vessels would be considered part of the OCS source subject to regulation by EPA. We ask that Shell and EPA utilize the top-down approach for applying BACT to these vessels.

In doing so, the fact that equipment (including vessels) are leased by Shell cannot serve as adequate grounds for concluding that applying emissions controls would be economically infeasible. Both the CAA and EPA's regulations apply to "owners *or operators*,"¹⁷² as well as "any equipment, activity, or facility."¹⁷³ Thus, it is not enough that the equipment is not owned by Shell since Shell is the operator. At the very least, Shell and EPA must disclose the costs to Shell of owning such equipment versus the costs of leasing it, what the savings are, and in light of all those figures whether it is economical to apply control technologies.

Just as in the draft permit for the Chukchi operations, EPA has failed to apply BACT to the Discoverer's propulsion engine and several of the support vessels, including Icebreaker #2. We applaud EPA for taking steps to require additional pollution control that will further reduce emissions. But these increased control requirements still do not reflect EPA and Shell's legal obligations under the CAA to apply BACT analysis to all of the vessels that operate within 25 miles of the OCS source. Thus, EPA must apply BACT to all of Shell's sources, including all ancillary vessels.

EPA has determined that Icebreaker #2 is not "physically attached" to the Discoverer during the anchoring process, despite the fact that the two vessels are physically connected with an anchor line.¹⁷⁴ To reach this conclusion, EPA relied on the common meaning of "attached" but ignored common sense in applying the definition to the facts. EPA cites *The American Heritage Dictionary of the English Language*, 4th ed., (2006) for the definition of "attached" which is "to fasten, secure or join" or "to connect as an

¹⁷² 42 U.S.C. § 7475 (emphasis added); 40 C.F.R. §§ 52.21(n), (o).

¹⁷³ 42 U.S.C. § 7627(4)(C); 40 C.F.R. § 55.2.

¹⁷⁴ EPA Re-Proposed Stmt. of Basis at 24, FN 8.

adjunct or associated condition or part."¹⁷⁵ EPA claims that the anchor line running between the vessels was not designed "to fasten . . ." or "to connect . . ." within the plain meaning. Regardless of the anchor line's design or intent, the anchor line in fact physically connects the vessels during the anchoring process. Because the vessels are physically connected, Icebreaker #2 falls within the plain meaning of "attached" and thus within the meaning of OCS source. Consequently, EPA must regulate Icebreaker #2 as an OCS source.

VII. Specific Comments on Permit Conditions, Compliance Demonstration, Monitoring and Reporting Measures.

A. Source Testing.

We strongly support EPA's requirements to verify that emission limits can be met by stack testing each emission unit.¹⁷⁶ Stack test data are critical to verify if permit limits can be met. While the stack testing requirements in the proposed permit are not as comprehensive as the original proposed permit requirements for Shell's Chukchi Sea PSD permit, the requirements are a substantial improvement over Shell's 2007 permit and we applaud EPA's more stringent emission verification approach.

We do not agree, however, that the reduced stack testing requirements be based on an operating range representing the most frequently-used loads. Rather, if EPA proceeds with less frequent testing for certain engines we strongly urge EPA to ensure that established load ranges will reflect maximum emissions scenarios. This is especially important for source testing of PM_{2.5} emissions since compliance is demonstrated on a short-term averaging time.

Shell's September 17, 2009 comments to EPA on the proposed Chukchi permit at p.9, request that EPA *remove* the stack test requirements for the: MLC Compressor Engines, HPU Engines, Cranes, Cementing and Logging Units, the Boilers and Utility Generators. Shell proposed that EPA rely on generic, average emission factors for these units, without any stack testing. We fully support EPA's decision to keep these critical stack testing requirements for Shell's operations in the Chukchi and Beaufort Seas. We urge EPA to maintain the original, more comprehensive, testing requirements for a broader range of loads, as proposed in the original Chukchi permit, but support testing over a fewer number of load ratings over elimination of testing all together. We would like for EPA to assure that, if fewer tests are required, they be performed at loads that are most likely to result in maximum emissions, especially for source testing of PM_{2.5} emissions.

¹⁷⁵ *Id.*

¹⁷⁶ See Proposed Permit Conditions: C.6 (Generator Engines), F.6 (MLC Compressor Engines), G.8 (HPU Engines), H.7 (Deck Cranes), I.7 (Cement Unit and Logging Winch), J.5 (Boilers), K.9 (Incinerator), L.4 (Supply Ship), O.10 (Icebreaker #1), P.12 (Icebreaker #2), and R.7 (Oil Spill Response Fleet).

We do not agree with Shell's assertion that the impacts of these particular engines are small.¹⁷⁷ The HPU engines, in particular, contribute almost one-quarter of the impact to maximum PM_{2.5} concentrations and 30% of the impact to maximum NO₂ concentrations. This is the second largest contributor to both PM_{2.5} and NO₂ impacts of all sources. The cementing units contribute over one-third of the impact to maximum NO₂ concentrations and the deck cranes contribute one-fifth of the impact. All told, these engines, combined, make up over 40% of the impact to maximum concentrations of PM_{2.5} and over 85% of the impact to maximum concentrations of NO₂.¹⁷⁸ Given that Shell's exploration activities in the Beaufort Sea are projected to consume over 75% of the available PSD Class II increment for NO₂, close to 70% of the 24-hour PM₁₀ Class II increment and 83% of the 24-hour PM_{2.5} NAAQS it is critical that the largest contributors to these pollutant concentrations be required to verify that they can meet permit limits using stack testing – specifically, the main drill rig engines, HPU engines, cementing units and boilers for PM₁₀ and PM_{2.5} and the HPU units, cementing units and deck cranes for NO_x.

Shell describes testing for these units to be “difficult, expensive and time-consuming” but nothing in their supplemental materials describes a situation that is impossible, even for the deck crane units.¹⁷⁹ Considerations of cost and convenience are not sufficient to preclude source testing of these engines. In fact, most of Shell's difficulties arise from testing during operation when, in fact, testing prior to operation is critical so that any needed modifications can be made to remedy failed tests. We support testing for all of these engines, including deck cranes, prior to operation and at loads reflective of maximum emission scenarios.

We also do not support the removal of stack testing requirements for the icebreakers. In particular, we think it's critical to include stack testing at 20% load for Icebreaker #1 unless EPA will be adding a permit requirement limiting operation time of Icebreaker #1 at 20% load. Icebreaker #2 is still required to perform source testing at four loads, including 20% load, and we see no reason why Icebreaker #1 should not be subject to the same testing requirements (see Permit Condition P.12.1). In fact, Shell indicates in its supplemental materials for the Chukchi permit that a 20% load often results in higher emission factors.¹⁸⁰ Without more assurance that Shell does not operate its icebreakers at these lower loads EPA must assume the icebreakers could, in fact, operate at these loads and must include permit conditions to test at these higher emission rate levels.

The proposed permit requires stack testing to be completed prior to each drilling season, but does not specify how far in advance the testing must be done, nor does the permit

¹⁷⁷ November 23, 2009 letter from Shell to EPA Re Shell Preconstruction PSD Permit Application, Chukchi Sea, Alaska - Supplemental Application Support Materials in Response to November 17, 2009 Coordination and Consultation Meeting with Region 10

¹⁷⁸ September 19, 2009 letter from Shell to EPA Re Shell Gulf of Mexico Inc. comments on the August 2009 Proposed Discoverer / Chukchi OCS/PSD Permit to Construct, Table 7-4.

¹⁷⁹ *Id.* 191 at 10.

¹⁸⁰ *Id.* 192 at 9.

include a remedy for failed tests. Proposed Permit condition B.20.9 requires all stack test results to be provided to EPA within 45 days of testing. But if stack testing only occurs a few days prior to the drilling season, there will not be adequate time to analyze and remedy any test results that exceed the permit limits before drilling starts. With a 168 operating day limit per drilling season, a quarter of the drilling season could pass before EPA even receives the test results.

We request that EPA require all stack tests to be completed at least 180 days prior to each drilling season to ensure there is adequate time to analyze and remedy any test results that exceed permit limits. The permit must clearly state that any emission unit that fails to meet the permitted emission limit must not be operated until the unit is repaired or additional emission control is installed. Collecting test data, and merely reporting excess emissions if tests fail to meet permit limits, is not an acceptable solution, especially in the cases where the annual NO_x and 24-hour PM_{2.5} compliance margins are very tight. A failed test, unresolved, could result in a NAAQS or increment exceedance. This is a very important point that was raised in our comments on the Chukchi permit; yet, EPA continues to not allow adequate time between testing and commencement of operations to address potential problems.

EPA's proposed permit included several conditions where one unit is tested to represent the emission performance of other like units (e.g. Condition C.6 that requires two of the Discoverer generator engines to be tested in the first year to represent the emissions of all six engines). In these cases, the permit must clearly state that if the representative unit fails the stack test, all like emission units correspondingly are assumed to have failed. All like units must be repaired or additional emission controls must be installed to meet the limit. Alternatively, additional stack tests on the remaining units could be performed to verify individual unit compliance to isolate the problem unit(s). We recommend that EPA evaluate information on the unit year, model type and historical use to demonstrate that the equipment is of like equipment specification and has a similar operating history. EPA must demonstrate that the units are representative, or it must require each unit to be tested individually before the first drilling season.

EPA does not require source tests for the Discoverer's main propulsion engines. We question whether the main propulsion engines would actually be completely shutdown when the Discoverer is operating as an OCS source.¹⁸¹ If, under further examination, EPA determines the propulsion units will be operated under the Option selected by EPA for the OCS definition, source testing should be required.

1. Load factors, testing and monitoring.

Shell's application includes a number of assumed operating loads. Emissions are a function of load. EPA's proposed permit accepts these assumed loads and requires stack testing within the expected operating range (see, e.g., Conditions C.6.2, F.6.2, G.8.2, etc.). The proposed permit ensures that calculated emission rates used for compliance

¹⁸¹ See, *supra* at 12-15.

demonstration are based on the maximum emissions scenario for the range of loads tested, except for the boilers on the Discoverer. We request EPA revise the following permit condition to be more explicit regarding this point for the boilers. We request permit condition J.5.4 read:

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

Condition J.6.5 then requires the use of the highest emission factor calculated in the corresponding section (revised above) and will ensure all loads are considered when making this calculation of highest emissions.

We request that EPA include a recordkeeping requirement to track the operating loads during the first drilling season to verify actual operating load ranges. The permit should also include requirements for additional stack testing if actual operating practices include operating loads outside the currently assumed ranges.

