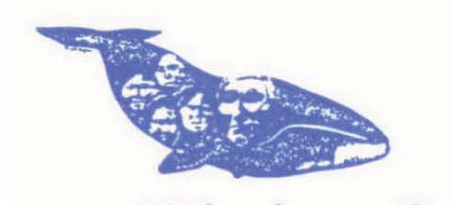




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August 5, 2011

Doug Hardesty
Air Permits Project Manager
Shell Discoverer Air Permits
EPA Region 10
1200 6th Avenue, Suite 900, AWT-107
Seattle, WA 98101
r10ocsairpermits@epa.gov

Re: Revised Draft Air Permits Proposed for Shell Oil and Gas Exploration Drilling in
Beaufort Sea and Chukchi Sea, Alaska

Dear Mr. Hardesty,

Thank you for the opportunity to comment on the revised draft air permits proposed for Shell oil and gas exploration drilling in the Beaufort Sea (Draft Beaufort Permit) and Chukchi Sea (Draft Chukchi Permit) and associated documents. Because of our continuing and unified interest in minimizing the impacts of air pollution in the Arctic, these comments are submitted jointly on behalf of the North Slope Borough (NSB), Alaska Eskimo Whaling Commission (AEWC), and the Iñupiat Community of the Arctic Slope (ICAS).

At the outset, we wish to express our sincere thanks to you and your colleagues for visiting the North Slope and discussing this proposed permit with the community and representatives from each of our organizations. We are encouraged by your efforts and submit these comments to assist you in your ongoing 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, NSB is the local municipal government of the area onshore from Shell's proposed activities in the Arctic. The protection of the health and welfare of our residents is our most important objective. Shell's activities will inevitably contribute to the contamination and degradation of the natural environment upon which our residents rely. We are concerned about the potential adverse health impacts from air emissions associated with Shell's proposed operations, which may be direct, indirect or cumulative in nature. NSB has developed air quality expertise to facilitate EPA's review of proposed air permits.

AEWC is a non-profit organization representing Iñupiat whaling captains in the eleven bowhead whale subsistence hunting villages of Kaktovik, Nuiqsut, Barrow, Wainwright, Point Lay, Point Hope, Kivalina, Little Diomedes, Wales, Gambell, and Savoonga. Our whaling captains and their communities rely upon the health of the Chukchi and Beaufort Sea ecosystems to provide the marine life that sustains our people and our culture. AEWC works to safeguard the hunt of the bowhead whale and the subsistence way of life that Arctic waters support. Our Iñupiat and Siberian Yupik whaling captains have thousands of years of traditional knowledge about the Arctic ecosystem. AEWC is also well versed in the current science regarding the health and status of the natural resources of the Arctic.

ICAS is the regional tribal government for eight villages on the North Slope that depend upon the marine mammals living in and migrating through Arctic waters. The Chukchi and Beaufort Seas are unique and diverse marine environments and have great cultural significance to the Iñupiat. Previous oil and gas activities in the region have caused direct conflicts with subsistence activities and resources. Because offshore oil and gas activities pose risks to the Iñupiat subsistence activities and cultural preservation, they require careful review.

Shell's proposed air emissions pose risks to the environment and our communities that are onshore from proposed operations. 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).

Given the potential impacts to our communities, we are concerned with the limited period of time allotted for public comment on these permits. As discussed more fully in the attached comments, the 30 days allowed for public comment on two major permits and a new modeling algorithm proved inadequate for NSB, AEWC, and ICAS to fully evaluate all aspects of the permits. While we do very much appreciate your visit to Barrow and your availability to discuss aspects of the permits, these conversations are not a replacement for an adequate opportunity to review the two permits, associated documents, and analysis.

There have been incremental improvements in the air emissions profile of Shell's proposed activities. However, we have identified areas where the proposed permits need revision to conform to the Clean Air Act and its regulations, where EPA may exercise its regulatory authority and discretion to better protect our residents, or where the permit language could otherwise be improved and clarified. As the attached comments set out in greater detail, these areas include:

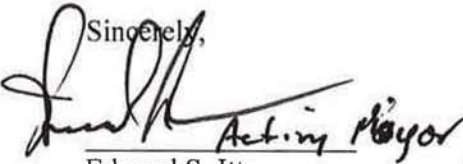
ICAS, AEWC, and NSB Comments to EPA Region 10 Re: Revised Draft Air Permits for Shell's *Discoverer* Exploration in Beaufort and Chukchi Seas (August 5, 2011).

- Ambient Air Quality Boundary
- OCS Source Definition
- Permit Conditions and Owner Requested Limitations
- Source Testing
- Monitoring
- Modeling Analysis
- Background Data
- Cumulative impacts
- New PM_{2.5} Increment
- Secondary Formation of Particulate Matter
- Ozone
- Environmental Justice Analysis

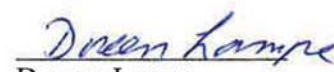
We ask that EPA take affirmative measures to address our concerns, both through permit conditions and through inspections of the *Discoverer*. A robust inspection program for the *Discoverer* is necessary to ensure that the air emission controls are actually implemented and effective. To date, we are unaware of any regulatory body or stakeholder representative inspecting or verifying the installation of required air emission control and monitoring equipment on the *Discoverer* and its associated fleet. As of this spring, Shell had not yet installed required emission control and monitoring equipment on the *Kulluk*, which Shell also plans to operate in the Arctic OCS next summer.

There are demonstrated and required means to considerably reduce the air emissions associated with Shell's plans. These means should be implemented to ensure 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, and please contact us if you have questions regarding these comments.

Sincerely,

Edward S. Itta
NSB
Mayor


Johnny Aiken
AEWC
Executive Director


Doreen Lampe
ICAS
President

Introduction

These comments are submitted on behalf of NSB, AEWC, and ICAS. Our communities have lived in the Arctic for many generations and depend upon the ocean and other natural resources for food and to sustain our culture. Residents are concerned about the impacts of pollution upon their lives and their ability to gather traditional foods from traditional places. We live in isolated areas and enjoy a lifestyle and diet that is radically different from other populations in the United States. The ocean is our garden. Operations that pollute the air contaminate our food sources and threaten our health.

Our communities also 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. Public health data demonstrate that Iñupiat are substantially more vulnerable to morbidity and mortality from air pollution than are other Americans. For example, rates of chronic lung disease on the North Slope are dramatically higher than in the general population in many areas in the United States. Oil and gas operations will likely have negative effects on air quality on the North Slope.

We thank Region 10 and Shell for their efforts to reduce the pollution emitted under these permits. Nevertheless, we are still concerned about the analysis conducted in support of the current levels of pollution that will be emitted under these permits. We ask that Region 10 assume these comments apply to both the Beaufort and the Chukchi air permits unless otherwise specified. We are incorporating our comments on the 2010 Chukchi and Beaufort permits and the 2009 Chukchi permit by reference.

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 amended the CAA to include the Outer Continental Shelf (OCS) program. The OCS program 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 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

¹ 42 U.S.C. § 7475.

² 42 U.S.C. § 7627(a)(1).

³ 40 C.F.R. part 55.

⁴ 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”).

Air Pollutants or NESHAPs) apply to the source. The potential for the OCS source to emit New Source Review (NSR) pollutants must be calculated and the OCS source must apply for a CAA Title V operating permit.⁵

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.⁶ 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. EPA most recently updated the OCS regulations in June 2011 to reflect the current COA requirements in Alaska.⁷

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."⁸ 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.⁹

Factual Background

A. Brief Background on the Proposed Operations.

Shell is proposing to conduct exploratory drilling operations in both the Beaufort and Chukchi Seas. Shell's current exploration plans include drilling four wells in Camden Bay in the Beaufort Sea and six wells in the Chukchi Sea.¹⁰ These operations include the use of a drillship – the *Discoverer* – and a fleet of additional vessels.

In the Beaufort this fleet of vessels includes:

Type of Vessel	Vessel Name
Drillship	<i>Discoverer</i> or <i>Kulluk</i> ¹¹
Primary Ice Management	<i>Nordica</i>
Secondary Ice Management / Anchor Handler	<i>Hull 247</i>
Resupply (shallow water)	<i>Arctic Seal</i>
Offshore Resupply Vessel (ORV)	<i>Harvey Explorer</i>
Waste Stream Transfer Vessel	<i>Carol Chouest</i>
Deck barge (temporary storage of waste)	<i>Southeast Provider</i>
Deck barge tug	<i>Ocean Ranger</i>
Waste Barge (for storage)	TBD
Waste Barge tug	TBD
Primary Oil Spill Response (OSR) barge	<i>Arctic Endeavor Barge</i>

⁵ 40 C.F.R. § 71.5(a)(1)(i).

⁶ 42 U.S.C. § 7627(a)(1).

⁷ 76 Fed. Reg. 37,274 (June 27, 2011).

⁸ EPA, Revised Stmt. of Basis at 17.

⁹ 42 U.S.C. § 7475(a)(4).

¹⁰ Shell, Camden Bay EP at 1-1-1-2; Shell, Chukchi EP at 1-1.

¹¹ Shell, Camden Bay EP at 1-3.

Primary Oil Spill Response Tug	<i>Point Oliktot Tug</i>
OSR Liquid Storage & Refuel Supply Vessel (OST)*	<i>Mikhail Ulyanov</i>
OSR Containment barge*	Barge
OSR Containment barge tug*	Invader Class tug
Anchor Handler for Containment barge*	TBD
Secondary Relief Well Drilling Vessel*	<i>Kulluk or Discoverer</i> ¹²
Chukchi OSR Barge ^{13*}	
Chukchi OSR Barge Tug*	
Chukchi OSR Vessel*	
Science Vessel ¹⁴	
West Dock Shuttle ¹⁵	
Lamor brush skimmer ^{16*}	
Lamor brush skimmer*	
34-foot workboat*	
34-foot workboat*	
34-foot workboat*	
Transrec 150 skimmer*	
Transrec 150 skimmer*	

* Indicates vessels that are not part of the immediate operations – *i.e.*, they are neither within 25 miles of the *Discoverer* or part of the fleet that will remain in the vicinity of the *Discoverer* but outside the 25 mile boundary.

The vessels proposed for use in the Chukchi are similar but not identical to those used in the Beaufort.

Shell is proposing to pre-lay the anchors of the drillship with icebreaker #2. Pre-laying the anchors and connecting the *Discoverer* to the anchors will take up to 44 hours:

The *Noble Discoverer* will transit to the location using its own power. When approximately 1 mile outside the pre-laid anchor buoy pattern the *Noble Discoverer* will stop and from that point will be moved by the AHTS acting in towing mode and connected by a tow line. When the *Noble Discoverer* is connected to the AHTS, the *Noble Discoverer*'s main engine will be stopped so that thrust from the direct coupled propeller will not interfere with the AHTS' ability to control and position the *Noble Discoverer*, but will remain available on standby for restart in case of an emergency that requires the *Noble Discoverer* to be moved from the location.¹⁷

¹² Shell, Camden Bay EP at 2-6.

