



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

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Seattle, WA 98101-3140

SEP 04 2009

OFFICE OF
AIR, WASTE AND TOXICS

Ms. Susan Childs
Regulatory Affairs Manager, Alaska Venture
Shell Offshore Inc.
3601 C Street, Suite 1314
Anchorage, Alaska 99503

Re: Incompleteness Determination for Outer Continental Shelf Pre-Construction Air Permit Application for the Frontier Discoverer Beaufort Sea Exploration Program.

Dear Ms. Childs:

On May 29, 2009, U.S. Environmental Protection Agency (EPA) Region 10 received Shell Offshore Inc.'s (SOI) Outer Continental Shelf (OCS) Pre-Construction Air Permit Application for the Frontier Discoverer Beaufort Sea Exploration Program in the Beaufort Sea. EPA conducted a partial completeness review of the May 29, 2009 permit application and determined that it was incomplete. EPA's July 29, 2009 partial incompleteness determination was based on a preliminary review of the section 2: Project Description and Emissions and section 3: Regulatory Applicability of the permit application. EPA's partial completeness determination did not include a review of information relating to the air quality modeling, air impact analyses and sections of the application relating to the emission control technology review.

On August 21, 2009 EPA received a fax of SOI's partial incompleteness letter¹ response. We have reviewed the response to determine if SOI has provided all the information requested in our July 29th letter. In addition, regional staff have reviewed the air quality modeling and air impact analyses of the Pre-Construction Air Permit Application for the Frontier Discoverer Beaufort Sea Exploration Program. EPA has not reviewed the emission control technology sections of the permit application. The information and data that SOI submitted to EPA as part of the Chukchi Sea OCS/ Prevention of Significant Deterioration (PSD) permit application that SOI wishes to be considered as part of the Beaufort Sea permit application should be submitted. EPA requests SOI update the Beaufort Sea application with the applicable Best Available Control Technology (BACT) determinations from the Chukchi Sea OCS/PSD permit application. We presume this will complete the emission control technology sections of the Beaufort Sea permit application.

Based on our review of SOI's partial incompleteness letter response and air quality modeling and air impact analyses sections of the permit application, we have determined that SOI's Pre-Construction Air Permit Application for the Frontier Discoverer Beaufort Sea Exploration Program is still incomplete. Pursuant to 40 CFR 124.3(c), we are listing below the information necessary to make these sections of the application complete. In addition,

¹ SOI's Partial Incompleteness Letter Response for the Frontier Discoverer Drill Vessel in the Beaufort Sea is dated August 21, 2009.

Attachment A includes a detailed list of technical comments on the modeling and monitoring sections. Additionally, we understand that SOI will be submitting revised emission data. Accordingly the emission data portion of the submission has not been fully reviewed.

Shell Offshore Inc. Partial Incompleteness Letter Response

1. SOI provided EPA with a list of Chukchi Sea permit application updates since February 23, 2009 that SOI intends to incorporate by reference into the Beaufort Sea permit application. Rather than this incorporation by reference approach, EPA requests that SOI submit a permit application for the Beaufort Sea that that is a standalone document. Incorporating by reference components of the Chukchi Sea permit application in the Beaufort Sea permit application will slow EPA's review of the application, complicate the public review process, and lead to possible errors in what EPA determines to be the full and complete Beaufort Sea permit application.

Please submit a revised application that includes the relevant portions of the information SOI submitted for the Frontier Discoverer Drill Vessel in Chukchi Sea. This includes the updated emission inventory and any associated updates to the BACT, modeling analyses, operation scenarios, requested restrictions, etc.

2. EPA requested SOI to provide an update to Table 2-2 to reflect the correct potential to emit (PTE) (tons per year) of the OCS source for all regulated new source review (NSR) pollutants in order to document which pollutants exceed the significant emission rates for purposes of determining PSD applicability. SOI stated that the emission rates in Table 2-2 of the Beaufort Sea permit application accurately reflect potential emissions from the OCS source however EPA's review of Table 2-2 indicates that it more correctly reflects the requested allowable or permitted emissions and not the PTE as defined in 40 CFR Part 55. The PTE of the OCS source should reflect the effect on emissions of any existing, legally enforceable requirements, but not the effect of the SOI requested restrictions. This is important because SOI has indicated that the requested restrictions are not intended to limit the source's potential to emit and hence are not Owner Requested Limits under 18 AAC 50.