B. Fuel and Electrical Output Monitoring.

We strongly support the compliance demonstration requirements for fuel monitoring in the proposed permit for the MLC compressor engines (FD 9-11), HPU engines (FD 12-13), deck cranes (FD 14-15), Cementing Units and Logging Winches (FD 16-20), Heat Boilers on the Discoverer (FD 21-22) and on the Icebreakers and for the Oil Spill Response fleet propulsion and non-propulsion engines (FD-N 1-4). We also support the requirement that fuel flow meters measure the fuel flow rate with an accuracy equal to or better (less) than two percent of the meter's upper range value (see, e.g., Condition F.7.1.3).

Since the emissions inputs for the modeling analysis are based, in general, on multiplying the applicable emission factor by the associated operating factor (e.g., fuel usage rate) then the accuracy of this input is determined by the sum, in quadrature, of the fractional uncertainties associated with each factor.¹⁸² If, as is indicated in Shell's September 17, 2009 comments (p. 11) on the its Chukchi permit, the uncertainty in the stack test data is upwards of 15%, then Shell must be able to demonstrate compliance with the NAAQS considering a margin of error no less than 15%.¹⁸³ This would mean the predicted 24-hour PM_{2.5} concentration would need to be less than 29.8 µg/m³ when considering the applicable background concentration. In fact, the highest predicted 24-hour PM_{2.5} concentration from the permit modeling was 29.2 µg/m³ with a background concentration of 10 µg/m³.¹⁸⁴ EPA must establish permit limits that, when considering the accuracy of

¹⁸² The quadrature sum is the square root of the sum of the squares.

¹⁸³ The uncertainty in the calculated emission rate would be the square root of the sum of the squares of the fractional uncertainties, as follows:

$$q = ((2\%)^2 + (15\%)^2)^{1/2} = 15.1\%$$

¹⁸⁴ EPA Stmt of Basis, Table 5-14.

the emission factor and operating data, demonstrate compliance with the NAAQS with a margin of error no less than the accuracy of the input data.¹⁸⁵

EPA's proposed permit allows load monitoring to replace fuel monitoring for the Discoverer generator engines (FD 1-6) and for the internal combustion engines on its support icebreakers. Shell states load monitoring systems are already installed on these vessels, and are more accurate than fuel monitoring systems. While Shell has installed load monitoring capability on the currently contracted vessels, it has requested flexibility in Icebreaker #1 selection for future operating years, and, must explain how it will provide equivalent capability on future contract vessels.

The use of load monitors in place of fuel monitors means compliance assurance also rests on the accuracy of the assumed generator efficiency. Shell's supplemental materials claim that "typical generators convert over 90% of the energy coming from the engine into electrical load" and, further, that "any error in the assumed efficiency is likely to be on the order of 1-2%."¹⁸⁶ Shell then provided five examples of generator efficiencies that reflect engine generator sets of the same sizes as those proposed for the Shell project and that ranged from 92%-96%. EPA based its electrical power output limits for these units on an assumed efficiency of 92%. EPA justified the use of the low end of the efficiency range due to "the apparent age of the Discoverer's gensets and the lack of specific information regarding the efficiencies of the Discoverer's gensets."¹⁸⁷ Because of this and because the specifics of Icebreaker #1, in particular, are unspecified, we believe that an assumed generator efficiency of 90% would be more prudent. Without more specifics on the actual gensets used and because compliance with the PM_{2.5} NAAQS is just barely demonstrated when considering the accuracy of the input data, EPA must consider the most conservative approach to ensuring compliance. Alternatively, EPA could require a minimum generator efficiency (based on technical data for the actual gensets used) of 92% and include a corresponding permit condition and compliance demonstration requirements to ensure this minimum efficiency.

C. Relief well emissions.

EPA's proposed permit condition B.2.3 requires Shell to include any time spent drilling a relief well in the total 168 day operating period. We agree that the time needed to drill a relief well should be deducted from the total 168 day operating period. We also agree that relief well drilling emissions must be included in PTE calculation.

Shell does not specify the time it will take to drill a relief well in the air permit application, but does conclude in its Beaufort Sea Oil Discharge Prevention and

¹⁸⁵ As determined by the sum, in quadrature, of the fractional uncertainties for each variable.

¹⁸⁶ November 23, 2009 letter from Shell to EPA Re Shell Preconstruction PSD Permit Application, Chukchi Sea, Alaska - Supplemental Application Support Materials in Response to November 17, 2009 Coordination and Consultation Meeting with Region 10, p. 7 of 18.

¹⁸⁷ EPA Stmt of Basis at 46.

Contingency Plan (ODPCP) that a blowout can be controlled using the M/V Discoverer within a 34 day period.¹⁸⁸

We request that EPA revise permit Condition B.2.3 to read:

*A 34 day period **must be reserved** out of the total 168 operating period to drill a relief well. All exploratory well drilling (planned wells and sidetracks) must be completed within 134 days, reserving at least a 34 day period to drill a relief well. Any time spent drilling a relief well shall be included in the time recorded in Conditions B.2.2.3 and B.2.2.4. If the relief well exceeds a 34 day period, excess emissions must be reported.*

If that time is not reserved, and a relief well is drilled increasing the drilling days beyond 168 days (+34 days), an air quality violation is likely to occur.

D. Sulfur content of diesel fuel.

We commend Shell's actions to commit to the use of Ultra Low Sulfur Diesel Fuel (ULSD) for its OCS exploration activities in the Beaufort and Chukchi Seas north of the Bering Strait. The huge reductions in anticipated sulfur dioxide emissions that will result from this commitment is significant and will reduce not only localized emissions of SO₂ but will reduce PM_{2.5} pollution from the project, as well. Specifically, on December 9, 2009 EPA received notice of the following:

“Shell hereby commits to using only ultra-low-sulfur diesel (15 ppm) in any engine on the Discoverer (including its propulsion engines) and in any engine on any vessel in the associated fleet when operating North of the Bering Strait.”¹⁸⁹

EPA's proposed permit, however, does not include a requirement to use ULSD fuel in the propulsion engines of the Discoverer, as committed to by Shell.

EPA's proposed permit condition B.4 requires ultra-low sulfur fuel (15 ppm sulfur) on all emission units *except* the main propulsion engines (Unit FD-7). We request that the main propulsion engines be required to use ultra-low sulfur fuel (15 ppm sulfur) in accordance with Shell's December 9, 2009 commitment and with EPA's June 6, 2006 Final Rule: Control of Air Pollution from Motor Vehicles and Nonroad Diesel Engines: Alternative Low-Sulfur Diesel Fuel Transition Program for Alaska.¹⁹⁰

¹⁸⁸ Shell Chukchi Sea ODPCP at 1-23, 4-7 (available at:

http://www.mms.gov/alaska/ref/ProjectHistory/2009_Chukchi_Shell/2009_0623_Shell_cplan.pdf) (Attachment 13).

¹⁸⁹ December 9, 2009 letter from Shell to EPA Re Shell Gulf of Mexico Inc. Supplement to Application for Discoverer/Chukchi OCS/PSD Permit

¹⁹⁰ 71 Fed. Reg. 32450-32464 (June 6, 2006).

EPA's proposed permit condition B.4 requires testing to verify the ultra-low sulfur fuel (15 ppm sulfur) limit is met; however, EPA's proposed permit condition B.4.3 appears to allow Shell to burn fuel that exceeds the 15 ppm limit as long as any exceedance is reported to EPA. We request that proposed permit condition B.4.3 be revised to clarify that fuel that does not meet the 15 ppm standard cannot be used, and must be returned to the supplier. We do not find it acceptable to merely test the fuel sulfur content, and report any exceedances as a BACT approach. We request that EPA enforce its requirement to limit all actual fuel use to 15 ppm sulfur. Fuel that does not meet that standard should be returned to the supplier.

Condition B.4 should be revised to read:

The permittee shall not combust any liquid fuel with sulfur content greater than 0.0015 percent by weight, as determined by Condition B.4.1, in any emission unit on the Discoverer (including its propulsion engines).

Conditions B.4.3 and B.5.3 should be revised to read:

Fuel tests must verify the fuel sulfur content is 15ppm or less for that fuel to be used. Fuel exceeding 15ppm fuel sulfur must be returned to the supplier, unused.

EPA's June 6, 2006 Final Rule: "Control of Air Pollution from Motor Vehicles and Nonroad Diesel Engines: Alternative Low-Sulfur Diesel Fuel Transition Program for Alaska"¹⁹¹ requires marine vessels to comply with a 15 ppm fuel sulfur standard on June 1, 2010. Shell's proposed 2010 operations, therefore, need to comply with this standard.¹⁹² The final rule states:

Beginning June 1, 2010, diesel fuel used in these applications must meet a 15 ppm (maximum) sulfur content standard.

In 2010, highway and nonroad fuel in rural Alaska will be required to meet the 15 ppm sulfur standard, providing the full environmental benefits of these programs to rural Alaska as well.

The permanent exemption from the 500 ppm sulfur standard of 40 CFR 80.29 for rural Alaska terminates on the implementation date of the new 15 ppm sulfur standard in 2006.

On September 14, 2003, Alaska ... requested that the **15 ppm standard** applicable to locomotive and **marine diesel fuel produced in, imported into, and distributed or used within rural Alaska be moved up to June 2010**, from the June 2012 date in the final nationwide NRLM rule.

¹⁹¹ 71 Fed. Reg. 32450-32464 (June 6, 2006).

¹⁹² EPA, Regulatory Announcement <http://www.epa.gov/otaq/regs/fuels/diesel/420f06040.htm> (Attachment 20).

This rule specifies one exception to the nationwide NRLM standards and implementation deadlines in effect for diesel fuel produced in, imported into, and distributed or used within rural Alaska, beginning June 1, 2010. *This exception is that locomotive and marine diesel fuel will also be required to meet the 15 ppm sulfur content standard on June 1, 2010* rather than in 2012.

This rule further specifies that the 15 ppm sulfur standard applicable to locomotive and marine fuel (LM) be moved forward to 2010 to be implemented at the same time as the 15 ppm sulfur standard for nonroad (NR) diesel fuel. In this way there will only be one grade of NRLM¹⁹³ diesel fuel in the rural areas in 2010 and 2011 instead of two separate grades (i.e. 15 ppm and 500 ppm). The implementation dates for the NRLM diesel fuel sulfur standards are shown in Table II.B-1. [Table II.B-1 shows refiners and importers of fuel must meet the 15 ppm fuel sulfur standard on June 1, 2010.]¹⁹⁴

E. Bow Washing, Anchor Setting and Retrieving and Resupply Requirements for the Icebreaker Vessels

EPA's proposed permit includes requirements for bow washing for Icebreaker #2 in Permit Condition P.9. Specifically, the permit requires Shell to record the date, hour and minute that Icebreaker #2 begins and ends its bow washing operations. The permit should limit the bow washing operations to an hour since this was the basis for the modeling analysis and EPA makes it clear in the Statement of Basis that this is a maximum timeframe needed for bow washing activities.¹⁹⁵ Similarly, EPA must also include a permit requirement limiting the total travel and idle time during icebreaker #1 resupply to two hours and during anchor handler (icebreaker #2) resupply to one hour.¹⁹⁶

During anchor setting and retrieval, EPA states that “[d]rilling is not expected to occur during this process, so several of the Discoverer’s emission sources are not modeled, and the anchor handler’s main engines are assumed to be at 20% load.” If EPA is basing its modeling demonstration on certain Discoverer emission sources not operating during anchor handling and retrieval and is assuming the icebreaker #2’s main engines are operating at 20% load then EPA must include enforceable permit conditions prohibiting operation of those sources and limiting operating loads to ensure that what was modeled represents actual operations.