¹³ Shell, Camden Bay EP at 8-1. This citation contains information about the vessels from the Chukchi OSR Barge to the Chukchi OSR vessel.

¹⁴ Shell, Camden Bay EP at 10-2.

¹⁵ Shell, Camden Bay EP at 15-5.

¹⁶ Shell, Beaufort Sea Regional Exploration Oil Discharge and Prevention Contingency Plan at 1-71 (revised Jan. 2010 plan). This citation is for the remaining vessels in the list.

¹⁷ Anchor_handling_2_final at 11.

All told, substantial air pollution will be emitted as a result of Shell’s operations. Documents provided by Region 10 demonstrate that Shell’s operations have the potential to emit¹⁸ the following amounts of pollutants:

	NO _x	PM _{2.5}	PM ₁₀	CO	VOC	SO ₂	NH ₃	CO _{2e}
Potential to Emit (tons per year) ¹⁹	336	21	22	154	43	1.3	0.52	149,794

B. Brief History of these Air Permits.

In 2007, communities along the North Slope of Alaska successfully sought review of minor source air permits issued to Shell. *In re Shell Offshore Inc.*, OCS Appeals Nos. 07-01; OCS 07-02. In 2008, a second petition for review was filed over the second set of minor source permits issued to Shell. *In re Shell Offshore, Inc.*, OCS Appeal Nos. 08-01; 08-02; and 08-03. Those petitions were dismissed when Shell withdrew the permits. In 2010, review was sought of two major source air permits issued to Shell for work in the Beaufort and Chukchi Seas. Those air permits were remanded to Region 10 in 2010. *In re Shell Offshore, Inc.*, OCS Appeal Nos. 10-01-04.

COMMENTS

A. The Opportunity for Public Comment provided by Region 10 is Inadequate.

The 30-day public comment period on these two PSD permits is inadequate. Region 10 is accepting public comment on four air permits this summer, in addition to the numerous other ongoing permitting and regulatory measures undertaken by other state and federal agencies.²⁰ Region 10 provided an overlapping 30-day comment period from July 6 to August 5 for two revised major source OCS PSD permits for Shell’s *Discoverer* – one for operations in the Beaufort Sea, the other for operations in the Chukchi Sea. In association with these two permits, Region 10 also specifically solicits public comment on the new modeling algorithms used in support of the permit to predict air pollutant concentrations. And, 16 days into this 30-day comment period, Region 10 opened the 46 day public comment period (from July 22 until September 6) for two more air permits – one for Shell to operate the *Kulluk* drilling rig in the Beaufort Sea and another for ConocoPhillips to operate a jack-up drill rig in the Chukchi Sea.

¹⁸40 C.F.R. § 52.21 (b)(4) (“Potential to emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable. Secondary emissions do not count in determining the potential to emit of a stationary source.”)

¹⁹ These figures are from: EPA, Review of Shell’s Ambient Air Quality Analysis (6-24-2011) and Shell, *Discoverer* Update (4-15-2011).

²⁰ For example, just during the month of July BOEMRE set three significant comment deadlines. BOEMRE solicited public comment on a revised draft supplemental environmental impact statement for lease sale 193 (comment deadline July 11), an environmental assessment for Shell’s Camden Bay Exploration Plan (comment deadline July 15), and the OCSLA review of Shell’s Exploration Plan and Oil Discharge Prevention and Contingency Plan (comment deadline July 25).

Region 10 has provided a total of 60 calendar days for stakeholders to review four different air permits, all of which are technically and legally complex. This public comment schedule has effectively limited stakeholders to 15 days to review each air permit.

Public participation is at the core of the Clean Air Act's (CAA) Prevention of Significant Deterioration (PSD) program.²¹ In fact one of the main purposes of the permitting program, as identified in section 106 of the CAA, is to “assure that any decision to permit increased air pollution in any area . . . is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for *informed* public participation in the decisionmaking process.”²² CAA regulations carry through with this articulated purpose, identifying 30 days as the absolute minimum period for public comment on an individual draft PSD permit.²³

EPA’s Environmental Appeals Board (EAB) has repeatedly emphasized the importance of adequate opportunity for informed public participation, referring to CAA section 160 as a “statutory directive” and describing public participation as having a “central role” in PSD permitting.²⁴ A number of factors can contribute to a finding of inadequate opportunity for public participation, including: technical complexity of the PSD regulations and the permit, the voluminous relevant documents, and a large number applications being submitted in a short period of time.²⁵ The EAB has specifically identified four-month comment period extensions for PSD permits as appropriate.²⁶ The EAB has also noted that the Administrator may not approve a final permit if the public does not have access to relevant information and that lack of access “forecloses ‘meaningful assessment’ of the issues and prevents the public ‘from making meaningful substantive comments.’”²⁷

AEWC, ICAS and NSB objected to the proposed comment periods in a June 15, 2011 letter to EPA requesting a minimum of 45 days to comment on each of the four air permits open for public comment, with no overlap in the comment periods. We noted the volume of material

²¹ *In the Matter of the Proposed Operating Permit for: Louisville Gas & Electric to Operate the Proposed Source Located at 487 Corn Creek, Bedford, Trimble County, Kentucky Proposed by the Commonwealth of Kentucky, Environmental and Public Protection Cabinet*, 2006 WL 6676160, Permit No. V-02-043 Revision 2 Source I.D. No. 21.223-00002 (EAB March 2, 2006); Clean Air Act §160(5), 42 U.S.C. § 7470(5).

²² Clean Air Act §160(5), 42 U.S.C. § 7470(5) (emphasis added).

²³ 40 C.F.R. § 124.10(b)(1) (“Public notice of the preparation of a draft permit (including a notice of intent to deny a permit application) required under paragraph (a) of this section shall allow at least 30 days for public comment.”)

²⁴ *In Re: Russell City Energy Center*, 2008 WL 3047431, PSD Appeal No. 08-01 (EAB July 29, 2008); *In re. Rockgen Energy Center*, 8 E.A.D. 536, 557 (EAB 1998); *see also In re .Antochem N. Am.*, 3 E.A.D. 498 (Adm’r 1991).

²⁵ *In the Matter of the Proposed Operating Permit for: Louisville Gas & Electric to Operate the Proposed Source Located at 487 Corn Creek, Bedford, Trimble County, Kentucky Proposed by the Commonwealth of Kentucky, Environmental and Public Protection Cabinet*, 2006 WL 6676160, Permit No. V-02-043 Revision 2 Source I.D. No. 21.223-00002 (EAB March 2, 2006).

²⁶ *In Re: Russell City Energy Center*, 2008 WL 3047431, PSD Appeal No. 08-01 (EAB July 29, 2008).

²⁷ *In the Matter of the Proposed Operating Permit for: Louisville Gas & Electric to Operate the Proposed Source Located at 487 Corn Creek, Bedford, Trimble County, Kentucky Proposed by the Commonwealth of Kentucky, Environmental and Public Protection Cabinet*, 2006 WL 6676160, Permit No. V-02-043 Revision 2 Source I.D. No. 21.223-00002 (EAB March 2, 2006) (citing *In Re: Indeck-Elwood, LLC*, 13 E.A.D. 126, PSD Appeal 03-04 (Sept. 27, 2006); *Sierra Club v. State Bd. of Forestry*, 876 P.2d 505, 519 (Cal. 1994); *Friends of the Clearwater v. McAllister*, 214 F. Supp. 2d 1083, 1089 (D. Mont. 2002); *Sierra Club v. Johnson*, 436 F.3d 1269 (11th Cir. 2006)).

associated with each of the four permits and stated that without separate 45-day comment period it would be impossible for us to provide meaningful written comments or otherwise adequately participate in the public process.

We received a response from EPA on July 26, 2011, denying an extension or separate comment periods for these four air permits. This letter emphasized opportunities for North Slope organizations and residents to meet with EPA permitting officials, argued that the issues open for comment on the *Discoverer's* permits are limited to those identified in the EAB remand and therefore should require less time to review, and suggested that the similarities of the new minor source permits makes a combined comment period appropriate. The letter stated that EPA must adhere to its original schedule with overlap in comment periods “in order to fulfill our responsibility for issuing timely permits.” EPA expressed concern that “a short delay in permit issuance can result in a long delay in exploration” and noted that the agency has “mandatory deadlines” to meet.

Region 10’s response to our request for an extension of the public comment period is not satisfactory and does not reflect the degree of importance that the Clean Air Act and its implementing regulations, or the EAB, place on adequate opportunity for informed and meaningful public involvement. First, the opportunity to meet with EPA permitting officials, while certainly appreciated, does not compress the time required to review the voluminous material. Nor does a conversation with EPA officials substitute for an independent review of the new modeling algorithms and model performance evaluations upon which we will rely to ensure that the permitted pollution will not adversely affect our air quality or the health of our residents.

Second, while Region 10 limits the issues for comment on *Discoverer's* PSD permits to those issues identified by the EAB remand, these issues are complex and include the review of an entirely new modeling algorithm. We contacted a number of modeling experts, requesting a thorough review of the modeling, but we were told that it would be very difficult, if not impossible, to produce a comprehensive analysis of the model in the comment period provided by EPA. Also, the two permits apply to two very different geographic areas with different physical conditions.

Region 10 also argues that because the permits issued to Shell for the *Kulluk's* operations in the Beaufort Sea and to ConocoPhillips for a jack-up rig to operate in the Chukchi Sea are both minor source permits that this makes a combined comment period appropriate. But these drilling rigs and air emission sources are very different and address air emissions in different ways and in different geographic areas. Each can create different and significant impacts. By stating that simultaneous review of two permits is efficient, Region 10 is ignoring the complexity of each permit and their obvious differences.

Finally, Region 10’s statements that the overlapping comment periods are necessary “to fulfill our responsibility for issuing timely permits,” to avoid delays in industry plans, and to meet “mandatory deadlines” are likewise unconvincing.²⁸ The CAA establishes a 12-month

²⁸ Presumably, this is a reference to CAA §§165 and 503 which set out deadlines by which EPA must grant or deny air permits. §165 requires EPA to grant or deny a completed PSD permit within one year; §503 requires EPA to grant or deny a completed Title V permit application within 18 months. 42 U.S.C. §7475; 42 U.S.C. §7761b(c).

deadline by which EPA must approve or deny a PSD permit, and an 18-month deadline by which EPA must approve or deny a Title V permit. It is difficult to see how these deadlines dictate a rush to review and issue the ConocoPhillips permit. ConocoPhillips submitted supporting information as recently as July 19, 2011, and the requested permit will apply to activity that is not scheduled to begin for two years. And EPA has plenty of time remaining within which to review the *Kulluk* application and to address the *Discoverer* remand. Nor should the limited operating season drive how quickly EPA reviews permit applications. It is the operator's responsibility to submit an application in a timely manner, allowing for adequate public comment periods and proposing acceptable emission controls. This permitting blitz violates the clear mandate in the CAA to allow adequate time for informed and meaningful public participation and shortchanges the stakeholders who will bear the adverse effects of the permitted activity.