Please update Table 2-2 to provide a correct summary of the PTE (tons per year) for all regulated NSR pollutants in order to document which pollutants exceed the significant emission rates for purposes of PSD applicability.

3. The application does not include a proposed allowable emission inventory for particulate matter (PM), which is also required to determine the BACT requirements for PM.

Please provide EPA with the inventory for PM, including the supporting calculations, in the same format as the other BACT pollutants.

4. SOI stated in their partial incompleteness letter that the Alaska Department of Conservation (ADEC) has the authority to require SOI to obtain a permit to comply with 18 AAC 50.080 – Ice Fog Standards. Given that EPA is implementing ADEC's rules within 25 miles of Alaska's seaward boundary, EPA, and not ADEC will make a determination if an ice fog issue exists. Until we have a complete application, EPA is unable to determine if an ice fog issue would exist and therefore has not made the determination under this rule. No additional information is needed at this time with regard to this provision.

Air Quality Modeling and Air Impact Analyses Incompleteness

5. SOI has stated that they will redo the modeling analysis based on recent discussions with EPA.

Please provide EPA with an updated modeling analysis that reflects the latest information on emissions, operating scenarios, background data, etc.

6. SOI has identified other operating scenarios that need to be analyzed and included in the application. Permit terms and conditions may be included to reflect modeling assumptions including source locations and operating schedules and scenarios. Therefore, the modeling inputs should reflect SOI's operational needs and intentions.

If secondary operating scenarios are envisioned, please submit descriptions and the associated air impact analyses in the application.

7. While the application included PM₁₀ background data, it is not clear whether conservative PM₁₀ measurements were used to determine compliance with the national ambient air quality standards (NAAQS). The location of the monitoring site and the time period of the data were not identified but EPA believes it is data from Badami that was collected in 1999. The application contained no justification that this data is still representative of, or a conservative estimate of, current air quality at the project location.

Please submit PM₁₀ background data that is representative of current air quality at the project location. If using existing data, include a justification that the data is either representative of current air quality or is a conservative estimate of current air quality.

8. The permit application contained PM_{2.5} background data that is not representative of current air quality levels at the project location and failed to meet data quality requirements as well as EPA's Quality Assurance/Quality Control requirements in Appendix A of 40 CFR Part 58. SOI used data from Wainwright which has not been demonstrated to be representative of, or a conservative estimate of, air quality in the Beaufort Sea project area. Wainwright PM_{2.5} measurements from

ATTACHMENT A
Air Quality Impact Analysis Comments to
Outer Continental Shelf Pre-Construction Air Permit Application
Frontier Discoverer Beaufort Sea Exploratory Drilling Program
Dated May, 2009

I. General Comments

- A. EPA understands that there are new operating scenarios and revised operating scenarios (e.g., bow ice washing, anchor handling, and ice breaker and oil spill response vessel replenishment). As part of the revised application,
1. Please include a table that lists and briefly summarizes **all** the primary and secondary operating scenarios.
 2. Please provide justification for performing either a quantitative or qualitative analysis of the emissions associated with each primary and secondary operative scenario.
 3. Please assimilate the new and revised analyses in the form of text, tables, figures and references into a revised application.
- B. If new or additional modeling is performed, please provide all input and output files on a CD or DVD as part of a revised application.
- C. EPA understands that SOI Offshore Inc. (SOI) started data collection on 15 August 2009 instead of June 2009 at the Badami monitoring station. The air pollutants being measured at the station include NO₂ and PM_{2.5}. Again, EPA request SOI to also measure PM₁₀ and O₃ at this station. Please note that EPA will adhere to the data representativeness criteria contained in the 1987 Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) and Section 8.2.2.c in Appendix W of 40 CFR Part 51, and the PSD significant monitoring levels specified in 40 CFR Part 52.21(i)(5)(i).
- D. Because of new information provided to EPA, certain sections in the SOI Beaufort Sea outer continental shelf (OCS) PSD application and the CD containing the supporting modeling files were not reviewed.
- E. Please indicate if the National Park Service was provided a copy of the original May, 2009 PSD application. Please include an additional copy of a revised application and EPA will forward that copy to the National Park Service.

Note: Permit conditions may be included to reflect any modeling assumptions such as source location, operating scenarios and schedules to ensure compliance with ambient air quality standards and air quality increments. Therefore, model inputs should reflect SOI's operational needs and intentions.