F. Tanker Requirements

¹⁹³ Nonroad, Locomotive and Marine (NRLM).

¹⁹⁴ 71 Fed. Reg. 32450-32464 (June 6, 2006) (emphasis added).

¹⁹⁵ EPA Stmt of Basis at 58.

¹⁹⁶ EPA Stmt of Basis at 118.

EPA's proposed permit does not include any specific requirements for the tanker that will accompany the drilling fleet. According to the Statement of Basis, "[a] tanker is expected to accompany the drilling fleet at the distance of at least 25 miles from the Discoverer. It will not be approached the Discoverer. The tanker will be either the *Affinity* of a similar vessel. The 228-meter *Affinity* uses Distillate Marine C oil, similar to No. 4 oil."¹⁹⁷ EPA completed a modeling analysis of the tanker's impacts based on the above assumptions for the vessel. EPA must include a provision in the permit prohibiting the tanker from operating within 25 miles of the Discoverer and must also specify the *Affinity* or a vessel that would have a similar impact to the *Affinity* and fuel requirements for the vessel that would ensure compliance with all NAAQS and increment standards.

G. COA Regulation for Ice Fog Standards

EPA must address the Corresponding Onshore Area ice fog standards in 18 AAC 50.080 and in Appendix A of 50 CFR 55. All fuel-burning and incinerator emission units on the Discoverer and the associated support fleet in an area of potential ice fog must be required to obtain a permit and reduce water emissions. EPA must include an analysis of this COA regulation as it applies in the Inner OCS and include the needed permit conditions in the final permit.

H. Prohibited activities.

Proposed Permit condition B.21 prohibits flowing test wells, flaring gas and storing liquid hydrocarbons. This condition should also prohibit venting formation gas unless those emissions are accounted for in the permit and BACT is applied. EPA must clearly prohibit gas venting or properly account for it.

I. EPA's proposed OCS/PSD permit must include requirements to make enforceable Shell's statements regarding the exploratory drilling program that were made in its permit application.

EPA's proposed permit for Shell's exploration activities in the Beaufort Sea includes important provisions to ensure that the permitted sources cannot be modified from the source parameters that were reflected in Shell's complete PSD permit application. EPA's proposed permit specifies the date of the PSD permit application, descriptions of the proposed sources that include the individual make and model, as well as the rated capacity. We strongly support the inclusion of these provisions and references to the representations made in the permit application in order to ensure that Shell cannot change its operation in ways that could change air pollutant dispersion or alter BACT analyses without limitation. As an added measure, we suggest that EPA include a provision in the permit stating that operation of the permitted sources must be in accord with the information provided in the PSD permit application submitted by Shell Offshore Inc. on January 18, 2010 and supplemented with the specific submittals identified in the official

¹⁹⁷ EPA Stmt of Basis at 122.

administrative record for the proposed permit action.

EPA must make it clear in the permit that if the required source tests show Shell's emission estimates are not in accordance with permit limits then the appropriate emission control must be installed *prior to the next season*. EPA would also, then, need to revise the ambient air modeling to ensure NAAQS and increment compliance.

Further, EPA must require notification of any deviations from the information included in the permit application materials, and must make clear that any significant deviation from the representations made by Shell in its PSD permit application may be grounds for suspension or revocation of the permit. These types of permit provisions are commonly required in PSD permits, and provide a necessary assurance to the public and tribal, state and federal regulatory agencies that operation of significantly different sources, or significant modifications of the proposed sources, cannot occur without further evaluation.

VIII. Comments on the Ambient Air Quality Analysis and Supporting Data.

A. Ice management and anchor handling fleet.

EPA's proposed permit specifies the Tor Viking or Hull 247 as the anchor handler (Icebreaker #2) but allows for the use of a generic ice management vessel (Icebreaker #1). Under the proposed permit conditions, Shell can use generic parameters for capacity (see, e.g., Conditions O.1.1 through O.1.4), emission rates (Conditions O.1.5 and O.1.6) and limits for volume source release heights (e.g., Condition O.9). We are not convinced that merely capping the capacities of various vessel parameters, requiring the vessels meet certain emission rates for PM_{2.5}, PM₁₀ and NO_x and requiring a minimum volume source release height is enough to ensure that the use of different vessels will be able to ensure compliance with NAAQS. We continue to prefer that EPA require specific Ice Management vessels and establish permit limits and associated modeling requirements based on the use of those specific vessels. We strongly support the specific permit limits and modeling for the anchor handler (Icebreaker #2).

We support EPA's position that specific permit limits and associate compliance demonstration requirements are needed for the anchor handler in order to ensure that the vessel's emissions are, in fact, properly represented by AP-42 emission factors. This is particularly important given that there are no stack test data available for PM emissions from these, or similar, engines.¹⁹⁸ If EPA will be allowing the use of the much-lower AP-42 emission factors for the anchor handler then it must include associated emission limits in the final permit.

¹⁹⁸ See November 23, 2009 Shell Preconstruction Permit Application for Frontier Discoverer Drillship in Chukchi Sea, Alaska, beyond the 25-mile Alaska Seaward Boundary: Supplemental Application Support Materials Responding to R10 Pat Nair's Email and Discussion on November 17, 2009 in Seattle, Washington, p. 3 of 18.

The proposed permit requires stack testing of the support vessels to be completed prior to each drilling season (*see, e.g.*, Conditions O.10 and P.12), but does not specify how far in advance the testing must be done, nor does the permit include a remedy for failed tests.

Permit condition B.20.9 requires all stack test results to be provided to EPA within 45 days of testing. However, if stack testing only occurs a few days prior to the drilling season, there will not be adequate time to analyze and remedy any test results that exceed the permit limits before drilling starts. With a 168 operating day limit per drilling season, a quarter of the drilling season could pass before EPA even receives the test results. Permit conditions O.1.7 and P.1.7 require Shell to notify EPA no later than 45 days prior to deployment to the Beaufort Sea of the ice management vessels selected. EPA requires 30 days notice on the testing which would appear to result in testing occurring as little as 15 days before the start of the drilling season. EPA must coordinate these timetables so that adequate time is allowed for to remedy any failed tests of the specified vessels

We request that EPA require all stack tests to be completed at least 180 days prior to each drilling season to ensure there is adequate time to analyze and remedy any test results that exceed permit limits. The permit must clearly state that any emission unit that fails to meet the permitted emission limit must not be operated until the unit is repaired or additional emission control is installed. Collecting test data, and merely reporting excess emissions if tests fail to meet permit limits, is not an acceptable solution, especially in the cases where the annual NO_x increment and 24-hour PM_{2.5} NAAQS compliance margins are tight. A failed test, unresolved, could result in an air quality standard exceedance. EPA did not respond to this concern in the Chukchi permit, nor even evaluate optimized source test timing with Shell.

We remain concerned that ice management activities may be underestimated in the proposed permit analysis. EPA has not specifically addressed this concern in the Camden Bay permit. This is important since the icebreaker activities represent a large portion of the overall emissions from the exploration activities. Specifically, the ice management vessels' activity accounts for more than three quarters of the total annual PM_{2.5} emissions (and over two thirds of the total annual NO_x emissions) from Shell's exploration drilling activities in the Beaufort Sea.¹⁹⁹ The ice management vessels' emissions are dependent on ice conditions; heavier ice conditions result in heavier engine load factors and higher emissions. The Proposed Statement of Basis (p. 54) indicates that, "[b]ased on statistics on ice at the Sivulliq drill site in the Beaufort Sea, Shell estimates that ice breaking capability in its lease holdings in Lease Area lease sales 195 (March 2005) and 202 (April 2007) in the Beaufort Sea would only be required 38 percent of the time."

Assuming this is the same data used for the Exploration Plan, this estimate is based on 2003-2005 data.²⁰⁰ The reference for this statement is a recent (2009) conversation between Air Sciences, Inc. and the "Arctic Wells Advisor" for Shell International

¹⁹⁹ Shell Outer Continental Shelf Pre-Construction Air Permit Application Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, January 2010, Table 2-2, p. 15.

²⁰⁰ Shell Beaufort Sea EP EIA Appendix H at 206

Exploration and Production, Inc. Based on these data and this reference, it was assumed that there would be a 38% frequency of ice within 30 miles of the drillship. However, in its revised application to the US Coast Guard for safety zone designation, Shell characterized the ice conditions more recently than 2003-2005 as follows:

Ice conditions during 2006 were such that the areas of drilling interest were ice covered the majority of the period between July and October. If ice conditions are similar during 2007, then each drill rig will be constantly ice managed within its anchor array.²⁰¹

This indicates that there is a strong possibility that the 38% frequency of ice may grossly underestimate emissions from the icebreaker vessels. EPA must secure an unbiased source of data for this important assumption – something other than an estimate from Shell of ice conditions. If the operator's estimate is based on a scientific analysis of ice flow data from 2003-2005 then that analysis should be made available and more recent data, if possible, should be incorporated into the analysis. The icebreaker vessels' emissions must be modeled to account for the maximum potential operation scenario under maximum ice conditions for the relevant time of year.

B. Oil spill response.

EPA does not address the potential air impacts from sources associated with potential oil spills in this permit. There are emissions estimates for oil spill response vessels in the inventory to account for emissions from these vessels associated with training and drills but EPA does not directly address the potential ambient air quality impacts from the pollutants that will occur in the event of an oil spill. The details of an oil spill response and ensuing emissions are known and therefore we ask that EPA consider these potential emissions along with Shell's potential to emit. EPA should complete a full evaluation of the potential air quality impacts from an oil spill scenario, including VOC and HAP emissions from evaporation, PM_{2.5} and PM₁₀ emissions from in-situ burning during cleanup operations and combustion emissions (NO_x and PM) from vessels during the response. Alternatively, EPA should clarify the applicability of USCG and ADEC guidelines and rules to Shell's operations (*e.g.*, related to spill scenarios for in-situ burning, etc.) and how these will ensure protection of human health in the event of an oil spill.