Now, half-way through the 60 days allotted for public review and comment of four air permits and at the end of the comment period for the two *Discoverer* PSD permits, we reiterate our request that EPA extend the public comment periods. At a minimum, 45-day comment periods for each air permit, without overlap, are needed for our staff and experts to comprehensively review these permits.

B. EPA Inspection Request.

EPA has the authority to conduct physical inspections of a permitted OCS source.²⁹ The condition of the *Discoverer* and installation status of air emission control and monitoring equipment is unclear. No state, federal agency or stakeholder group has boarded the *Discoverer*, inspected it, nor verified whether required upgrades have actually been completed. We do know that the *Discoverer* is reported to be undergoing repairs after sustaining damage during a storm in May 2011.³⁰ Also, NSB staff and representatives toured Shell's other Arctic drilling rig, the *Kulluk*, on March 1, 2011 and found the rig was not in drill-ready condition, and that many of the upgrades and improvements Shell had announced had not been completed.

Because the physical condition of engines and other equipment on both the *Discoverer* and *Kulluk* are unknown, NSB, AEWC and ICAS request that EPA exercise its authority to inspect Shell's exploration fleet to ensure compliance with permit requirements. These inspections should occur both before and during the operating season. The pre-drill inspections should be completed well in advance of the operating season. That way, if the inspectors identify problems with any source or equipment, Shell will have adequate time to undertake appropriate repairs or upgrades. And finally, we request that EPA promptly share the records, reports, and information gained from physical inspections of the rig and support fleet with the public.³¹ If EPA does not have the requisite resources to dedicate to Arctic OCS, we ask that EPA coordinate with BOEMRE or other federal agencies to ensure compliance with air permit conditions.

²⁹ 42 U.S.C. §7414; 40 C.F.R. §55.8.

³⁰ Taranaki Daily News, "Twinkle, twinkle, damaged drillship" (May 11, 2011) (available at <http://www.stuff.co.nz/taranaki-daily-news/news/4987045/Twinkle-twinkle-damaged-drillship> (last viewed August 2, 2011))(Attachment 1).

³¹ 42 U.S.C. §7414(c).

C. Ambient Air Quality Boundary.

Shell has requested and Region 10 has agreed to a 500-meter ambient air quality boundary around the *Discoverer*.³² Shell has proposed to have the Coast Guard designate a safety zone within this area.³³ The boundary of the ambient air quality region will be enforced by Shell by “radio, physical contact or other reasonable measures”³⁴

Allowing OCS sources to establish such boundaries in the Arctic raises concerns regarding the cumulative impacts to offshore air quality that several such operations with ambient air quality boundaries would have on air quality. EPA has been subject to scrutiny for creating ambient air boundaries in the first instance because they allow for greater air quality deterioration.³⁵ Region 10 should explain why this boundary works in the Arctic and how it arrived at the decision to allow more pollution instead of less, particularly in light of the heavy use of offshore areas by subsistence communities.³⁶

Additionally, if this boundary remains in place, EPA should examine options for requiring monitoring at 500 meters from the *Discoverer* for the first two weeks of the drilling season. We are not aware of any reasons why it would not be technologically feasible to operate monitoring equipment from a moored vessel.

D. The Definition of OCS Source Requires Modification.

We thank Region 10 and Shell for concluding that the *Discoverer* becomes an OCS source once the ship’s main anchor is attached to the seabed floor. But the process by which an icebreaker will set the anchors for the *Discoverer* before it is deemed a source undermines this finding. Shell has indicated that approximately 44 hours are required to set the anchors allowing for a significant amount of pollution that is not regulated as part of the OCS source.³⁷

In the last set of permits for the *Discoverer*, we were concerned that if the drillship was not deemed an OCS source until all its anchors were set, then emissions from the icebreaker/anchor handler generated from setting the anchors would not be included within the potential to emit for the permits. Obviously, this concern has not been addressed by the current proposal.

³² EPA, Supp. Stmt. of Basis at 26.

³³ EPA, Supp. Stmt. of Basis at 26.

³⁴ EPA, Supp. Stmt. of Basis at 26 (“Shell has also stated in its application materials that Shell will develop in writing and implement a public access control program to locate, identify and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the area within 500 meters of the *Discoverer*.”)

³⁵ GAO, EPA’s Ambient Air Policy Results in Additional Pollution (Attachment 2) (available at: <http://archive.gao.gov/d26t7/139340.pdf>).

³⁶ EPA notes that “[r]esolving point of compliance questions is not necessary in these permitting actions” EPA, Supp. Stmt of Basis at 17. As a result, we are not providing comment on this issue aside from encouraging Region 10 to maintain its previous position.

³⁷ Shell, EIA for the Camden Bay Exploration Plan at 2-25.

The draft permit specifically provides that “[t]he *Discoverer* is an ‘OCS Source’ at any time the *Discoverer* is attached to the seabed **at a drill site** by at least one anchor.”³⁸ We disagree that the statutory and regulatory language requires the *Discoverer* to be at a drill site in order to be an OCS source.

Under section 328 of the CAA, an OCS source is any equipment, activity or facility which: 1) has the potential to emit air pollutants, 2) is regulated or authorized under OCSLA, and 3) is located on the OCS or in the waters above the OCS.³⁹ This includes “drillship exploration.”⁴⁰ The regulatory definition includes the statutory language and adds that vessels are OCS sources when they are “(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” OCSLA or “(2) Physically attached to an OCS facility, in which case only the stationary source aspects of the vessels will be regulated.”⁴¹ Because a vessel is an OCS source when it is “temporarily” attached to the seabed, “may be used” for the purpose of exploring for oil and gas resources, and is in an area authorized by OCSLA (*i.e.* Shell’s lease blocks) the *Discoverer* – a drillship – should be considered to be an OCS source whenever it drops a single anchor within Shell’s lease blocks.⁴² Put more simply, once a drill ship arrives at the permittee’s lease blocks and drops an anchor it is attached to the seabed and erected thereon. In the event Shell anchors the *Discoverer* within a Shell lease block while the icebreaker is dropping the anchors, then it should be considered to be an OCS source and the emissions from the icebreaker counted in the potential to emit.⁴³

To further address this issue, we ask that Region 10 require Icebreaker #1, which has pollution controls installed on it, to set the anchors rather than Icebreaker #2, which does not.

³⁸ EPA, Draft Beaufort Permit at 16.

³⁹ 42 U.S.C. § 7627(a)(4)(C).

⁴⁰ 42 U.S.C. § 7627(a)(4)(C).

⁴¹ 40 C.F.R. § 55.2.

⁴² As the EAB noted in the most recent remand decision, section 4(a)(1) of OCSLA, to which the regulatory definition of OCS source refers, uses the term “which may be” in connecting the “attached to the seabed” requirement to the latter two phrases. *See Shell II*, slip op. at 51 n.61; 43 U.S.C. § 1333(a)(1) (applying to —all installations and other devices permanently or temporarily attached to the seabed, *which may be* erected thereon for the purpose of exploring for, developing, or producing resources therefrom” (emphasis added); *cf. Alliance to Protect Nantucket Sound, Inc. v. United States Dep’t of the Army*, 288 F. Supp. 2d 64, 75 (D. Mass. 2003) (holding that OCSLA’s —which may be clause is not restrictive, and that —authority extends to all _artificial islands, installations, and other devices located on the seabed, to the seaward limit of the [OCS], including, but not limited to, those that _may be used to explore for, develop, or produce resources), *aff’d on other grounds*, 398 F.3d 105 (1st Cir. 2005). Region 1 of EPA noted as much in its recent response to comments on OCS permits for the Cape Wind facility off the coast of Massachusetts. Region 1, EPA Permit No. OCS-R1-01 Cape Wind Energy Project RTC at 13.

⁴³ For this same reason, if any other vessel associated with Shell’s operations anchors to the sea bed floor, it too should be considered a source. This is because the provision of OCSLA to which the regulatory definition of OCS source refers was amended in 1978 to ensure that platforms constructed outside the United States and erected on the OCS were subject to U.S. customs laws. H.R. Conf. Rep. 95-1474 at 81, reprinted in 1978 U.S.C.C.A.N. 1674, 1679. In making this amendment, Congress clarified that “federal law is to be applicable to all activities on all devices in contact with the seabed for exploration, development, and production.” H.R. Conf. Rep. 95-1474 at 81, reprinted in 1978 U.S.C.C.A.N. 1674, 1679.

E. Requested Permit Conditions and Changes to Owner Requested Limitations that are not Enforceable.

1. Permit Conditions that should be included in the permits.

We request that the Beaufort permit contain a condition like the one Shell agreed to in the Kulluk air permit, namely that the company will not operate more than one drill ship in the Beaufort at the same time. Alternatively, if more than one drill ship is allowed to operate at the same time in the Beaufort Sea, then EPA must conduct additional modeling to assess the cumulative impacts of these multiple and concurrent operations and ensure compliance with relevant air quality standards before the operations are allowed to proceed.

In order to protect air quality, we ask that Shell use icebreaker #1 to pre-lay the anchors instead of icebreaker #2, which does not have Selective Catalytic Reduction (SCR) installed.⁴⁴

Additional permit conditions and changes to permit conditions are discussed throughout these comments.

2. Owner requested limitations that require revision.

The draft permits contain several owner-requested limitations and resulting permit provisions designed to limit Shell's potential to emit. These limits excuse Shell from performing a BACT analysis for certain pollutants (*e.g.*, CO_{2e}), and the limits keep Shell from violating the NAAQS (*e.g.*, NO₂). In order for these provisions to operate as intended they must be both 1) "federally enforceable as defined by 40 C.F.R. Sections 52.21(b) (17), 51.165(a) (1) (xiv), 51.166(b) (17) . . . ; and 2) . . . enforceable as a practical matter."⁴⁵ A range of limitations is possible including:

restrictions over a given period of time on the amount of a pollutant which may be emitted from a source into the outside air. Production limits are restrictions on the amount of final product which can be manufactured or otherwise produced at a source. Operational limits are all other restrictions on the manner in which a source is run, including hours of operation, amount of raw material consumed, fuel combusted, or conditions which specify that the source must install and maintain add-on controls that operate at a specified emission rate or efficiency.⁴⁶

When both production and operational limits are used they "must be stated as conditions that can be enforced independently of one another."⁴⁷ For example, EPA guidance explains that

⁴⁴ See EPA, Revised Stmt. of Basis at 33. The Revised Statement of Basis states only that icebreaker #1 will have both SCR and OxyCat installed and that icebreaker #2 will only have OxyCat installed. *Id.* at 32-33. The draft permits, however, require both icebreakers to install both SCR and OxyCat. Beaufort Permit at Condition P.1; Chukchi Permit at Condition O.1. If the draft permits are correct and the intent is to have both controls on both icebreakers, then please disregard this comment.