II. Specific Comments

A. Section 1, Introduction

Page 1 states the Frontier Discoverer will be conducting exploratory drilling operations within and beyond 25-miles from the Alaska seaward boundary of the Beaufort Sea.

1. Please identify the lease sale area(s) where the drilling will occur.
2. Please identify the specific lease blocks within each lease sale area where the drilling may occur. (Page 76 in the OCS PSD application indicates 64 lease blocks are considered for exploratory drilling.).
3. Please redo Figure 1-1 to show both the 3-mile boundary line and the 25-mile line from the seaward boundary.

B. Section 2, Project Description and Emissions

1. Page 5, fourth paragraph conveys that a helicopter will be used to transport workers from Deadhorse or Barrow to the drill ship every three to four weeks.
 - a. How many trips a day will the helicopter transport workers?
 - b. Will the helicopter be used for any other purpose and how frequently? Please be specific.
2. First line on page 14 states that the drill season is 168 days starting in July. Please confirm the beginning and ending dates of the drill season within a calendar year (i.e., 01 July to 31 December).
3. Page 18, second paragraph states that "...the ice management and anchor handling fleet would be either downwind of the Discoverer or beyond the 25-mile radius from the Discoverer..."
 - a. Please explain the downwind operations and duration of the ice management and anchor handling fleet and any changes to the maximum predicted concentrations and its locations that are used

to demonstrate compliance with ambient air quality standards and air quality increments. If these are secondary operating scenarios, please list them in the applicable table (see Comment I.A).

- b. Please confirm that there will be no more than the two vessels that compose the ice management and anchor handling fleet.
- c. The third paragraph on page 19 mentions bow ice washing of the Frontier Discoverer by the anchor handler vessel and this particular scenario was not modeled. Please provide a modeling analysis of this bow ice washing scenario.
- d. The first and second paragraphs on page 21 mentions anchor deployment and retrieval. Please provide a modeling analysis of this anchor handling scenario.
- e. SOI has recently conveyed that the ice management and anchor handling fleet, and the oil spill response vessel could have other operating scenarios not defined in the application. SOI is requested to:
 1. Identify and describe these secondary operating scenarios (see Comment I.A).
 2. Quantify the emission rates and list the source parameters of each of these scenarios.
 3. Provide a graphics showing the operating location of these scenarios relative to the Frontier Discoverer and the other vessels.
 4. Conduct a modeling analysis of these other secondary operating scenarios.
- f. Page 22 states that a tanker will be operating 25-miles beyond the Frontier Discoverer. EPA believes the tanker should be part of a growth analysis which warrants an assessment. Please identify the tanker in the operating scenario table (see Comment I.A), quantify the emissions of the tanker, and show the rates in the appropriate table. In addition, please conduct a quantitative or qualitative analysis of the tanker and provide justification for the selected analysis type.

C. Section 5, Ambient Impact Modeling

1. 40 CFR Part 50 does not list an annual standard for PM₁₀. SOI is requested to add a footnote at the bottom of Table 5-1 to reflect that there is no annual federal PM₁₀ standard.
2. In the first paragraph on page 62, SOI states that the ISC-Prime model is a U.S. EPA approved, steady-state, multiple-source Gaussian plume mode. In actuality, the ISC-Prime model is a non-guideline model requiring EPA approval prior to its use in air permit applications. SOI is requested to correct this erroneous statement in its revised application.
3. Third paragraph on page 64 indicates that the anchor handler/ice management will operate at virtual idle. Please explain what is meant by “described distance” and “virtual idle.”
4. Last sentence, second paragraph on page 65 implies that there is not a minimum distance from the Frontier Discoverer to the anchor handler/ice management and ice breaker vessels during ice breaking activities. Please discuss the consistency of this sentence with the first sentence in the same paragraph and how it affects the modeling results.
5. The oil spill response fleets consist of an offshore management/skimmer, three 34-foot work boats and one 47-foot Rozema skimmer (page 21). Further, it is mentioned on page 66, first paragraph that the Nanuq could be in the vicinity and will provide berthing for the oil spill response crew.
 - a. Please confirm that the emissions and stack parameters have been provided for these particular sources and these sources have been modeled as part of the compliance demonstration with ambient air quality standards and air quality increments.
 - b. If the Nanuq is not available, please discuss the berthing options and associated air quality impacts.
6. Page 69 provides a description of how the oil spill response fleet will be characterized for modeling purposes. EPA recommends that each vessel composing the oil spill response fleet have its own distinct volume source length rather than an average length of 50-meters.
7. Graphics of the modeling domain are provided in Figures 5-3 to 5-5.
 - a. Figures 5-3 to 5-5 are provided but not mentioned in the Section 5.5. Please clarify.