If EPA will not be addressing an emergency oil spill response event directly in this permit then it needs to address how attainment of the NAAQS will be assured for both the Inner OCS and Outer OCS baseline areas, in general. The CAA Section 110 requirements for States to prepare State Implementation Plans (SIPs) that detail provisions for attainment and maintenance of the NAAQS in the Air Quality Control Regions (AQCR) under its jurisdiction apply to the Inner OCS portion of the AQCR

²⁰¹ Letter from Susan Childs, Regulatory Affairs Coordinator – Alaska, Shell Offshore Inc. to United States Coast Guard, District 17 at 2 (May 30, 2007), regarding the establishment of safety zones for the Frontier Discoverer drill ship and the semi-submersible drill unit Kulluk in the Beaufort Sea, Alaska.

where Shell proposes to conduct its exploratory drilling program. EPA must clearly explain how it will be ensuring attainment of all NAAQS in the Outer OCS portion of the applicable AQCR in the absence of a SIP for this area. Specifically, EPA must address how the enforceable measures of a Federal Implementation Plan may be needed in order to establish contingency plans for air pollution emergencies, such as may occur during an oil spill.

C. Hazardous Air Pollutants (HAPS).

The proposed permit is based on total hazardous air pollutant emissions from the proposed exploration drilling program of 1.69 tons per year, as quantified in Shell's permit application materials. Shell's estimates are based on "requested limits and other limits assumed under the permit application and supporting materials submitted to EPA (Shell Beaufort Permit Application 01/18/10, Table 2-2)."²⁰²

The emissions calculations included in Shell's application materials show HAP estimates for units FD-1 through FD-23, the ice management fleet and the OSR fleet. There are no HAP emissions estimates for the fuel tanks (FD-24 through FD-30), the drilling mud system (FD-32) and the shallow gas diverter system (FD-33).²⁰³ We are concerned that this application does not include comprehensive estimates for individual HAPs as well as an assessment of total HAP emissions from all sources combined. We reviewed all the work materials EPA provided supporting the proposed permit, and there is no indication that EPA completed a technical review of the HAPS inventory. EPA's inventory in Appendix A of the Statement of Basis includes only criteria air pollutants (i.e., no HAP emissions estimates). EPA relies on Shell's application estimate of 1.69 tons of HAPS, and as explained above, this number is underestimated because it uses non-standard industry and MMS venting factors. We request that EPA complete a thorough technical review of the HAPs inventory to ensure it has been properly computed, and as noted above, if EPA is concerned about the use of MMS venting factors, we recommend source testing to verify VOC/HAP emissions from these operations during the first season of operation to improve emission estimates.

D. Background concentrations

1. Use of Maximum Monitored Concentrations as Representative of Background Concentrations

EPA and Shell are relying on data collected at several different monitoring stations across the North Slope as representative of background concentrations for the Shell exploratory drilling program in the Beaufort Sea. Table 5-10 of the Statement of Basis summarizes maximum measured concentrations of PM₁₀, NO₂, CO and SO₂ at eight different monitoring sites. The background concentrations used in EPA's ambient impact analysis,

²⁰² EPA Stmt of Basis at 30.

²⁰³ See Shell Outer Continental Shelf Pre-Construction Air Permit Application Frontier *Discoverer* Beaufort Sea Exploration Drilling Program, January 2010, Table 2-2, p. 15.

as reported in Table 5-11 Background Estimates for NAAQS Analysis, do not reflect the maximum concentrations monitored and reported in Table 5-10. For example, EPA chose to use a 24-hour average PM₁₀ background concentration of 55.1 µg/m³ from the BPXA Prudhoe Bay monitor even though two other monitors listed in Table 5-10 measured higher concentrations – one of which measured a concentration two times higher (114 µg/m³). EPA must explain why neither of these two higher concentrations were used as the representative background concentration for PM₁₀. Similarly, EPA used the annual NO₂ background concentration of 11.3 µg/m³ concentration measured at the BPXA Liberty monitor even though two other monitors measured higher concentrations of NO₂ - one by as much as 75%. EPA must explain why it did not use the 19.7 µg/m³ concentration measured at the BPXA Prudhoe Bay station as representative of annual NO₂ concentrations.

We urge EPA to use the *highest* monitored concentration for each pollutant and for each averaging time (i.e., pollutant concentrations need not be from the same monitor for both short-term and long-term averaging times). The NAAQS were set to protect the public and the environment from the adverse effects from air pollution. Thus, in determining whether these air quality standards might be exceeded as a result of Shell's proposed exploration drilling program, EPA must use background concentrations that are truly representative of the maximum concentrations that are currently occurring. Only by using a background concentration that is representative of the maximum concentration for the area will EPA be achieving the most protective outcome. Using a concentration that is lower than monitored levels in the area leaves open the possibility that EPA's analysis could under-estimate the impacts on human health that will result from Shell's emissions on top of all other air emissions sources in the region. Using a lower background concentration than what has been observed elsewhere, nearby, in the area simply ignores the real fact that higher levels of background pollutant concentrations can occur. As an example, use of the maximum pollutant concentrations in Table 5-10 would result in 24-hour PM₁₀ impacts at 90% of the NAAQS (instead of 50% of the NAAQS as presented in Table 5-14 of the Statement of Basis).

2. PM_{2.5} Background Concentrations

We are very concerned with the limited amount of data used as the basis for the background PM_{2.5} concentrations. The Badami station began collecting PM_{2.5} data on August 20, 2009.²⁰⁴ EPA is accepting data collected through December 15, 2009 from the Badami station in fulfillment of the preconstruction monitoring requirement of 40 CFR § 52.21(m). EPA justifies the use of these data as representative of background concentrations for Shell's exploratory drilling program in the proposed permit, as follows:

The available PM_{2.5} data from Badami covers a roughly four month period which is within Shell's 168-day drilling season between July 1 and December 31. We expect to receive PM_{2.5} data from Badami for the period December 15 through December 31, 2009, during the public comment

²⁰⁴ EPA Stmt of Basis at 111.

period for this permit, after which the data set is expected to meet the four-month requirement for acceptability under 40 C.F.R. 52.21(m)(1)(iv). PM_{2.5} data from July 1 to August 15, 2009, is not available at Badami, so the data will not cover the entire drilling season. It is expected that local contributions of PM₁₀ and PM_{2.5} from blowing dust would be highest in the summer months, while contributions from local fuel-burning heating units would be higher in the fall and winter months. No information is available on the seasonality of any particulate matter transported from overseas. EPA expects that actual background levels of pollution several miles offshore in the vicinity of Shell's planned exploratory drilling operations are likely to be lower than the levels recorded onshore, where monitors are affected by local industrial and residential sources.²⁰⁵

EPA's regulations require at least one year of pre-construction monitoring data unless "the Administrator determines that a complete and adequate analysis can be accomplished with monitoring data gathered over a period shorter than one year (but not to be less than four months)."²⁰⁶ It is questionable that even the bare-minimum requisite four months of PM_{2.5} data have been obtained. Clearly EPA has based this proposed permit on a data set that does not meet the minimum requirements for pre-construction monitoring in 40 CFR 52.21. EPA has not reviewed a complete and validated four month record of data from the Badami site (EPA only has valid data from August 20 - December 15, which is not a complete four month period). On top of that, there are a full 14 days, or *two full weeks*, of invalid data in the August 15 - December 15, 2009 dataset. This includes eight consecutive days of invalid data collection in October 2009, which is the same month during which the maximum concentration was recorded. This seriously calls into question the completeness of this record.

We strongly believe Shell should be required to collect a full year worth of pre-construction monitoring data prior to beginning exploration activities. The fact that EPA's proposed (and re-proposed) permits for Shell's exploratory drilling programs in the Beaufort and Chukchi Seas both include requirements for post-construction monitoring of PM_{2.5} (e.g., Condition S.1 of the proposed Beaufort Sea permit) undercuts the Agency's argument that sufficient pre-construction monitoring data exist. This same issue was raised to Shell as far back as 2007²⁰⁷ when we requested additional site-specific monitoring data to be collected for their proposed exploratory drilling program; Shell has had adequate time to collect the data. There should be no short cuts for failing to collect an adequate amount of pre-construction monitoring data and Shell should be held to the same regulatory standards as all other applicants. Nevertheless, if EPA will be accepting less than twelve months worth of pre-construction monitoring data for PM_{2.5}, we urge EPA to consider the fact that the background concentrations are based on a much more

²⁰⁵ EPA Stmt of Basis at 111.

²⁰⁶ 40 CFR § 52.21(m)(1)(iv).

²⁰⁷ Letter from Johnny Aiken, North Slope Borough, to Natasha Greaves and Dan Meyer, EPA Region 10 (May 11, 2007) (Attachment 21).

limited data set than optimal and, therefore, must pursue conservative assumptions in defining background concentrations.

Recall, for example, what has happened with the data set used for Shell's Chukchi Sea permit. With each subsequent data report from the Wainwright monitor, higher monitored concentrations of PM_{2.5} were recorded. The original proposed permit for the Chukchi Sea used a background concentration of 8 µg/m³. Shell then submitted monitoring data collected at the Wainwright monitoring station through July 31, 2009 to EPA (on September 17, 2009) which included higher recorded values than the previous record. Specifically, 24-hour average PM_{2.5} concentrations collected in July included no less than eight days where the maximum recorded 24-hour average concentration was equal to or greater than the background concentration of 8 µg/m³ used in EPA's and Shell's ambient air impact analysis. The highest 24-hour average concentration from July of 14 µg/m³ was 75% higher than the background concentration used in the original proposed permit analysis. Use of any of the top three supplemental monitored concentrations as representative background concentrations in EPA's ambient air analysis would have resulted in modeled violations of the 24-hour PM_{2.5} NAAQS.²⁰⁸ Shell subsequently revised its operating scenarios and submitted new modeling to EPA demonstrating compliance with the NAAQS based on a background concentration of 14 µg/m³. However, the 4th quarter monitoring report from Wainwright again showed higher 24-hour PM_{2.5} concentrations – as high as 23 µg/m³. In the end, EPA's re-proposed permit included a background concentration of 11 µg/m³ based on several factors, including an adaptation of the monitored data set to subtract out days with high winds, no precipitation and non-stabilized surfaces (i.e., no snow cover) in order to better represent "offshore" concentrations. After a close look at the data set, we supported adapting the data set to account for the fact that windblown dust is not a factor in offshore concentrations. We strongly urged EPA, however, not to go any lower than its proposed background concentration of 11 µg/m³ for offshore background concentrations of PM_{2.5}. We told EPA, specifically, that because at least one 24-hour average concentration of 11 µg/m³ occurred on a day with no high-winds (see, e.g., Wainwright data collected on July 14, 2009) it was imperative that EPA use, at least, this maximum monitored value as representative of background concentrations offshore. We again reminded EPA that this is particularly important since we do not support the use of a pre-construction monitoring period less than a year.