⁴⁵ EPA, Limiting Potential to Emit in New Source Permitting at 2 (1989).

⁴⁶ EPA, Limiting Potential to Emit in New Source Permitting at 5 (1989).

⁴⁷ EPA, Limiting Potential to Emit in New Source Permitting at 6 (1989).

“restrictions on fuel which relates to both type and amount of fuel combusted should state each as an independent condition in the permit.”⁴⁸

The duration of these limitations is key to their success. EPA guidance recommends “a one month limit” as the “maximum time EPA should generally accept for avoiding a PSD/NSR threshold.”⁴⁹ Only when seasonal variations come into play and the “source is unable to use the monthly limit” are “rolling periods of longer durations . . . also acceptable for determining applicability to major source review.”⁵⁰ First, the permitting authority is to consider “the possibility of imposing a month-by-month limit.”⁵¹ If that is not feasible, then the maximum the agency may agree to is a “twelve month rolling” time period.”⁵² “Under no circumstances would a production or operation limit expressed on a calendar year annual basis be considered capable of legally restricting potential to emit.”⁵³

The draft permits define the duration of operations and specify that the “permittee shall only conduct exploration drilling operations in the Beaufort Sea between July 1 and November 30 each year (referred to hereafter as the “drilling season”).”⁵⁴ We ask that EPA add to the list of “Prohibited Activities” the operation of the vessels between December 1 and June 30.⁵⁵

The Statement of Basis fails to explain why monthly limits could not be imposed in this situation and why Shell was leniently provided the 12-month rolling emissions limits for certain pollutants. Instead, the Statement of Basis notes that “because the annual NAAQS are set based on calendar years, the restriction can similarly apply on a calendar year basis (or, in the case of these permits, a drilling season which is limited by the permit to a specific 5-month period out of any calendar year).”⁵⁶ This statement is misleading because it implies that Shell is complying with the NAAQS and other standards during the limited drilling season instead of taking a rolling 12-month timeframe in which to document compliance.

3. Carbon dioxide equivalent provisions are not enforceable.

Shell has the potential to emit 149,794 tons per year (tpy) of CO_{2e}.⁵⁷ This is substantial and far exceeds the provisions in the Tailoring Rule that trigger the need for a BACT analysis. Shell has requested limitations in its permits in an effort to bring its CO_{2e} emissions below the trigger for a BACT analysis (*i.e.*, below 75,000 tpy). The draft permits provide that:

⁴⁸ EPA, Limiting Potential to Emit in New Source Permitting at 6 (1989).

⁴⁹ Edward Reich, Memorandum Time Frames for Determination of Applicability to New Sources (March 13, 1986).

⁵⁰ Edward Reich, Memorandum Time Frames for Determination of Applicability to New Sources (March 13, 1986).

⁵¹ EPA, Limiting Potential to Emit in New Source Permitting at 10 (1989).

⁵² Edward Reich, Memorandum Time Frames for Determination of Applicability to New Sources (March 13, 1986).

⁵³ EPA, Limiting Potential to Emit in New Source Permitting at 10 (1989).

⁵⁴ EPA, Draft Beaufort Permit at 25; EPA, Draft Chukchi Permit at 18.

⁵⁵ See EPA, Limiting Potential to Emit in New Source Permitting at 10 (1989) (“Rolling limits could be used as well for sources which shut down or curtail operation during part of a year on a regular seasonal cycle, but the permitting authority should first explore the possibility of imposing a month-by-month limit. For example, if a pulp drier is periodically shut down from December to April, the permit could contain a zero hours of operation limit for each of those months, and then the appropriate hourly operation limit for each of the remaining months.”).

⁵⁶ EPA, Revised Stmt. of Basis at 33.

⁵⁷ Shell, Update – Discoverer Drillship (April 12, 2011).

[a]t all times while the *Discoverer* is an OCS Source, greenhouse gas (GHG) emissions as defined in 40 CFR § 52.21(b)(49) from the *Discoverer* and Associated Fleet, when within 25 miles of the *Discoverer*, shall not exceed 70,000 tons carbon dioxide equivalent (CO_{2e}) as determined on a rolling 12-month basis by calculating the emissions (tons) for each month and adding the emissions (tons) calculated for the previous 11 months.⁵⁸

This provision is not enforceable. It is neither a production nor an operational limit. The OCS regulations provide that “[a]ny physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable.” 40 C.F.R. § 52.21(b)(4). The permit provision fails to limit the amount of final product, the hours of operation, amount of material consumed, or fuel combusted, and it does not specify controls for the emissions. Instead, this provision is an unenforceable restriction on the amount of a pollutant that Shell can emit. This provision cannot therefore be relied on to lower Shell’s potential to emit CO_{2e}.

4. Inadequate monitoring provisions render other permit provisions unenforceable.

The permits also contain 12-month rolling calculations for the total amount of fuel combusted and for the total amount of waste incinerated in order to limit the production of CO_{2e}.⁵⁹ As an initial matter, we question whether the fuel and waste combustion limits are practical, let alone enforceable.

The monitoring provisions related to these conditions provide for monthly calculations based on the amount of fuel or waste combusted.⁶⁰ We question whether these provisions and similar provisions in the permits for SO₂ and NO_x⁶¹ are legitimate.

Under certain circumstances, EPA’s guidance provides that emission limits are “sufficient to limit potential to emit” when they include “requirements to install, maintain, and operate a continuous emission monitoring (CEM) system and to retain CEM data, and specifies that CEM data may be used to determine compliance with the emission limit.”⁶² We believe the circumstances presented by the *Discoverer* permits warrant CEM in order for these permit conditions to be enforceable. (This request is discussed below in the monitoring section). The provisions in the draft permits are based on a new model and new algorithms that have not been tested for the Arctic. Given the uncertainties with the modeling upon which these permit provisions are based, only monitoring the combustion of fuel or waste will not protect air quality.

⁵⁸ EPA, Draft Beaufort Permit at 27; EPA, Draft Chukchi Permit at 20.

⁵⁹ EPA, Draft Beaufort Permit at 27; EPA, Draft Chukchi Permit at 21.

⁶⁰ EPA, Draft Beaufort Permit at 28; EPA, Draft Chukchi Permit at 21-22.

⁶¹ EPA, Draft Beaufort Permit at 62, 66, 68, 71, 75, 80.

⁶² EPA, Limiting Potential to Emit in New Source Permitting at 8 (1989).

5. Questions regarding the duration of Shell’s operations.

EPA’s guidance recognizes that in certain instances a permittee may request limits on its operations to avoid new source review (and the accompanying BACT analysis) when in reality these limits are not how the permittee intends to conduct its operations.⁶³ We are concerned that this may be the case, that operations may not be conducted in line with these limits, because the requested limits are not reflected in other permitting submissions. For example, Shell agrees to certain restrictions in the *Discoverer* air permits that are not reflected in Shell’s Exploration Plan (submitted to BOEMRE) nor reflected in Shell’s Incidental Harassment Authorization (IHA) application that accompanies that plan.

Table 2: Comparison of Days of Operations; Days Drilling; and Days Constructing Mud Line Cellar (MLC) and Drilling

Permit or Authorization	Total Number of Days of Operations	Number of Days Drilling	Total Number of Days Drilling
PSD Permit	120 days	48 days	67 days including MLC construction
Exploration Plan ⁶⁴	Each Torpedo Well about 54 days	Each Torpedo Well 44 days	Each Torpedo Well 49 days
	Each Sivulliq Well about 44 days	Each Sivulliq Well 34 days	Each Sivulliq Well 39 days
IHA Application ⁶⁵	89 days	78 days	78 days

Based on the restrictions Shell has agreed to in its air permit application and the information in its Exploration Plan on the amount of time various activities take, Shell could drill only one well in Camden Bay this year. Please confirm that this in fact is Shell’s intent.

F. Source Testing and Monitoring Comments.

1. EPA’s proposed monitoring and recording requirements are not sufficient to assure compliance with the hourly NO_x limits.

EPA’s proposed revised permits include hourly emission limits for NO_x.⁶⁶ EPA’s proposed monitoring and reporting requirements are not adequate to demonstrate compliance with these hourly limits. Each day, Shell would be required to calculate and record (for the previous day), emissions of NO_x in pounds per hour by using the emission factors for each source collected under the stack testing requirements for that source⁶⁷ and the electrical load data

⁶³ EPA, Limiting Potential to Emit in New Source Permitting at 10-11 (1989).

⁶⁴ Shell, EIA for the Camden Bay Exploration Plan at 2-25 (2011).

⁶⁵ Shell, IHA Application at 17 (available at: http://alaska.boemre.gov/ref/ProjectHistory/2012Shell_BF/revisedEP/Appendix%20C.pdf).

⁶⁶ See, e.g., Beaufort Sea Permit Conditions C.5, E.4, F.4, G.5, H.5, I.6, J.5, K.4, O.7, P.6, Q.2, R.3, and Chukchi Sea Permit Conditions C.5, E.4, G.6, H.5, I.6, J.4, K.4, N.6, O.6, P.2, and Q.3.

⁶⁷ See, e.g., Condition C.8.5 for the Discoverer Generator Engines.

or fuel usage data collected for that source. Since the NO_x emission rates presumably vary hour by hour, using emission factors based on a one-time stack test conducted at the beginning of a drilling season (and in some cases only the first season) does not ensure continuous compliance with an hourly limit. There is no guarantee that these hourly limits can be complied with for each hour of operation and that the hourly emissions will stay at the emission rates modeled without more precise monitoring requirements.