- b. Figure 5-5 shows a rectangle south of the Frontier Discoverer. Please identify this rectangle.
 - c. If additional modeling scenarios are analyzed such as those identified in Section II.B, please provide graphics of those domains if different from Figures 5-3 to 5-5.
8. Third paragraph on page 74 describes the locations of the associated fleets relative to the Frontier Discoverer for modeling purposes. Because the modeling is based on this operating configuration of the vessels, permit terms and conditions may be included to reflect modeling assumptions including source locations and operating schedules and scenarios. If this is unacceptable to SOI, please provide justification and any supporting modeling analyses demonstrating a permit condition is unnecessary.
9. Page 74, third paragraph states that the supply ship will be located 50-feet astern of the Frontier Discoverer. Please identify the method used to transfer supplies and fuel to the Frontier Discoverer.
10. EPA Region 10 issued a memorandum dated 02 July 2009 which discusses "Implementing PSD Baseline Dates, Baseline Areas, and Baseline Concentrations on the Outer Continental Shelf in Alaska." SOI is requested to address baseline dates, baseline areas, trigger dates, and baseline concentrations as it relates to the proposed project in a revised application that is consistent with the memorandum. A copy of the 02 July 2009 memorandum is attached.
11. Pages 76 to 80 (and Section 7) provide a discussion of the allowable and actual emission inventories used to address compliance with ambient air quality standards and air quality increments. Alan Schuler at the State of Alaska has provided EPA and ENVIRON (SOI's contractor) with his comments regarding the adequacy of the two inventories in a 26 August 2009 email (see attached email).
 - a. Please respond to Comment #1 in the email and identify and include emission rates from any major or minor source applications that have been deemed complete but a permit has not been issued by the State of Alaska in the two inventories.
 - b. Please identify and include any fugitive and area sources in the two inventories.
 - c. For Comment #4, EPA agrees with the State of Alaska that there is no justification to double annual impacts to obtain short term impacts. EPA requests SOI to redo the modeling for **all** air pollutants using the maximum hourly emission rates. Furthermore,

the assumptions and methodologies used in developing the hourly emission rates for each air pollutant should be documented and incorporated in a revised application. If short term emission rates are not available, please contact EPA and the State of Alaska to discuss possible options.

- d. Related to Comment #5, please describe how long term and short actual emission rates for each applicable air pollutant were derived in a revised application.
- e. As part of Comment #6, please discuss the source of the stack parameters if either the stack height, stack gas exit temperature, stack gas exit velocity, inside stack diameter and/or stack location were not available. This comment also applies to area and volume sources and their modeling parameters.
- f. Per Comment #8, please provide a description of the assumptions, methods and references used to develop the two inventories in the revised application.

D. Section 6, Background Concentrations

1. EPA agreed that SOI could use conservative background measurements to represent ambient air quality levels in the Beaufort Sea.
 - a. Please provide the source of the gaseous data and the period of record of the data as footnotes to Table 6-1.
 - b. Please provide verification and text that the BP Exploration Alaska, Inc. Liberty Development Project collected SO₂, NO₂ and CO data from 2007 and 2008 satisfy PSD data collection requirements including data quality.
 - c. Please discuss the representativeness of the BP Exploration Alaska, Inc. Liberty Development Project measurements in terms of conservatism and if there are any nearby sources that could contribute to the measurement levels.
2. The fourth paragraph on page 81 discusses PM₁₀ measurements from BPX in Prudhoe Bay with 24-hour concentrations as high as 55 micrograms per cubic meters. In the same paragraph, it states but fails to explain why this high 24-hour concentration was not used with SOI predicted impacts since the total impact is not expected to exceed the ambient air quality standards.

- a. Please explain why the 24-hour and annual PM_{10} data from Prudhoe Bay are not used as background since the data would be conservative.
- b. Please identify the source of the PM_{10} numbers appearing in Table 6-1.

(It should be noted that EPA has expressed concerns that the 1999 Badami PM_{10} data is unrepresentative because it is not current.)