EPA's proposed permit for Shell's exploration drilling in the Beaufort Sea uses a 24-hour average PM_{2.5} background concentration of 10 µg/m³. First of all, EPA must explain why this concentration is protective given the fact that it is using a higher concentration as

²⁰⁸ EPA Re-Proposed Stmt of Basis, Appendix B, Table 12a shows a max modeled 24-hour average concentration for PM_{2.5} of 25.7 µg/m³ (SOS #1). Considering the top three monitored concentrations at Wainwright, total predicted concentrations are as follows:

$$25.7 \mu\text{g}/\text{m}^3 + 14 \mu\text{g}/\text{m}^3 = 39.7 \mu\text{g}/\text{m}^3 \text{ (113\% of 24-hour PM}_{2.5}\text{ NAAQS)}$$

$$25.7 \mu\text{g}/\text{m}^3 + 13 \mu\text{g}/\text{m}^3 = 38.7 \mu\text{g}/\text{m}^3 \text{ (111\% of 24-hour PM}_{2.5}\text{ NAAQS)}$$

$$25.7 \mu\text{g}/\text{m}^3 + 11 \mu\text{g}/\text{m}^3 = 36.7 \mu\text{g}/\text{m}^3 \text{ (105\% of 24-hour PM}_{2.5}\text{ NAAQS)}$$

representative of offshore background PM_{2.5} concentrations for the Chukchi Sea permit. This does not appear to be the most prudent course considering the limited (and incomplete) data set available to date for the Beaufort Sea. EPA's compliance demonstration is already so incredibly tight that a change in the background concentration from 10 µg/m³ to 11 µg/m³ would mean that Shell would not be able to demonstrate compliance with the 24-hour PM_{2.5} NAAQS considering a margin of error based on the accuracies of the input data. Specifically, we commented earlier that if, as indicated, the uncertainty in the stack test data is upwards of 15%, then Shell must be able to demonstrate compliance with the NAAQS considering a margin of error no less than 15%. This would mean the predicted 24-hour PM_{2.5} concentration would need to be less than 29.8 µg/m³ when considering the applicable background concentration. Using a background concentration of 11 µg/m³ results in a 24-hour PM_{2.5} concentration of 30.2 µg/m³, which means that – given the uncertainty in the input data – Shell cannot reasonably demonstrate compliance with the 24-hour PM_{2.5} NAAQS.

Given the limited and incomplete PM_{2.5} data set that is the basis for EPA's compliance demonstration for the proposed permit, EPA must use the most conservative background concentration possible which, at a minimum, would be equal to the value used as representative of offshore sources for the Chukchi Sea permit. There is no reason why that value of 11 µg/m³ would not be applicable in the Beaufort Sea as well. EPA must then revise emission limits, as needed, in order to demonstrate compliance with the 24-hour PM_{2.5} NAAQS based on an appropriate margin of error that is based on the uncertainties in the emissions data.

Due to the limited data record for PM_{2.5}, we also strongly support the use of actual maximum monitored PM_{2.5} concentrations at representative onshore locations as representative of background concentrations when determining compliance with NAAQS onshore. For example, there appear to be localized PM_{2.5} monitoring data recently collected in the community of Nuiqsut.²⁰⁹ These data should be used as appropriate background concentrations when determining PM_{2.5} impacts at this location.

3. Collocated Sampling Requirements

When EPA proposed the original Chukchi Sea permit Shell did not operate a collocated PM_{2.5} sampler. We commented that:

For PSD monitoring, EPA should require collocation at least at one site in the network²¹⁰ operating one-in-six days for a sampler operating on a one-in-three day schedule, or one-in-three days for a sampler running every day.²¹¹ EPA must also require quarterly Performance Evaluation Program (PEP) audits of 100

²⁰⁹ See “20090826_BS_Hall_email_Re_Fw_North_Slope_Part particulate.pdf” included as part of the Administrative Record showing PM_{2.5} concentrations collected in Nuiqsut July 21 – August 23, 2009.

²¹⁰ 40 C.F.R. § 58 Appendix A §3.2.5.5.

²¹¹ *Id.* § 58 Appendix A §3.2.5.7.

percent of the network every quarter.²¹² Since PSD monitoring sites operate for such a short relative period, it is extremely important to have tight Quality Assurance controls. These requirements should be spelled out in the Quality Assurance Project Plan (QAPP) written by the monitoring organization and approved by the overseeing entity (in this case, the Region). EPA must clearly identify the expectations for how the data being gathered will be used, and what is allowable for the precision and bias values in order to be able to apply the data with a reasonable level of confidence.

Given the fact that both the Wainwright and Badami PSD monitoring sites have been collecting data for less than a year, it is extremely important to have a good measure of the precision and bias of the monitoring network to ensure that the monitoring that is done has tight Quality Assurance controls. There is no reference to a collocated sampler or to the requirement for Shell to operate a collocated sampler in the Beaufort Sea permit or statement of basis. Supplemental materials included in the administrative record discuss the installation of a collocated sampler at Deadhorse but the details of the Quality Assurance Project Plan (QAPP), as they pertain to our original comments for the Chukchi Sea permit on the need for a collocated sampler, quarterly PEP audits, tight precision and bias goals, etc, are not addressed. A review of the QAPP for the Deadhorse monitoring location indicates that, in fact, there will be a collocated PM_{2.5} sampler to evaluate precision and bias in CPAI-Shell's PM_{2.5} network.

According to the PSD requirement for collocated monitors, 40 CFR Appendix A Section 3.2.5.5 states that, for collocated monitors, "[a] site with the predicted highest 24-hour pollutant concentration must be selected." EPA should discuss how this requirement is met, either through monitoring or modeling. The QAPP (p. 13 of 64) only mentions that "[a] station located in Deadhorse likely will have the highest concentrations in the network" but there is no concrete information in support of this claim. This requirement will help ensure the use of a collocated sampler that is best able to measure precision and bias for the network. Further, according to the project schedule, the first quarterly report for the collocated monitor is not due until 30 days after the end of the quarter. Since the collocated sampler was not operational until October 22, 2009 it appears that the report will not be available until mid-February. We would like assurance from EPA that the precision and bias goals established in the QAPP are being met.

E. Ambient Air Boundary.

Shell has applied for a safety exclusion zone for the Discoverer drill ship and the U.S. Coast Guard (USCG) has proposed approval of such a zone.²¹³ According to the USCG proposal:

“[t]he purpose of the temporary safety zone is to protect the DRILLSHIP from

²¹² *Id.* § 58 Appendix A §3.2.7.

²¹³ Safety Zone; FRONTIER DISCOVERER, Outer Continental Shelf Drillship, Chukchi and Beaufort Sea, Alaska, 75 Fed. Reg. 803-807 (Jan. 6, 2010).

vessels operating outside normal shipping channels and fairways. Placing a temporary safety zone around the DRILLSHIP will significantly reduce the threat of allisions, oil spills, and releases of natural gas, and thereby protect the safety of life, property, and the environment.”²¹⁴

We would like to emphasize that nowhere in the proposal for the temporary exclusion zone does it state an intent to change the location of the ambient air boundary for the purposes of demonstrating compliance with Clean Air Act requirements, including compliance with NAAQS and PSD increments. In fact, it has been our longstanding position that regardless of the need for an exclusionary safety zone (to minimize the potential threats to life, property and the environment from allisions, oil spills, etc.) Shell must continue to demonstrate compliance with all CAA requirements at the location of maximum concentration regardless of the safety zone boundary, EPA cannot ignore predicted concentrations just because they occur within a USCG designated safety zone.

F. PSD Increment Applicability.

We strongly support EPA’s position on the need for demonstrating compliance with PSD increments on the OCS. Specifically, we agree with EPA’s position, articulated in the statement of basis for the proposed permit (at p. 21) that OCS permitting rules applicable to sources further than 25 miles beyond a state’s seaward boundary apply in the same manner as the PSD requirements of 40 CFR 52.21 apply to onshore sources. Clearly this includes compliance with the PSD increments for Shell’s exploration activities in the Beaufort Sea. Further, we agree that the required air analysis is *not* limited to the impacts of offshore sources to onshore areas. Finally, we agree with EPA’s interpretation that the minor source baseline dates of the corresponding onshore area (i.e., February 8, 1988 for NO₂, November 13, 1978 for PM and June 1, 1979 for SO₂) apply in the “Inner OCS” and, therefore, all increment-affecting sources must be considered when modeling increment consumption at receptor locations in the “Inner OCS”. Shell’s opposition to EPA’s interpretation of the minor source baseline dates is unwarranted. As EPA explained in its July 2, 2009 internal memorandum, the COA minor source baseline dates are applicable²¹⁵ because the COA requirements apply to sources located within 25 miles from the State’s seaward boundary.²¹⁶ These are important distinctions and we would like to clearly support EPA’s position as it moves forward with this and future OCS permitting actions.

G. Regional Inventory

We request that EPA verify that the regional source inventory used for the proposed permit includes: (1) all major and minor sources for which applications have been

²¹⁴ 75 Fed. Reg. at 803

²¹⁵ EPA, Internal Memorandum from David C. Bray to Rick Albright and Janis Hastings, RE: Implementing PSD Baseline Dates, Baseline Areas, and Baseline Concentrations on the Outer Continental Shelf in Alaska at 2 (July 2, 2009).

²¹⁶ 40 C.F.R. § 55.3(b)

deemed complete even if a permit has not been issued by the State of Alaska; and (2) all fugitive and area sources in the region.

H. Secondary PM_{2.5} formation.

An important consideration in determining PM_{2.5} impacts, which is not accounted for in the modeling for the proposed permit, is the assessment of secondary PM_{2.5} formation in the atmosphere. In addition to primary PM_{2.5} emissions (directly emitted from combustion point sources and from fugitive sources), emissions of NO_x, VOCs, SO₂ and ammonia can form, after being emitted into the atmosphere, into PM_{2.5} and this can potentially be a significant component of ambient PM_{2.5} concentrations.²¹⁷ And while primary PM_{2.5} emissions are generally a localized issue, secondary PM_{2.5} emissions can be more regional in scale. Secondary PM_{2.5} formation could be especially important considering the fact that the modeling results presented in the Statement of Basis predict PM_{2.5} concentrations at 83% of the 24-hour NAAQS and are not within the appropriate margin of error when considering the issues with the background concentrations and the accuracy of the data inputs for the analysis.²¹⁸ This concern is compounded by the new PM_{2.5} increments, which further raise concerns that Shell may not be able to comply with applicable legal requirements.