The only way to ensure continuous compliance with the hourly limits is with the use of continuous emissions monitoring systems. EPA must require the use of continuous emissions monitors (CEMs), or equivalent, for NO₂ compliance. If there is some technical reason why CEMs are not feasible for these sources then EPA must require more frequent stack testing (e.g., at the beginning of *each* season from every source) and must require the use of the **highest** stack test results in its hourly calculations. Specifically, Permit Conditions C.9.5, O.14.12, P.13.12, Q.5.7 in both the Beaufort Sea and Chukchi Sea permits must be changed to read:

*Each day, calculate and record for the previous calendar day, the emissions of NO_x, in pounds per hour and pounds per day and the emissions of PM_{2.5} and PM₁₀ in pounds per day from each engine by using the **highest** emission factors for each tested engine collected under Condition C.8.5 and electrical load data collected under Condition C.9.3, to determine emissions from that source. Emissions shall be calculated for each ten-minute load reading for each engine.*

Additionally, we appreciate Shell agreeing to install SCR and OxyCat pollution controls on icebreaker #1 and to install OxyCat (and perhaps SCR) on icebreaker #2.⁶⁸ However, we are concerned about how these controls will function in arctic conditions. As Region 10 notes, it “believes that the SCR and OxyCat systems will be effective *if the inlet temperature to each system is high enough*, the urea feed to the SCR system is operating, and the catalysts are still active.”⁶⁹ Because the proper functioning of these controls is essential to compliance with the NO₂ NAAQS, we reiterate our request for CEM for these systems (instead of weekly measurements with a portable device).

2. EPA must include a requirement to submit reporting data to EPA on a periodic basis.

The proposed revised permits do not include a provision to submit reporting data to EPA. Instead, the permits only require that Shell keep records of the required monitoring data and support information for a period of five years.⁷⁰ Please revise the permits to require submission of reporting data to EPA in a timely manner.

⁶⁸ See e.g., Beaufort Permit at 74; see also Footnote 47.

⁶⁹ EPA, Revised Stmt. of Basis at 35 (emphasis added).

⁷⁰ Permit Conditions A.11 in the Beaufort Permit and A.9 in the Chukchi Permit.

3. The addition of sulfur to the ultra low sulfur fuel during transport must be accounted for in the permits.

The draft permits prohibit the combustion of “any liquid fuel with sulfur content greater than 0.0015 percent by weight, as determined by Condition B.7.1, in any emission unit on any vessel in the Associated Fleet.”⁷¹ The permits further provide that Shell, “[w]ithin 3 business days of identification, report to the EPA any instance of a liquid fuel with sulfur content greater than 0.0015 percent by weight being combusted in any emission unit on the *Discoverer* (except Unit FD-7).”⁷²

Again, we commend Shell’s commitment to purchase ultra low sulfur fuel – fuel of 15 ppm of sulfur per weight or less – for its operations. However, upon delivery the fuel may have a higher sulfur content because the hull of the barge in which the fuel is transported will not be cleaned out. Shell acknowledged this fact in its Kulluk application materials. Region 10 should explain whether the impacts of transport of the ultra-low sulfur fuel to the North Slope were considered in the modeling and the permit conditions, since it more likely than not will result in the use of higher sulfur fuel.⁷³ If the addition of sulfur during transport was not accounted for in the *Discoverer* permits, please ensure that the appropriate steps are taken to address this issue.

G. We Have Significant Concerns with the Ambient Air Quality Modeling Analysis Conducted for Shell’s Revised Permits.

We note “that Shell submitted a single analysis for operation in both the Beaufort and Chukchi Seas, using the Associated Fleet to be authorized under the Beaufort 2011 Revised Draft Permit”⁷⁴ According to the record for the revised permits, the vessels used in the Beaufort and Chukchi operations are different.⁷⁵ Please verify that the use of the Associated Fleet for the Beaufort is sufficient to capture the impacts from the fleet in the Chukchi where higher air quality impacts are predicted to occur.

We also ask Region 10 to justify the use of just one meteorological data set as the “representative meteorological data” in the modeling. One of the purported benefits of using AERMOD is the ability to use “representative meteorological data” in the modeling.⁷⁶ However, “Shell submitted a single analysis for operation in both the Beaufort and Chukchi Seas.”⁷⁷ Is the meteorological data that was used the most conservative? If not, why and how was the meteorological data chosen? Based on information available about the Weather Research Forecast (WRF) data used by Shell, information was collected from separate buoys and stations

⁷¹ EPA, Draft Beaufort Permit at 29;

⁷² EPA, Draft Beaufort Permit at 27;

⁷³ Shell, Kulluk Supplemental Report at 25 (Feb. 28, 2011) (requesting “a permissible test limit of 100 ppm sulfur in the fuel consumed by the *Kulluk* and associated fleet.”).

⁷⁴ EPA, Revised Stmt. of Basis at 39.

⁷⁵ See 2011-06-02 email (noting “changes from the Beaufort inventory are the removal of the Tug/skimmer (PBT-1 – 4 and AEB-1 - 4) and the third work boat is decreased from a Rozema to a Kvichak”).

⁷⁶ EPA, Revised Stmt. of Basis at 39.

⁷⁷ EPA, Revised Stmt. of Basis at 39.

in the Beaufort and Chukchi Seas.⁷⁸ More importantly ice formation appears to play a significant role in wind and weather patterns⁷⁹ and because ice varies between the two oceans it is critical that a further justification of the meteorological data is provided for these permits.

1. Use of AERMOD-COARE.

EPA is soliciting comments on the use of the non-guideline AERMOD-COARE model in these proposed revised permits.⁸⁰ The new COARE model is highly involved and it would take more time than is being provided to review the details of the model and be able to provide technical comments and broader peer review. The use of a new modeling approach should be reason enough for EPA to provide for more time to complete a comprehensive review of the modeling.

In general, we question whether the performance evaluations used to assess the model are representative. In looking at the results from the three tracer sites (Pismo Beach, Cameron, and Carpinteria), there is significant variation in model performance. If there is that much difference between these “similar” California and Louisiana sites, it stands to reason that conditions in the Arctic may be a lot different.

Differences in sea surface temperature, depth of the marine layer, sea surface roughness, among other things, could give substantially different results in an arctic environment, particularly with respect to the 1-hour NO₂ NAAQS. Based on the results of the performance evaluation presented in the Model Clearinghouse review,⁸¹ there is a clear need for additional tracer experiments off the North Slope. Because this is the first time using this non-guideline modeling approach in the Arctic we believe it is reasonable for EPA to require Shell to conduct these needed tracer tests before a final permit is issued.

At a minimum, EPA must include a permit condition that requires Shell to collect data for use in evaluating the performance of the AERMOD-COARE model. This, at least, would help provide a data set for the future. In fact, the EPA Model Clearinghouse recommended further investigation to “determine if other tracer gas experiments are available to evaluate AERMOD-COARE, especially for Arctic conditions.”⁸²

It is unclear from the permit record files whether Shell tuned the COARE model with the available data sets and then used the same tuned model in the performance evaluation. EPA must ensure, and make it known to the public, that Shell tested the model with an independent data set. There is very little discussion of performance goals in the modeling evaluation so it is difficult to assess the model performance presented by EPA. In general, the goal must be to

⁷⁸ Compare <http://knik.iarc.uaf.edu/buoy09/> with <http://knik.iarc.uaf.edu/buoy/> (Attachment 3). See also <http://mms-meso.gi.alaska.edu/obs.html> (Attachment 4).

⁷⁹ See <http://mms-meso.gi.alaska.edu/pub/amss10-jzhang-poster.pdf> and <http://mms-meso.gi.alaska.edu/pub/amss10-jzhang-abstract.pdf>

⁸⁰ EPA, Revised Stmt. of Basis at 50.

⁸¹ EPA Memo, May 6, 2011, Model Clearinghouse Review of AERMOD-COARE as an Alternative Model for Application in an Arctic Marine Ice Free Environment

⁸² EPA Memo, May 6, 2011, Model Clearinghouse Review of AERMOD-COARE as an Alternative Model for Application in an Arctic Marine Ice Free Environment, p. 12.

select the best performing model that does not under-predict impacts. From a scientific perspective, the use of AERMOD-COARE is far superior to the OCS model, however that does not necessarily mean it is accurate in this particular application. EPA must make it clear, from the outset, what the acceptable performance results must be, based on the available data – *e.g.*, is it good enough to get within a factor of two or are the data good enough to demand results within 30 percent. EPA must be able to clearly demonstrate that the model is accurately predicting impacts to a reasonable degree and that the model is not under-predicting impacts.

The AERMOD-COARE model does not account for platform building downwash or shoreline fumigation. While there are no platforms planned for the proposed development, the permit should explicitly prohibit their use. If AERMOD-COARE is used in an application with platform drilling then EPA would need to evaluate more closely the need to simulate cavity effects next to the platform. Regarding shoreline fumigation, it is not clear whether those conditions were included in any of the tracer data sets. Shoreline fumigation can cause higher short-term concentrations, but according to Shell’s modeling analysis, the distance to the lease blocks is great enough that the highest concentrations would likely occur over water. Assuming this is true, even in the Beaufort Sea where lease blocks are much closer to shore, we would be concerned with the use of AERMOD-COARE in situations where high concentrations are predicted closer to shoreline.

2. NO₂/NO_x ratios.

The Plume Volume Molar Ratio Method (PVMRM) algorithm used in the ambient analysis to determine the atmospheric conversion of NO_x to NO₂ requires estimates of in-stack ratios of NO₂/NO_x. These in-stack ratios appear to be important parameters in the modeling, and therefore EPA must ensure the ratios used are protective of the NAAQS since small changes to the ratios used could have a significant impact on modeled concentrations.⁸³ This is especially important given the fact that Shell is requesting approval for the least-conservative options for modeling 1-hour NO₂ impacts (*i.e.*, using the non-regulatory-default PRVVRM option – a Tier 3 application under Section 5.2.4, App W that requires Regional approval – and pairing NO₂ data in time (*see* comments on *Use of Paired Data*, below)).

The proposed revised permits are based on the use of generic NO₂/NO_x ratios, instead of ratios based on actual source testing.⁸⁴ It appears that the generic ratios are higher for all but the MLC and HPU engines, the resupply ship, skimmer and workboats.⁸⁵ However, a closer look at the actual source test data shows that the equipment-specific ratios that were compared to the generic ratios are based on averages at high loads only and miss higher values. For example, for cementing and logging units, test data show the following:

⁸³ See 4/29/11 Shell modeling submittal (“Alternate_NO2_Modeling_Disco_04_29_2011.pdf”).

⁸⁴ Ambient Air Quality Analysis at 22.

⁸⁵ 4/29/11 modeling submittal (“Alternate_NO2_Modeling_Disco_04_29_2011.pdf”), Tables 1 and 2 at 3 and 4.

Table 3: Measured NO₂/NO_x Ratios for Discoverer Sources⁸⁶

Unit	Load [%]	Ratio [%]
Cementing unit FD-16	100	20.15
Cementing unit FD-16	70	26.71
Cementing unit FD-17	100	5.51
Cementing unit FD-17	70	18.68
Logging winch FD-19	80	16.73
Logging winch FD-19	80 (Average)	18.11
Logging winch FD-19	50	16.69
Logging winch FD-19	50 (Average)	12.09
Average at high load (90-100%)		12.8
Average at medium load (60-90%)		18.17
Modeled Value		17.6

The average ratio calculated from this data set for comparison with the generic ratio (that was used in the modeling) was 12.8 percent, which appears to be the average of all measured ratios occurring at high loads (*i.e.*, at 90-100%). The generic ratio used in the modeling for these units is 17.6 percent. With the highest measured value of 26.7 percent occurring at 70 percent load and the average of all measured ratios occurring at this medium load range (*i.e.*, at 50-80%) of 18.17 percent, it would seem that the equipment-specific ratios are, in fact, higher than the generic ratio used in the modeling.

For icebreakers, the equipment-specific ratio presented in Shell's analysis is 6.7 percent, compared with a generic ratio of 17.6 percent. However, the highest ratios from the test data, again, are from equipment operating at 50-60% load with an average ratio of 18.87 percent.

Given the significance of this parameter in the modeling, it is essential that EPA ensure the most protective values are used. We suggest that EPA perform a comprehensive review of the measured test data submitted by Shell and calculate average ratio values at the highest loads. For the cases where the equipment-specific ratios are higher than the generic ratios, EPA should require the use of these higher source-specific values as inputs for to the PVMRM modeling algorithm.

3. Use of paired data.

We strongly support EPA's decision not to allow a PM_{2.5} modeling analysis that pairs modeled data with monitored data (in time) to determine compliance with the NAAQS. In the past, EPA has said, that pairing data does not ensure protection of the air quality standards. As an example, EPA Region 8 made the following statement regarding this issue:

The EPA's recommended procedure for modeling impacts from increment consuming sources is to acquire emissions data from the most recent 2 consecutive years, in order to characterize the full range of typical emissions patterns, and 5 years of meteorology data, in order to account for variability in weather patterns from year-to-year. As you know,

⁸⁶ From Discoverer_NO2_SO2_Impact_Modeling_using_AERMOD_3_18_11_R.pdf, Attachment E.

the purpose of the increment modeling is to use these inputs to identify whether an increment violation is likely to occur in the future under realistic emissions and meteorology conditions. In contrast, the use of CEM data paired with corresponding, or same hour, meteorological data would only serve to document whether an increment violation took place over the period of time being modeled, not to realistically assess whether violations are likely under expected emissions and weather conditions over time. For this reason, we have no objection to your use of CEM data to determine a single emissions value that represents actual emissions patterns for each source, but we believe that you should use two consecutive years of CEM data to determine the maximum, or near maximum, emission rate, just as you would if you were using permitted potential emissions. That single emissions value for each source would then be modeled over 5 years of meteorological data to identify expected increment violations under realistic conditions.⁸⁷

While the context of EPA's position in the above case is for increment modeling, a modeling analysis for permit compliance with the NAAQS is equally relevant in the sense that the modeling for NAAQS protection is needed in order to ensure that a violation *will not occur in the future*, not simply to determine that a violation occurred over the period of time modeled. And even in recently allowing limited, case-by-case situations where paired data can be modeled to demonstrate compliance with the 1-hour NO₂ NAAQS, EPA is admitting that this type of analysis results in "a less conservative" estimate of impacts.⁸⁸

While we support EPA's decision not to allow pairing of NO₂ data as Shell originally proposed (*i.e.*, hour-by-hour pairing of modeled concentrations with background concentrations), we do not agree that the diurnal pairing of the 2-year average of the 98th percentile NO₂ concentrations by hour (based on the number of samples) between July 1 and November 30 with corresponding modeled concentrations for that hour is protective enough of the NAAQS. We feel a more protective approach would be to use the 98th percentile of the annual distribution of daily maximum 1-hour average values averaged across the 2-year meteorological data period used in the dispersion modeling. Given the fact that the predicted 1-hour average NO₂ "maximum" modeled impact in the Chukchi Sea is very close to the standard (93% of the NAAQS), EPA must make sure that Shell is not under-predicting impacts. The use of diurnal pairing results in a less conservative analysis and, given that the modeling shows impacts very close to the NAAQS, this approach does not seem warranted.

4. Emissions cannot both be calculated on a rolling basis and averaged over a year.

In the revised Statement of Basis, Region 10 notes that:

Shell prorated the period averages in order to estimate the annual average impacts. For example, to estimate the annual average NO₂, PM_{2.5} or SO₂ impacts, Shell multiplied the 120-day average impact by 0.329 (120 drilling days

⁸⁷ December 10, 2001 letter from EPA Region 8 to North Dakota Department of Health.

⁸⁸ March 1, 2011 EPA Memo Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO₂ National Ambient Air Quality Standard.

out of 365 days in a year). Shell's approach for estimating the annual average impact is reasonable since there are no impacts during non-drilling periods.⁸⁹

We disagree that period averages can be prorated. This is particularly true for pollutants such as NO₂ that have rolling 12-month emissions limits. The permit cannot rely upon a 12-month period in which to demonstrate compliance with air quality standards and at the same time prorate those very same emissions. Please update the permit analysis so that the impacts for NO₂, PM_{2.5}, and SO₂ are not prorated and then update any relevant permit conditions as necessary to ensure compliance with relevant standards.

5. Determining compliance with the PM_{2.5} NAAQS.

Compliance with the 24-hour average PM_{2.5} NAAQS must be demonstrated using the maximum modeled 24-hour average concentration.⁹⁰ This maximum modeled concentration must be added to the 98th percentile monitored background concentration and compared with the NAAQS. Shell's ambient air quality analysis uses the "98th percentile values consistent with the form of the NAAQS" in combination with the 98th percentile values from the monitoring record to determine compliance with the NAAQS, resulting in a less conservative analysis that does not assure compliance with the standard.⁹¹

According to EPA's recent guidance on demonstrating compliance with the PM_{2.5} NAAQS, "[c]ombining the 98th percentile monitored value with the 98th percentile modeled concentrations for a cumulative impact assessment would result in a value that is below the 98th percentile of the combined cumulative distribution and would therefore not be protective of the NAAQS."⁹² The EPA Model Clearinghouse specifically recommends the use of "the average of the 1st highest modeled 24-hour impacts over 5 years as the modeled contribution to the cumulative NAAQS compliance analysis."⁹³ EPA must ensure that the PM_{2.5} NAAQS is fully protected by using the maximum modeled concentration, as specified by the Model Clearinghouse.

⁸⁹ EPA, Revised Stmt. of Basis at 42.

⁹⁰ 2/26/10 EPA Guidance Memo "Model Clearinghouse Review of Modeling Procedures for Demonstrating Compliance with the PM_{2.5} NAAQS."

⁹¹ Ambient Air Quality Impact Analysis at 31 Tables 12 and 13, Footnote 1 indicates modeled impacts are from Tables 3 and 4 in Shell Technical Memorandum "AERMOD AIR QUALITY IMPACT ANALYSIS OF NO₂, SO₂, PM_{2.5}, PM₁₀, CO, AND NH₃ – DISCOVERER DRILLSHIP, SUPPLEMENT TO MARCH 18 AND APRIL 29, 2011, AERMOD IMPACT REPORTS" Dated May 19, 2011. Tables 3 and 4, Footnote 1, pp. 15-16 of this referenced document indicates that values presented in the tables are, "[f]or 1-hour NO₂ and 24-hour PM_{2.5}, the 98th percentile values consistent with the form of the NAAQS are presented."

⁹² 2/26/10 EPA Guidance Memo "Model Clearinghouse Review of Modeling Procedures for Demonstrating Compliance with the PM_{2.5} NAAQS."

⁹³ *Id.* at 2.

6. Background concentrations.

In general, we support the use of PM₁₀ and PM_{2.5} data from Wainwright for use in determining background concentrations for the Chukchi Sea. To ensure an outcome that is most reflective of conditions in the Chukchi, we believe EPA should consider the use of the Point Lay data as representative NO₂ background concentrations in order to ensure better protection of the NAAQS. Region 10 justifies its reliance solely upon the Wainwright data by stating that the:

Wainwright monitoring sites are the most representative of background at the Chukchi Sea lease blocks because they (1) are closer to the Shell lease blocks than the Point Lay site, (2) have a more robust data set with 2 years of available data for most pollutants, and (3) they generally have lower values, which are more representative of the expected offshore concentrations.⁹⁴

We are most concerned with the third point given the fact that the NO₂ modeling conducted for these permits is already not the most conservative analysis, as noted in our comments on NO₂/NO_x ratios and paired data, above. Therefore, it would seem prudent to choose the most conservative data set to use for background concentrations, especially if it will be paired in time with modeled concentrations.

We also question EPA's decision to use the lowest available PM_{2.5} background concentration for the Beaufort Sea impact analysis (*i.e.*, based on data collected at the Badami monitoring site). This is especially concerning since EPA has proposed the use of the much higher PM_{2.5} data from the Deadhorse monitoring site for the Kulluk permit impact analysis. Specifically, EPA indicates that "[t]he Deadhorse PM_{2.5} data set is being utilized for the Shell Kulluk permit application as it is in closer proximity to Kulluk lease blocks in the Kulluk application and is more likely to account for both primary and secondary PM_{2.5} impacts."⁹⁵

Given that Deadhorse is: (1) the chosen site of the co-located PM_{2.5} monitor; (2) the site with the longest-running data set; (3) the site with the most current available data; and (4) the data set that better accounts for secondary PM_{2.5} formation, EPA must use the PM_{2.5} data from this site in determining compliance with the PM_{2.5} standard for the *Discoverer* operations in the Beaufort Sea. In the secondary PM_{2.5} assessment, EPA relies heavily on the fact that the monitored background concentrations used in the impact analyses include the impacts of secondary PM_{2.5} from onshore sources.⁹⁶ The Deadhorse data clearly better support this position and must be used as representative background concentrations for PM_{2.5} if EPA is going to skip conducting a quantitative assessment of secondary PM_{2.5} impacts. Table 4 shows the difference in projected PM_{2.5} impacts when using data from Deadhorse instead of Badami and when using maximum modeled concentrations instead of 98th percentile concentrations.

⁹⁴ Air Quality Impact Analysis at 19.

⁹⁵ EPA Memo, "EPA Region 10 Determination of Appropriate Background Values for the Chukchi Sea and Beaufort Sea OCS Permits" (June 23, 2011).

⁹⁶ Ambient Air Quality Analysis at 28.

Table 4: Comparison of 24-hr PM_{2.5} Impacts With Different Background Concentrations

	Modeled Impact¹ [µg/m³]	Background Concentration [µg/m³]	Total Impact [µg/m³]	24-hr NAAQS [µg/m³]	Total Impact as a % of NAAQS
Badami	18.2 ²	6	24.2	35	69
Deadhorse	18.2 ²	17	35.2 ³	35	101

¹ Ambient Air Quality Impact Analysis, Table 12 at 31.