The fraction of PM_{2.5} concentrations in the ambient air that is due to the secondary formation of PM_{2.5} (e.g., sulfates and nitrates), as opposed to directly emitted [primary] PM_{2.5} (e.g., as a product of combustion) is dependent on many factors. However, the presence of strong temperature inversions that limit dispersion contribute to the formation of secondary PM_{2.5} in the atmosphere and can increase secondary PM_{2.5} formation. PM_{2.5} concentrations, therefore, can be due to gaseous pollutants that form fine particles after reacting with other compounds in the air during meteorological inversions and it is important for EPA to consider these PM_{2.5} precursor sources (e.g., NO_x from the diesel combustion sources associated with Shell's exploration drilling program) in its OCS permitting. Because of the presence of strong temperature inversions on the North Slope, EPA should seriously consider the contribution from secondary PM_{2.5} to total PM_{2.5} concentrations from the permitted sources on the OCS.

EPA must address how it will account for secondary PM_{2.5} impacts from permitted sources such as Shell's exploration activities. If it will not be directly addressing this issue in Shell's final permit then EPA, at the very least, should give an indication of how it is working to be able to address this important component of PM_{2.5} in future permitting actions. EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) provides various resources for modeling the impacts of secondary PM_{2.5}. For example, EPA's recently-developed model based on the Community Multi-scale Air Quality (CMAQ) model in support of the development of the PM_{2.5} NAAQS has been shown to

²¹⁷ See Damberg, Policies for Addressing PM 2.5 Precursors (available at: http://www.epa.gov/ttnnaqs/pm/presents/policies_for_pm25_precursors-rich_damberg.ppt) (Attachment 22).

²¹⁸ EPA Stmt of Basis at Table 5-14.

“reproduce the results from an individual modeling simulation with little bias or error” and “provides a wide breadth of model outputs, which can be used to develop emissions control scenarios”.²¹⁹ The Comprehensive Air quality Model with extensions (CAMx) is another tool available to assess secondary PM_{2.5} formation. CAMx has source apportionment capabilities and can assess a wide variety of inert and chemically reactive pollutants, including inorganic and organic PM_{2.5} and PM₁₀. The Regional Modeling System for Aerosols and Deposition (REMSAD) can also model concentrations of both inert and chemically reactive pollutants on a regional scale, “including those processes relevant to regional haze and particulate matter”.²²⁰ These are just some examples of current models, identified by EPA, with the capability to assess secondary PM_{2.5} impacts. With adequate testing (using existing regional monitoring data to ensure accuracy) these models could be used in the permitting context for larger sources. An alternative to these grid models would be for EPA to develop a screening point source model - like CALPUFF - to look at near-field PM_{2.5} primary and secondary impacts.

There have been several oil and gas Environmental Impact Statements that have already used (or are using) CMAQ or CAMx to estimate PM_{2.5} concentrations. The Uinta Basin Air Quality Study in Utah and the Four Corners Air Quality Group Modeling Project in Colorado are examples of completed modeling studies of this type.²²¹ And both the Continental Divide and Hiawatha EISs in Wyoming are examples of projects using grid modeling to assess PM_{2.5} concentrations.²²²

We strongly encourage EPA to address – in the statement of basis for the final permit issued to Shell – how it will account for secondary PM_{2.5} formation from permitted sources in the region. The secondary PM_{2.5} component could be critical to understanding the best way to mitigate potential PM_{2.5} impacts.

I. Impacts to regional Ozone.

While we agree that emissions from one permit may not trigger the need for a comprehensive quantitative regional assessment of ozone, the fact that there are at least three OCS exploration projects being permitted in the region in the near future (e.g., Shell’s Chukchi and Beaufort Sea programs as well as ConocoPhillips’ proposed exploration in the Chukchi Sea which EPA has already received an application for) we strongly urge EPA to commit to a more comprehensive look at the cumulative impacts of these and other reasonably foreseeable sources on concentrations in the region. It is not

²¹⁹ See Technical Support Document for the Proposed PM NAAQS Rule (available at: http://www.epa.gov/scram001/reports/pmnaaqs_tsd_rsm_all_021606.pdf) (Attachment 23).

²²⁰ See <http://remsad.saintl.com/> (Attachment 24).

²²¹ See Uinta Basin Air Quality Study (UBAQS) News Release at <http://ipams.org/wp-content/uploads/2009/05/News-Release-UBAQS.pdf> (Attachment 25); Four Corners Air Quality Task Force modeling info at <http://www.nmenv.state.nm.us/aqb/4C/Modeling.html> (Attachment 26).

²²² See, Continental Divide EIS documents at http://www.blm.gov/wy/st/en/info/NEPA/rfodocs/cd_creston.html and Hiawatha EIS documents at <http://www.blm.gov/wy/st/en/info/NEPA/rsfodocs/hiawatha.html>.

ok to wait until monitoring shows a problem. Regardless of the source of background concentrations in the area (i.e., whether from transcontinental transport or from local sources) EPA must be able to ensure the public that no source will contribute to ozone exceedances. As EPA continues to permit additional sources of NO_x and VOC in the region, it must be able to determine the cumulative impacts of these sources on future ozone concentrations.

Background concentrations of ozone, as EPA points out, are already as high as 50 ppb (8-hour average) on the North Slope. This background level is already two-thirds of the way to the 8-hour average standard of 75 ppb and over 80% of the way towards the lower range of EPA's proposed revisions to the ozone standard.²²³ EPA is proposing to strengthen the 8-hour average ozone standard, designed to protect public health, to a level within the range of 60-70 ppb. EPA's proposal is based on scientific information, including epidemiological and human clinical studies, showing effects in healthy adults at levels as low as 60 ppb.²²⁴

EPA's proposed permit indicates that it "*believes* that emissions from Shell's exploration operations will not cause or contribute to a violation of the NAAQS for ozone." [Emphasis added] Statement of Basis at 126. However, EPA has yet to complete any analysis of the proposed impacts from exploratory drilling programs on the OCS on ozone concentrations in the region. EPA should more thoroughly address the potential regional ozone impacts from the permitting actions of large air pollution sources on the OCS as it continues to receive applications for exploration activities. This is especially important considering EPA's proposed strengthening of the standard to better protect human health.

Traditionally, elevated ozone levels are thought to be a summertime problem that plagues large urban areas. However, "recent events that have occurred in rural southwest Wyoming in wintertime demonstrate this is not always the case."²²⁵ This raises a potential concern with respect to potential regional ozone formation on the North Slope of Alaska during the non-summer months. According to a recent study by the National Oceanic and Atmospheric Administration, ozone rapidly formed in southwest Wyoming "when three factors converged: ozone-forming chemicals from the natural gas field, a strong temperature inversion that trapped the chemicals close to the ground, and extensive snow cover, which provided enough reflected sunlight to jump-start the needed chemical reactions."²²⁶ The North Slope of Alaska also exhibits these three factors

²²³ 75 Fed. Reg. 2938, January 6, 2010

²²⁴ EPA's Proposed Revisions to National Standards for Ground-Level Ozone, January 6, 2010, Fact Sheet, available online at <http://www.epa.gov/air/ozonepollution/pdfs/fs20100106std.pdf>. (Attachment 27)

²²⁵ WYDEQ [Sublette County Air Quality Information Page](http://deq.state.wy.us/out/downloads/PINEDALE%20April%2008%20Town%20Meeting.pdf), *see e.g.*, <http://deq.state.wy.us/out/downloads/PINEDALE%20April%2008%20Town%20Meeting.pdf> (Attachment 28); *see also* <http://www.starvalleyindependent.com/2009/03/governor-concerned-over-southwest-wyoming-ozone-levels/>. (Attachment 29).

²²⁶ *See* NOAA's press release (available at: http://www.noaanews.noaa.gov/stories2009/20090118_ozone.html) (Attachment 30); January 18, 2009 for

needed for ozone formation. First, industrial sources in the North Slope region have the potential to contribute tens of thousands of tons of NO_x emissions (80,000 TPY) and several thousand tons of VOC emissions (2,500 TPY) to the area each year.²²⁷ These sources and Shell's proposed OCS activities are all contained within an area similar in size to a representative regional ozone study domain (e.g., 400-500 km by 400-500 km). In comparison, the NO_x inventory for the counties that include the Wyoming development field totals just over 60,000 TPY and VOC emissions total just over 10,000 TPY.²²⁸

Second, strong temperature inversions frequently occur in Alaska's North Slope region. Finally, extensive snow cover is persistent in the region from as early as September through June.²²⁹ The Chukchi and Beaufort Seas exploration activities will occur, at least in part, during this period. While there may not be available sunlight in the dead of winter there is certainly abundant sunlight in the fall and spring in conjunction with snow cover and strong temperature inversions. The fact that the pollution sources and photochemical mechanisms for producing ozone are available and the possibility of elevated background concentrations from global transport of pollution is real means that EPA must more thoroughly investigate the effects of NO_x and VOC sources from the proposed exploration activities on the OCS and from existing and reasonably foreseeable NO_x and VOC sources in the region on ozone formation on the North Slope.

Even though monitored levels of ozone in the region do not threaten compliance with the NAAQS, background concentrations as high as 50 ppb (based on daily average data from NOAA/GMD monitoring in Barrow²³⁰) have been observed. This level is equivalent to background concentrations currently observed in the active oil and gas development areas in the Uinta Basin in northeast Utah.²³¹ EPA has a regulatory obligation to ensure

Schnell, R.C., et al. 2009. Rapid photochemical production of ozone at high concentrations in a rural site during winter. *Nature Geoscience* 1-3 (January 18, 2009) (available at: <http://www.nature.com/naturegeoscience>).

²²⁷ See The North Slope Borough Region Emission Summary in Table 3.4.5-8 of the Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement, OCS EIS/EA MMS 2008-0055. Total permitted NO_x emissions exceed 83,000 TPY and total permitted VOC emissions exceed 2,500 TPY (available at: http://www.mms.gov/alaska/ref/EIS%20EA/ArcticMultiSale_209/2008_0055_deis/vol4k5.pdf) (Attachment 31).

²²⁸ Based on 2005 emissions data presented in meeting notes from Greater Yellowstone Area Clean Air Partnership Annual Meeting, Pocatello, ID, October 17-18, 2007 (available online at http://www.fs.fed.us/r1/gallatin/resources/air/gyacap/docs/GYACAP-Pocatello_2007_Meeting_Notes.doc) (Attachment 32).

²²⁹ See, e.g., the Barrow Snowmelt Date study performed by NOAA's Earth System Research Lab (available at <http://www.esrl.noaa.gov/gmd/grad/snomelt.html>) (Attachment 33).

²³⁰ See World Data Center for Greenhouse Gases (available at: <http://gaw.kishou.go.jp/cgi-bin/wdceg/accessdata.cgi?index=BRW471N00-NOAA&select=inventory>) (Attachment 34).

²³¹ Background ozone concentrations in the Uinta Basin, Utah from recent (2008) EAs = 50 ppb (draft Big Pack EA UT-080-06-488, draft River Bend EA UT-080-07-772, draft Southam Canyon EA UT-080-08-342) (available at: <http://www.blm.gov/ut/st/en/fo/vernal/planning/nepa.html>).

compliance with the NAAQS. Emissions will dilute as they transport away from their source of origin, but spreading of plumes is not always rapid and is highly dependent on the atmospheric stability at the time. Emissions from Shell's activities could certainly contribute to ozone formation in the region under the right conditions, as described above.

A study looking at future ozone concentrations in the Arctic from increased shipping traffic in the Arctic northern passages determined that ships' combustion engines could increase ozone concentrations in the region by 2-3 times in the decades ahead (with predicted peak concentrations reaching more than 60 ppb_v in July and August).²³² According to the same study, "the photochemical lifetime of ozone [in the Arctic] is rather long, and its deposition velocity on ice and water is small." Furthermore, "[i]n most regions of the troposphere, including the remote Arctic areas where background concentrations of pollutants are particularly low, the formation rate of ozone is limited by the amount of nitrogen oxides that are present in the atmosphere." Thus, it is conceivable that NO_x (and VOC) emissions from Shell exploration activities in the Chukchi and Beaufort Seas could contribute to elevated ozone concentrations in the region, even during the summer months.

We would like to see EPA require a more thorough evaluation of potential ozone impacts in the region from ongoing permitting activity on the OCS. Seeing as how monitored levels of ozone are already over 80% of the level at which EPA has concluded results in health impacts to adults, we are concerned that continued permitting of sources in the region without further analysis may result in adverse health impacts to the region.

IX. Compliance with other Environmental Laws And Requirements is A Necessary Step Toward Protecting the Arctic and the Communities Who Depend Upon It.

Prior to the issuance of any permit to Shell, there are several environmental laws that must be complied with.

A. Compliance With The National Environmental Policy Act is Imperative To Authorizing Hydrocarbon Exploration.

The National Environmental Policy Act (NEPA) is our Nation's "basic national charter for protection of the environment."²³³ NEPA declares a national policy "to enrich the understanding of the ecological systems and natural resources important to the

²³² Granier, C., U. Niemeier, J. H. Jungclaus, L. Emmons, P. Hess, J.-F. Lamarque, S. Walters, and G. P. Brasseur (2006), Ozone pollution from future ship traffic in the Arctic northern passages, *Geophys. Res. Lett.*, 33, L13807, doi:10.1029/2006GL026180 (available at: <http://www.agu.org/pubs/crossref/2006/2006GL026180.shtml>) (Attachment 35).

²³³ 40 C.F.R. § 1500.1(a).

Nation,”²³⁴ and makes it the “continuing responsibility” of all federal agencies to “preserve important historic, cultural, and natural aspects of our national heritage”²³⁵

Shell’s PSD permit application is related to the company’s exploration plans in the Chukchi Sea. Shell is currently proposing exploratory operations in both the Chukchi and Beaufort Seas with related environmental impacts. We asked the Minerals Management Service (MMS) to analyze the impacts from these two Exploration Plans together under the National Environmental Policy Act (NEPA). Unfortunately, this request was not honored. Shell’s air emissions received minimal consideration under NEPA because MMS deferred to the EPA’s air permitting process.²³⁶ In addition, MMS failed to analyze the impacts from the generation of secondary air pollutants.²³⁷

Acknowledging the hefty workload Region 10 already has, we ask that whenever possible EPA provide assistance to MMS in analyzing and reviewing the impacts to air and water resources from proposed off-shore drilling operations in the Arctic.²³⁸ It is critical that all the impacts of oil and gas exploration are analyzed under NEPA.

B. EPA has not Complied with the Letter and the Spirit of Section 7 of the Endangered Species Act here.

We appreciate EPA consulting informally with the FWS and NOAA under the Endangered Species Act. In light of the importance of Camden Bay as feeding and resting ground for bowhead whales and the whale’s strong olfactory senses, which will be affected by both Shell’s air and water emissions, we ask that EPA reinstate section 7 consultations to ensure bowhead whales will not be adversely affected by Shell’s proposed operations. Additionally, unless EPA re-defines the scope of the final Permit to just encompass those well-sites for which Shell sought authorization for under OCSLA for its 2010 exploration program, then formal consultations are necessary to address the

²³⁴ 42 U.S.C. § 4321.

²³⁵ *Id.* § 4331(b)(4).

²³⁶ MMS, Environmental Assessment for Shell Offshore Inc. 2010 Outer Continental Shelf Lease Exploration Plan Camden Bay, Alaska at 18, 27-29, 63-65 (Oct. 2009) (available at: http://www.mms.gov/alaska/ref/EIS%20EA/mms2009_052_ea/2009_1015_EA.pdf). Indeed, MMS explains that “By demonstrating compliance with the applicable NAAQS, AAAQS, and PSD increment standards at the edge of the *Discoverer*, in the immediate vicinity of its support vessels, and at the Beaufort Sea shoreline, the air quality impact analysis prepared for Shell’s EPA permit application shows that Shell would not have a significant adverse impact at the nearest villages along the Beaufort Sea coast, Nuiqsut and Kaktovik. Please refer to EA Section 3.4 on air quality for additional discussion.” *Id.* at 63.

²³⁷ *Id.*

²³⁸ 40 C.F.R. § 52.21(s) (“[w]henever any proposed source or modification is subject to action by a Federal Agency which might necessitate preparation of an environmental impact statement pursuant to the National Environmental Policy Act, review by the Administrator conducted pursuant to this section shall be coordinated with the broad environmental reviews under that Act and under section 309 of the Clean Air Act”).

on-going impacts from Shell's many years of operations in both the Beaufort and Chukchi Seas and their ramifications for marine life.

Additionally, while we agree that MMS is the lead the agency for Section 7 consultations, as we are sure EPA is aware, MMS decided not to initiate the Section 7 consultation process to review Shell's Exploration Plans. We are concerned that the isolated consultations on just the air emissions on these operations is insufficient to ensure against the jeopardy of listed species that may be affected by entirety of Shell's proposed operations. For this reason, we encourage EPA to work with MMS, FWS, and NOAA in ensuring full compliance with Section 7 of the Endangered Species Act.

C. EPA Must Conduct an Environmental Justice Analysis before Making a Decision on Shell's Permit Application.

Under Executive Order No. 12898, EPA must consider and address, when appropriate, "disproportionately high and adverse human health and environmental effects of [their] programs, policies, and activities on minority and low-income populations."²³⁹ When issuing PSD permits, the EAB has required that the permitting agencies provide details about the required environmental justice analysis.²⁴⁰

In the statement of basis for the draft permit, EPA recognizes that the Alaskan Natives, a minority population, make up a significantly large portion of the potentially impacted communities.²⁴¹ As previously discussed in section III, Shell's operations will contribute to global warming effects that will harm the Arctic and threaten the livelihood of those native communities.

We appreciate EPA's efforts at meeting with affected North Slope communities and listening to their concerns regarding the proposed air and water permits in the Chukchi Sea. However, EPA's continued reliance upon Shell's compliance with the NAAQS to determine that Shell's air emissions will not harm human health and welfare is insufficient here.

Even though the NAAQS are supposed to protect human health with an adequate margin of safety, CAA § 109(b),²⁴² the standards often do not. EPA has failed to update the NAAQS every five years as required, thus the NAAQS do not always reflect the current state of technological and scientific knowledge about criteria pollutants. Even when EPA revises the NAAQS, the agency does not always adopt the most protective standard recommended by the Clean Air Scientific Advisory Committee to protect human health

²³⁹ See Exec. Order No. 12,898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7,629, 7,632-33 (Feb. 11, 1994).

²⁴⁰ See *In re: Knaf Fiber Glass*, PSD Permit No. 97-PO-06, 8 E.A.D. 121, 175 (1999) (remanding PSD permit to the permitting agency to include the environmental justice analysis in the record).

²⁴¹ EPA Chukchi Re-Proposed Stmt of Basis at 113.

²⁴² 42 U.S.C. § 7409(b).

and welfare. In fact, the U.S. House Committee on Oversight and Government Reform documented how political considerations trumped health recommendations in the March 2008 determination of the NAAQS for Ozone.²⁴³

Particulate matter provides a compelling example that the NAAQS are insufficient to protect public health. In the most recent revision of the NAAQS for PM, EPA documented the health problems associated with exposure to particulate matter, including chronic respiratory disease, asthma, lung cancer, and cardio-respiratory mortality.²⁴⁴ EPA found that epidemiological studies revealed a linear relationship between health problems, notably cancer, and the ambient concentration of particulate matter. EPA could not determine a threshold for particulate matter concentrations under which no human health effects would occur.²⁴⁵ This evidence suggests that any level of particulate pollution will have human effects, thus the PM NAAQS is not protective of human health. Due to the unreliability of the NAAQS, EPA cannot conclude that Shell's purported compliance with the NAAQS will protect the health and welfare of the native communities in the surrounding area.

Additionally, EPA has found that there are human health hazards associated with exposure to diesel exhaust. In the *Health Assessment Document for Diesel Engine Exhaust*, EPA explained that some of these health hazards include "acute exposure-related symptoms, chronic exposure related noncancer respiratory effects, and lung cancer."²⁴⁶ Notably, EPA found that diesel engine exhaust is "likely to be carcinogenic to humans by inhalation" through environmental exposures.²⁴⁷ EPA must consider whether or how these human health hazards will affect the native communities that are on-shore from Shell's operations. Thus, EPA must conduct an independent analysis to determine the impact of Shell's activities on the health and welfare of the native communities in the Chukchi Sea.

X. The Need for Meaningful Public Involvement and Accuracy in Rendering Decisions on Shell's OCS Permits.

Throughout the permitting process, Shell has asked EPA to issue the OCS PSD permits as quickly as possible. The record abounds with examples of a rushed approach by the Shell toward the need for time to properly evaluate and issue the first set of major source OCS PSD permits. For example, in September 2009, Shell sent a letter to EPA to

²⁴³ See Memo Re: Supplemental Information on the Ozone NAAQS, May 2008 (available at oversight.house.gov/documents/20080520094002.pdf) (Attachment 36).

²⁴⁴ See EPA National Ambient Air Quality Standards for Particulate Matter; Final Rule. 71 Fed. Reg. 61144, 61154 (Oct. 17, 2006).