² Note: Modeled impacts should be the maximum modeled concentration, not the 98th percentile concentration. The 18.2 µg/m³ concentration in the Beaufort Sea is discussed in the secondary PM_{2.5} analysis (Ambient Air Quality Analysis at 28).

³ This represents a 45% increase in total PM_{2.5} impacts from the *Discoverer* operations when assessed along with the best estimate for primary and secondary PM_{2.5} background concentrations in the area.

Using the maximum modeled concentration and the higher background concentration from Deadhorse indicates that Shell’s operations may, in fact, threaten compliance with the 24-hour PM_{2.5} NAAQS.

With respect to the data used for NO₂ and SO₂, the “background value” Region 10 is using “is the highest calendar year average from the relevant monitoring site.”⁹⁷ For other pollutants, Region 10 selected “the highest value for either of the possible 5-month drill seasons at the appropriate monitoring sites.”⁹⁸ At bare minimum, we request that Region 10 use the highest average for the relevant 5-month drilling season (instead of the entire year) and prefer that the agency select the highest value from the drilling season.

7. Cumulative impact assessment.

We have significant concerns that the air quality analysis relied upon by Region 10 does not account for the potentially significant contribution of pollutants from vessels/mobile sources that will operate in the same vicinity as the OCS Source and Associated Fleet. In particular, it appears that the air quality analysis relied upon by Region 10 in no way accounts for emissions from the *Discoverer* (including its main propulsion engine), the Icebreakers/Anchor Handlers, or the any of the other Associated Fleet before the *Discoverer* is determined to be an OCS Source.

First, it is clear that emissions from mobile sources connected with the drilling operation are not represented in the existing background air quality data. Given that no prior drilling operations have been conducted in the last several years, the background data was clearly collected at times when those mobile sources were not operating.

Second, it appears that the modeling conducted by Shell and Region 10 also fails to account for the emissions from nearby mobile sources. Shell appears to have modeled three different activity sets to simulate drilling four wells over a period of 20 days. These three different scenarios cover: 1) MLC drilling; 2) well drilling; and 3) logging and cementing and other casing work. Our understanding of the modeling work is that all of these scenarios model

⁹⁷ EPA, Revised Smt. of Basis at 48.

⁹⁸ EPA, Revised Smt. of Basis at 48.

emissions only from the OCS Source and Associated Fleet and no other mobile sources are included.

We are therefore concerned that the modeling relied upon by Region 10 fails to account for a potentially significant source of pollution, which may result in inaccurate predictions of impacts to air quality. We ask that EPA clarify whether and how the air quality analysis incorporates the potential emissions from mobile sources related to the drilling program that are not captured in the PTE calculations for the OCS Source and Associated Fleet. We are concerned both with respect to the impacts on short-term standards, including the 1-hour NO_x, but also the annual air quality standards.

As discussed further below, we also ask that Region 10 undertake a regional ozone air quality analysis. The agency currently has before it four draft OCS air permits for an area that already has high levels of ozone. It is essential that the cumulative impacts of the emissions of NO_x and VOCs in this area are addressed now before the draft permits are finalized and issued.

8. The need for additional information on ozone and for compliance with the new 8-hour NAAQS for ozone.

Additional information is required for these permits regarding ozone. As EPA has described, ground-level ozone is:

created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC. Breathing ozone, a primary component of smog, can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level ozone also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue.⁹⁹

We are disappointed that no effort has been made to undertake regional modeling of ozone formation, particularly in light of the fact that Region 10 currently has four air permits for the Arctic pending before it.¹⁰⁰ This issue requires further analysis by Region 10 beyond the existing justification that:

the fact that there are no other stationary sources in the more immediate regional vicinity of Shell's operations in the Chukchi Sea that contribute ozone precursors to the airshed, and the levels of the maximum 1-hour and 8-hour ozone levels measured on the North Slope, Region 10 concluded that the contribution of the

⁹⁹ EPA, Basic Information on Ozone.

¹⁰⁰ EPA, Revised Stmt. of Basis at 39 ("Shell therefore used AERMOD with representative meteorological data in its supplemental analysis for purposes of evaluating the impact of the project emissions for all applicable pollutants *except for ozone and secondary formation of PM2.5*. As explained below, non-modeling assessments and analysis were used to evaluate ozone and secondary formation of PM2.5." (emphasis added)).

ozone precursor emissions from Shell's exploration operations to the formation of ozone in the region was expected to be small and that emissions from Shell's exploration operations would not cause or contribute to a violation of the NAAQS for ozone.¹⁰¹

This justification fails to explain why ozone was not modeled in the Beaufort where other existing sources contribute ozone precursors.¹⁰² Indeed, in the previous permitting process EPA recognized "point sources in the North Slope oil and gas fields near Deadhorse contribute approximately 41,000 tpy of NOX and 1,100 tpy of VOC."¹⁰³ Additionally, research conducted on air quality in Nuiqsut (in light of the pollution generated by Alpine Oil Field and Prudhoe Bay) showed elevated ozone levels in the winter months.¹⁰⁴

Second, turning back to the Chukchi, this statement fails to account for ConocoPhillips' operations for which Region 10 just issued a draft Title V permit. Region 10's statement of basis for that permit reflects that ConocoPhillips will emit 207.2 tons per year of NOx and 25.1 tons per year of VOCs after permit limits are taken into account.¹⁰⁵ Without these limits, the emissions are 1,948.5 of NOx and 64.1 of VOCs.¹⁰⁶ While these emissions will not occur in the air shed until 2013, they nevertheless will be present and should be considered by the agency.

Additionally, as Region 10 previously recognized:

Over the past ten years, there have been monitoring programs that measured ozone and ozone precursors (i.e., NOX and VOC) in the North Slope where oil and gas operations are currently located. The ozone measurement programs include Barrow (2003 - 2005), BPX-Badami (1999), BPX-Prudhoe Bay (2006 - 2007), CPAI-Alpine (Nov 2004 - Dec 2005) and CPAI-Kuparuk River (Jun 2001 - June 2002). Measurements from these six sites indicate that the highest 1-hour concentration was 73 parts per billion (ppb) while the highest 8-hour measurement was 50 ppb.¹⁰⁷

Why was this information not updated within the revised Statement of Basis? Permittees are required to conduct preconstruction monitoring for NO₂ and VOCs emissions over 100 tpy. Acknowledging the previous data on background levels of ozone, can Region 10 still reasonably conclude that "no further evaluation is needed for the ozone standard"?

This question is particularly salient in light of EPA's decision to revise the 8-hour standard.¹⁰⁸ The agency expects to adopt a new primary 8-hour standard of between 0.060-0.070

¹⁰¹ EPA, Revised Stmt. of Basis at 57.

¹⁰² Information in the record, indicates that options are available for this information. See 2011-04-17 Email ("If permit application is divided in intervals based on blocks, the second year of O3 data could potentially be made available for 2009 and 2010 averaging of impacts").

¹⁰³ EPA, Stmt. of Basis Original Beaufort Permit at 126.

¹⁰⁴ Fish, C. Air Quality Work in Alaska Native Villages (Attachment 5).

¹⁰⁵ EPA, Stmt. of Basis for ConocoPhillips Permit at 26.

¹⁰⁶ EPA, Stmt. of Basis for ConocoPhillips Permit at 26.

¹⁰⁷ EPA, Stmt. of Basis Original Beaufort Permit at 126.

¹⁰⁸ 75 Fed. Reg. 2938 (Jan. 19, 2010).

parts per million (ppm) this summer.¹⁰⁹ The existing 8-hour standard is 0.075 ppm. We ask Region 10 to ensure compliance with the new 8-hour standard for ozone for several reasons. First, as just discussed, current background concentrations of ozone are already as high as 0.050 ppm (8-hour average) on the North Slope.¹¹⁰ Therefore, the formation of additional ozone as a result of offshore oil and gas operations could take the North Slope out of attainment. Second, the new 8-hour standard is an important health based standard and this standard should be the one that Shell seeks to comply with in its proposed years of future operations in the Beaufort and Chukchi Seas. Indeed, because the proposed air permits are not time limited, they further support the need for compliance with the most recent legal requirements. Additionally, both BOEMRE and Shell rely upon the NAAQS to mitigate the impacts of the air emissions associated with Shell's exploration plans on air quality, marine mammals, and other resources.¹¹¹ Therefore, it is particularly critical that compliance with these emerging standards is ensured.

9. Further consideration of the secondary formation of PM_{2.5} is required for the permits.

EPA presents a qualitative assessment of secondary PM_{2.5} impacts instead of actual modeling in response to the EAB's conclusion that there was not adequate support in the record for EPA's determination that the *Discoverer* will not emit significant quantities of PM_{2.5} precursors.¹¹² EPA determined that a quantitative photochemical modeling analysis was not needed to assess secondary PM_{2.5} impacts. However, in making this decision EPA relies heavily on the fact that the monitored background concentrations used in the impact analysis include the impacts of secondary PM_{2.5} from onshore sources.¹¹³ As previously noted, EPA is not in fact using the PM_{2.5} background concentrations in the Beaufort Sea that best accounts for secondary PM_{2.5} formation. EPA must use PM_{2.5} background concentrations from Deadhorse, instead of Badami, to better account for secondary PM_{2.5} impacts. Additionally, we encourage EPA to work with Nuiqsut to obtain the data on air quality collected there that shows elevated particulate matter in the summer.¹¹⁴ Please explain why the secondary formation of PM_{2.5} modeling that was performed was not relied upon by the agency and what the modeling results showed.¹¹⁵

EPA is also relying on what it determined is a "significant margin of safety" in the PM_{2.5} NAAQS compliance demonstration.¹¹⁶ Again, if the higher background concentrations from Deadhorse are used as more representative of both primary and secondary PM_{2.5} concentrations, then the margin of safety referred to by EPA is completely eliminated, allowing for no contribution from secondary PM_{2.5} emissions from the *Discoverer* and the Associated Fleet at the locations of maximum impact before the NAAQS would be threatened (see Table 4, which

¹⁰⁹ (<http://www.epa.gov/air/ozonepollution/pdfs/20100106present.pdf>).

¹¹⁰ EPA, Stmt. of Basis Original Beaufort Permit at 126.

¹¹¹ See, e.g., Shell, EIA for Camden Bay Exploration Plan at 4-12, 4-55.

¹¹² EAB, Remand Order at 14-19.

¹¹³ Ambient Air Quality Analysis at 28.

¹¹⁴ Fish, C. Air Quality Work in Alaska Native Villages at 13 (Attachment 2).

¹¹⁵ See 2011-04-17 email (noting that secondary PM_{2.5} formation modeling was done and that CALPUFF results were provided to EPA).