²⁴⁵ See EPA National Ambient Air Quality Standards for Particulate Matter; Proposed Rule, 71 Fed. Reg. 2620, 2635.

²⁴⁶ Health Assessment Document for Diesel Exhaust (available at <http://cfpub.epa.gov/nea/cfm/recordisplay.cfm?deid=29060> at 1-3(May 2002)) (Attachment 37).

²⁴⁷ *Id.* at 1-4 and 1-5.

"reaffirm Shell's need to have both permits issued in final form by R10 by at least the end of 2009."²⁴⁸

This approach is unwarranted because the delay in the permitting process is a result of applicant's own actions. EPA informed Shell "[a]s early as April, 2008" that it needed to "start a preconstruction ambient air quality monitoring program for all criteria air pollutants consistent with the PSD regulation and guidance if they intended to propose projects in the Beaufort Sea OCS in the near future."²⁴⁹ Shell neglected to collect this data waiting instead for another company to set-up a monitoring station that generated data Shell is now utilizing in its permit applications.

In response to an earlier letter from Shell asking EPA to expedite the permitting process, EPA explained to Shell Alaska's General Manager:

I must reiterate that the delay in receiving updated emissions information in turn delayed our ability to work on drafting the permit and support documents. . . Shell has still been slow to provide other information, such as the Wainwright monitoring data and the requests for Letters of Authorization (LOA's) . . . [t]he lateness of some of this information is making it extremely difficult for us to meet our target of putting a draft permit out for public notice by mid-August.²⁵⁰

Most recently, Shell has requested that EPA finalize the Chukchi permit "within 10 days of the close of the comment period" and expedite the Beaufort permitting process.²⁵¹ Logistically, it would be next to impossible for EPA to meet its obligations to even respond to all comments in a meaningful way within a 10-day period. EPA has also received correspondence, through a July 30, 2009 letter to EPA from Alaskan Congressmen, advocating for EPA to complete permits for "certain offshore oil and gas exploration . . . in the Chukchi Sea and Beaufort Sea" within 2009 and stating that oil exploration "must . . . proceed without bureaucratic impediments."²⁵²

We applaud EPA for taking the requisite time to analyze Shell's application materials, to require Shell to complete deficiencies in its application, and to re-issue a draft permit for the Chukchi operations. Despite Shell's request for EPA to issue these permits by a certain date, EPA must ensure that these permits meet the CAA's legal requirements. Finalizing inadequate or legally deficient permits would circumvent the CAA's goals.

²⁴⁸ Letter from Peter Slaiby, Vice President Shell Alaska to Michelle L. Pirzadeh, Acting Regional Administrator, EPA Region 10 (September 1, 2009) (Attachment 38).

²⁴⁹ Letter from Richard Albright, EPA to Susan Childs, Shell at 11 (Sept. 4, 2009).

²⁵⁰ Letter from Michelle L. Pirzadeh to Peter Slaiby (July 27, 2009) (Attachment 39).

²⁵¹ Letter from Peter E. Slaiby to Gina McCarthy (January 4, 2010) (Attachment 40).

²⁵² Letter from Senators Lisa Murkowski and Mark Begich and Congressman Don Young to Michelle Pirzadeh (July 30, 2009) (Attachment 41).

We must however, express our disappointment that our organizations, locally affected communities, and the general public were not provided at least 45 days to comment on Shell's draft Beaufort air permit despite NSB's request for an extension of the comment period. While Shell is proposing to use the same vessels for both its Chukchi and Beaufort operations, there are significant differences between the draft permits for these operations proposed by EPA. Most notably, the Beaufort permit required additional analysis under Alaska's requirements for air permits that the Chukchi permit did not require. Numerous comment periods, hearings, and meetings with agency officials pertaining to Shell's operations have been held in recent months in our communities, so it is important that our requests for extensions of time be considered in light of the tremendous burden these exploration plans have placed on our communities.

The problems with Shell's request to EPA for a rushed permitting process came to light through a recent agency oversight. On March 16, 2010, less than a week before the comment period for the Beaufort permit closed, EPA released Appendix A to the public. Prior to this date, EPA had neglected to attach the Appendix to the statement of basis or upload it to the agency's website with the other relevant permitting documents. Appendix A includes information that is crucial to the public's analysis of the permit and the delay in receiving it is fatal to an informed public commenting process. Most importantly, this agency oversight provides evidence of the problems that arise through rushed permitting processes. If pressure on EPA caused the agency to neglect a simple attachment to the agency's own statement of basis, the public is left wondering what other mistakes and oversights the agency made while trying to comply with Shell's request for tight deadlines. Additionally, the generally disorganized state of the record for the permit also made it difficult to effectively provide public comment during the shortened public comment period. As these examples demonstrate, a rushed permitting process now may result in legally deficient permits that will even further delay Shell's proposed operations.

We ask that EPA re-open the comment period on Shell's Beaufort permit and provide the public with the time and the permit record it deserves to provide meaningful input on operations with significant meaning for our air quality. We also request that EPA provide a response to our comments and carefully consider the important legal and factual issues posed by Shell's permit applications before rushing to approve the permits by an arbitrary deadline.

Index of Attachments to AEW, ICAS, and NSB Beaufort OCS PSD Permit Comments

1. International Panel on Climate Change, Climate Change: 2007 Synthesis Report, at 30 (Attachment 1).
2. “Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle”, EPA420-F-05-004 February 2005 (Attachment 2).
3. EPA, Program Announcement: International Maritime Organization Adopts Program to Control Air Emissions from Oceangoing Vessels (2008) (Attachment 3).
4. EPA Methane Information (Attachment 4).
5. Fact Sheet -- Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (Attachment 5).
6. Background information on the Proposed Mandatory GHG Reporting Rule (Attachment 6).
7. Hyperion Energy Center BACT Analysis for CO₂ (March 2009) (Attachment 7).
8. “Fact Sheet Final Revisions to the National Ambient Air Quality Standards For Nitrogen Dioxide” (Attachment 8).
9. Letter from John Groll, MMS to EPA at 2 (Oct. 2, 2009) (Attachment 9).
10. AEW comments at 14 (Attachment 10).
11. EPA, Memorandum from Douglas E. Hardesty to Robert R. Robichaud, Re: Forest Oil Kustatan Facility and Osprey Platform Construction Permitting Applicability Determination (Aug. 21, 2001) (Attachment 11).
12. EPA, Memorandum from Director to Clyde B. Eller, Re: Shell Oil Company Wilmington Complex Specification of “Source” (May 16, 1980) (Attachment 12).
13. Shell Chukchi Sea ODPCP (Attachment 13).
14. EPA 420-S-06-002, Diesel Retrofit Technology: An Analysis of the Cost-Effectiveness of Reducing Particulate Matter Emissions from Heavy-Duty Diesel Engines Through Retrofits, March 2006, p. ii (Attachment 14).
15. EPA’s Emerging Technology list (Attachment 15).
16. Gekas I P, “NO_x Reduction Potential of V-SCR Catalyst in SCR /DOC/DPF Configuration Targeting Euro VI Limits from High Engine NO_x Levels”, Society of

Automotive Engineers (SAE), Document Number: 2009-01-0626, April 2009
(Attachment 16).

17. Servati H B, Petreanu S, Marshall S E, Su H, Marshall R, Wu C-H, Hughes K, Simons L, Berrimann L, Zabsky J, Gomulka T, Rinaldi F, Tynan M, Salem J, Joyner J, “A NOx Reduction Solution for Retrofit Applications: A Simple Urea SCR Technology”, SAE, Document Number: 2005-01-1857, April 2005 (Attachment 17).
18. TeamTec Marine Product Brochure (Attachment 18).
19. Wilson, Darcy, Richard Billings, Regi Oommen, and Roger Chang, Eastern Research Group, Inc. *Year 2005 Gulfwide Emission Inventory Study*, U.S. Department of the Interior, Minerals Management Services, Gulf of Mexico OCS Region, New Orleans, December 2007, Section 5.2.10 (Attachment 19).
20. EPA, Regulatory Announcement (Attachment 20).
21. Letter from Johnny Aiken, North Slope Borough, to Natasha Greaves and Dan Meyer, EPA Region 10 (May 11, 2007) (Attachment 21).
22. Damberg, Policies for Addressing PM 2.5 Precursors (Attachment 22).
23. Technical Support Document for the Proposed PM NAAQS Rule (Attachment 23).
24. <http://remsad.saintl.com/> (Attachment 24).
25. Uinta Basin Air Quality Study (UBAQS) News Release at <http://ipams.org/wp-content/uploads/2009/05/News-Release-UBAQS.pdf> (Attachment 25).
26. Four Corners Air Quality Task Force modeling info (Attachment 26).
27. EPA’s Proposed Revisions to National Standards for Ground-Level Ozone, January 6, 2010, Fact Sheet (Attachment 27).
28. WYDEQ [Sublette County Air Quality Information Page](#) (Attachment 28).
29. <http://www.starvalleyindependent.com/2009/03/governor-concerned-over-southwest-wyoming-ozone-levels/>. (Attachment 29).
30. NOAA’s press release (Attachment 30).
31. The North Slope Borough Region Emission Summary in Table 3.4.5-8 of the Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement, OCS EIS/EA MMS 2008-0055. Total permitted NOx emissions exceed 83,000 TPY and total permitted VOC emissions exceed 2,500 TPY Attachment 31).

32. Meeting notes from Greater Yellowstone Area Clean Air Partnership Annual Meeting, Pocatello, ID, October 17-18, 2007 (Attachment 32).
33. Barrow Snowmelt Date study performed by NOAA's Earth System Research Lab (Attachment 33).
34. World Data Center for Greenhouse Gases (Attachment 34).
35. Granier, C., U. Niemeier, J. H. Jungclaus, L. Emmons, P. Hess, J.-F. Lamarque, S. Walters, and G. P. Brasseur (2006), Ozone pollution from future ship traffic in the Arctic northern passages, *Geophys. Res. Lett.*, 33, L13807, doi:10.1029/2006GL026180 (Attachment 35).
36. Memo Re: Supplemental Information on the Ozone NAAQS, May 2008 (Attachment 36).
37. Health Assessment Document for Diesel Exhaust (Attachment 37).
38. Letter from Peter Slaiby, Vice President Shell Alaska to Michelle L. Pirzadeh, Acting Regional Administrator, EPA Region 10 (September 1, 2009) (Attachment 38).
39. Letter from Michelle L. Pirzadeh to Peter Slaiby (July 27, 2009) (Attachment 39).
40. Letter from Peter E. Slaiby to Gina McCarthy (January 4, 2010) (Attachment 40).
41. Letter from Senators Lisa Murkowski and Mark Begich and Congressman Don Young to Michelle Pirzadeh (July 30, 2009) (Attachment 41).