¹¹⁶ Ambient Air Quality Analysis at 29.

shows an impact of 101% of the NAAQS). It does not appear that the qualitative secondary PM_{2.5} analysis presented by EPA is sufficient to assure protection of the NAAQS.¹¹⁷

10. The need for compliance with the new PM_{2.5} increment.

On October 20, 2010, EPA adopted a final regulation establishing new PSD increments for PM_{2.5} that went into effect on December 20, 2010.¹¹⁸ As the final regulation explains:

[f]ine PM is derived directly from combustion material that has volatilized and then condensed to form primary PM or from precursor gases, such as SO₂ and NO_x, reacting in the atmosphere to form secondary PM . . . Primary and secondary fine particles have long lifetimes in the atmosphere (days to weeks) and travel long distances (hundreds to thousands of kilometers).¹¹⁹

The new increments go into effect on October 20, 2011,¹²⁰ and are:

Table 5: New PM_{2.5} Increments¹²¹

	NAAQS	Class 1	Class 2	Class 3
Annual	15	1 µg/m ³	4 µg/m ³	8 µg/m ³
24-hour	35	2 µg/m ³	9 µg/m ³	18 µg/m ³

We ask that EPA require Shell to demonstrate compliance with the new PM_{2.5} increment because the regulation will be effective *before* Shell’s operations begin. Shell should demonstrate compliance with all requirements that are effective during its period of operation. The Major Source Baseline Date for EPA’s recently finalized PM_{2.5} increments is October 20, 2010. After this date, any new major source of air pollution consumes the increment that was established by EPA in its October 20, 2010 final rule.¹²² Specifically, EPA is:

requiring each source that receives its PSD permit *after the effective date of the PM_{2.5} increments, regardless of when the application was submitted*, to provide a demonstration that the source’s proposed emissions increase, along with other increment-consuming emissions, will not cause or contribute to a violation of the PM_{2.5} increments.¹²³
[emphasis added]

Further:

sources applying for a PSD permit under the Federal PSD program after the major source baseline date for PM_{2.5} (i.e., after the date of publication of this final rule), but before the PM_{2.5} increments become effective (i.e., the date 1 year after publication of this final

¹¹⁷ As discussed previously in our comments, modeling for secondary PM_{2.5} formation is practical.

¹¹⁸ 75 Fed. Reg. 64863-64907 (Oct. 20, 2010); 72 Fed. Reg. 54,112 (Sept. 21, 2007).

¹¹⁹ 75 Fed. Reg. at 64880.

¹²⁰ 75 Fed. Reg. at 64,865.

¹²¹ 75 Fed. Reg. at 64,871.

¹²² 75 Fed Reg 64863, Oct 20, 2010, effective Dec 20, 2010.

¹²³ 75 Fed Reg 64899, Oct 20, 2010.

rule), will be considered to consume PM_{2.5} increment. While EPA will not require any such source to include a PM_{2.5} increment analysis as part of its initial PSD application, *an increment analysis ultimately will be required before the permit may be issued if the date of issuance will occur after the trigger date*, when the PM_{2.5} increments become effective under the Federal PSD program.¹²⁴

The administrative record for the revised permits indicates that the EPA is planning to issue the final revised permits in September 2011. This is based on a schedule with a public comment period that ends on August 1, 2011.¹²⁵ The public comment period for the revised permits is now scheduled to end on August 5 and there are no guarantees that EPA will be able to thoroughly respond to the public comments in time to issue final permits before the date that the PM_{2.5} increments take effect on October 20, 2011.

From the administrative record it is also apparent that there was a conference call regarding the PM_{2.5} increment in June 2011 but no details on the substance of the call is available as part of the permit records. Elsewhere in the record shows that Shell inquired about the need to demonstrate compliance with the PM_{2.5} increments and EPA indicated an analysis was not needed.

It is short-sighted for EPA to proceed with the issuance of these permits when it is clear that the permitted operations will consume *more* than the available PM_{2.5} increment allowed in the already-finalized rule. The 24-hour average PM_{2.5} increment finalized by EPA is 9 µg/m³ and modeled 24-hour average PM_{2.5} concentrations are 12.4 µg/m³ (Chukchi Sea) and 12.2 µg/m³ (Beaufort Sea). Clearly, Shell has consumed more than the available increment and would not be able to demonstrate compliance with these increments if these permits were to be issued just a few weeks after the outlined schedule. Even if the permits are issued prior to the trigger date of the increments, we would like to see a demonstration that Shell will comply with the PM_{2.5} increments prior to commencement of operations.

H. The Need for a More Thorough Environmental Justice Analysis.

Although we appreciate that the EPA has conducted an analysis of compliance with the new 1-hour NO₂ NAAQS, which presents a significant concern for North Slope communities, we are still concerned that the revised Environmental Justice analysis omits consideration of important factors that may present a risk to human health, and, therefore a disproportionate risk to environmental justice communities on the North Slope. We are also concerned that the community participation process was lacking because our communities were not given adequate opportunity to enlist technical support and provide relevant comments on the critical issue of the appropriate model to be used in assessing impacts to air quality.

With respect to the air impacts of the proposed operations, it appears that Region 10 has once again relied on a demonstration of compliance with the NAAQS in order to assess whether

¹²⁴ *Id.* (emphasis added).

¹²⁵ 4/21/11 email from Doug Hardesty (EPA) to Susan Childs (EPA) regarding timeline for permit issuance, "2011-04-21c_Email_RE New Disco-Kulluk Schedules.pdf".

any adverse impacts would result for North Slope communities. As the EAB held in the prior appeal of the *Discoverer* permit:

While that analysis may, in part, rely on demonstrated compliance with applicable statutes and regulations, including compliance with the NAAQS standards in effect at the time of permit issuance that are indicative of adequate protection of public health, the permit issuer must endeavor to include and analyze in its environmental justice analysis available data that is germane to the environmental justice issue raised during the comment period.

In re Shell, Slip Op. at *79-80 n 87.

On the issue of potential impacts to the health of the Iñupiat, we again reiterate that the existing modeling of compliance with the NAAQS appears to exclude any potential impacts from mobile source emissions that occur before the *Discoverer* is deemed to be an OCS Source and/or take place more than 25 miles from the OCS Source. Those include, without limitation, emissions from the *Discoverer*'s main propulsion engines while moving to the drill site, the emissions of the anchor handler while setting the 8 anchors for the *Discoverer*, and the emissions from the fleet of support vessels, including icebreakers, before the *Discoverer* attaches to the first anchor. Although these are not deemed to be emissions from the OCS Source, for purposes of assessing potential adverse impacts to the health of the Iñupiat people, Region 10 must provide a rational basis for whether and how the OCS Source and the Associated Fleet emissions have been analyzed in combination with the mobile source emissions in assessing potential adverse health impacts to local communities, both onshore and in offshore areas used for subsistence purposes. At this point, we are concerned that the NAAQS analysis, in and of itself, does not account for the potential combined impacts of the stationary and mobile source emissions, which could be relevant considerations in assessing potential health impacts from short-term and long-term exposure to NO₂ as well as exposure to ozone, PM_{2.5}, and PM₁₀, among other pollutants.

We are also concerned that Region 10 appears to have again ignored a newly revised NAAQS in conducting its Environmental Justice analysis – this time the 8-hour standard for ozone. As we set forth earlier in these comments, EPA revised the 8-hour ozone standard because the prior standard did not adequately protect human health. The agency is well aware of existing data suggesting that existing levels of ozone on the North Slope are as high as .050 ppm (8-hour average), and the *Discoverer*'s operations will add to significant existing and planned sources of VOCs. As set forth by the EAB, Region 10 must not only consider compliance with the existing NAAQS, but must also include and analyze other data that is germane to the issue of potential disproportionate adverse health impacts. The Supplemental Statement of Basis as well as the supporting documents relating to the revised environmental justice analysis, to this point, have not accounted for additional, relevant information related to health threats posed by the potential formation of ozone.

We note in this regard that EPA Region 10 has failed to provide for any analysis of the impacts of ozone in analyzing environmental justice concerns in the Supplemental Statement of Basis. In the Supplemental Environmental Justice Analysis, Region 10 states the following:

With respect to ozone, given that ozone precursor emissions (NO_x and VOC) have decreased substantially in comparison to those permitted under the 2010 Permits, Region 10 continues to believe that emissions from the *Discoverer* and Associated Fleet will not cause or contribute to a violation of the ozone NAAQS for the reasons discussed in the Statement of Basis supporting the 2010 Permits.¹²⁶

By simply referring back to the analysis in the 2010 Supplemental Statement of Basis, the Region has repeated the same mistake made with respect to the short-term NO₂ NAAQS during the last permit cycle. This brief conclusory sentence does not in any way address the revised 8-hour ozone standard and whether Shell's emissions may cause or contribute to a violation of that revised standard, especially when considered in conjunction with mobile source emissions and other stationary sources on the OCS and onshore.

Furthermore, we caution EPA against relying on BOEMRE's evaluation of impacts to subsistence hunts. Our organizations have long critiqued the significance thresholds upon which MMS/BOEMRE relies in its National Environmental Policy Act (NEPA) analyses. The threshold for impacts to subsistence demonstrates a lack of appreciation of the importance of subsistence resources to our communities. The 2003 MMS FEIS, cited on page 20 of the Supp. EJ Analysis, marks the significance threshold for impacts to the subsistence-harvest pattern as: "One or more important subsistence resources would become unavailable, undesirable for use, or available only in greatly reduced numbers for a period of 1-2 years."¹²⁷ And significance threshold for sociocultural systems, according to MMS is "[c]hronic disruption of sociocultural systems occurs for a period of 2-5 years, with a tendency toward the displacement of existing social patterns."¹²⁸ All of these articulations are far beyond acceptable thresholds for deeming an impact "significant."

Finally, we reiterate that the limited public comment period presents serious environmental justice issues for North Slope communities. The EPA has specifically requested input into the new air quality model used for the first time in these permit proceedings. The modeling that went into that work obviously took many months, if not years, to prepare. Evaluation of that work requires an extremely high level of technical expertise, which is both time consuming and resource intensive. The agency's decision to allow no more than 30-days for recognized environmental-justice communities to review, analyze, and then provide comment on a brand new, technical modeling exercise impairs our communities' ability to adequately participate in the process. As a result, we are unable to submit comments on key aspects of the Environmental Justice analysis, namely whether the predicted impacts to air quality are accurate and defensible.

At a minimum, EPA should provide adequate time to obtain an independent technical review of the chosen modeling methodologies. EPA should have given advanced public notice of this important issue in order to allow for technical review and comment on the modeling.

¹²⁶ Supplemental Environmental Justice Analysis for proposed Outer Continental Shelf PSD Permit No. R10OCS/PSD-AK-2010-01 & Permit No. R10OCS/PSD-AK-09-01 at 20.

¹²⁷ MMS, FEIS at IV-4.

¹²⁸ MMS, FEIS at IV-4.