3. The PSD preconstruction monitoring level for PM_{10} is 10 microgram per cubic meter for a 24-hour average. From Table 5-7 on page 75, the maximum predicted PM_{10} 24-hour concentration is 27.4 micrograms per cubic meter. This maximum predicted concentration exceeds the monitoring level and consequently, SOI should initiate PM_{10} data collection at the Badami monitoring station which restarted on 15 August 2009 to measure NO_2 and $PM_{2.5}$ background.
4. As early as April, 2008, EPA recommended that SOI start a preconstruction ambient air quality monitoring program for all criteria air pollutants consistent with the PSD regulation and guidance if they intended to propose projects in the Beaufort Sea OCS in the near future. EPA made the recommendation to SOI because of the lack of any current ambient air quality data including $PM_{2.5}$ that would be representative of the OCS and without knowing if a proposed project predicted concentrations would exceed PSD ambient monitoring thresholds. In addition, EPA informed SOI about our concerns that the 1999 measurements at Badami were not representative because they are not current.

SOI started a $PM_{2.5}$ (and NO_2) data collection program on 15 August 2009 (delayed from June, 2009) at the refurbished Badami monitoring station to represent air quality levels in the Beaufort Sea OCS. However, the minimum required four months of data will not be available until 15 December 2009. In lieu of waiting four months, SOI proposed the use of four months of $PM_{2.5}$ collected at the Wainwright monitoring station from November, 2008 to February, 2009. Nevertheless, EPA has determined this period of $PM_{2.5}$ data collected at Wainwright to be unacceptable because certain data quality requirements were not satisfied, arising from a problem with the instrumentation, which has since been fixed. $PM_{2.5}$ data collected after 5 March 2009 at Wainwright is meeting the data quality requirements.

Recently provided data from Wainwright shows nine 24-hour periods of $PM_{2.5}$ measurements equal to or greater than the 8.0 micrograms per cubic meter during the months of July and August, 2009, with the highest



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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1200 Sixth Avenue, Suite 900
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July 2, 2009

Reply To: AWT-107

MEMORANDUM

SUBJECT: Implementing PSD Baseline Dates, Baseline Areas, and
Baseline Concentrations on the Outer Continental Shelf in Alaska

FROM: David C. Bray
Senior Policy Advisor

TO: Rick Albright, Director
Office of Air, Waste, and Toxics

Janis Hastings, Associate Director
Office of Air, Waste, and Toxics

Introduction

The purpose of this memorandum is to clarify how EPA Region 10 intends to implement the PSD increments on the OCS in Alaska the absence of formal area designations under section 107(d).

Background

Pursuant to Section 328 of the Clean Air Act (Act) EPA has promulgated regulations to control air pollution from Outer Continental Shelf (OCS) sources to attain and maintain Federal and State ambient air quality standards and to comply with the provisions of Part C of title I (prevention of significant deterioration of air quality or PSD). See 40 CFR Part 55.

In Part C of Title I of the Act, Congress sets forth a program for preventing significant deterioration of air quality in areas that have air quality better than the National Ambient Air Quality Standards (NAAQS). Specifically, Congress established an approach for defining "significant deterioration" that relies upon changes in air quality concentrations from a baseline. The "baseline concentration" is defined in section 169(4) of the Act and the acceptable changes in concentration, called "increments," are defined in sections 163 (for Congressionally-established increments) and 166 (for EPA-established increments) of the Act.

Under Section 169(4) of the Act, the term "baseline concentration" means, "with respect to a pollutant, the ambient concentration levels which exist *at the time of the first application for a permit in an area subject to this part*, based on air quality data available in the Environmental Protection Agency or a State air pollution control agency and on such monitoring data as the permit applicant is required to submit. Such ambient concentration levels shall take into account

all projected emissions in, or which may affect, such area from any major emitting facility on which construction commenced prior to January 6, 1975, but which has not begun operation by the date of the baseline air quality concentrations determination. Emissions of sulfur oxides and particulate matter from any major emitting facility on which construction commenced after January 6, 1975, shall not be included in the baseline and shall be counted against the maximum allowable increases in pollutant concentrations established under this part.” (emphasis added). EPA has promulgated regulatory definitions for the phrases “the time of the first application for a permit” (known as the “minor source baseline date”) and “in an area subject to this part” (known as the “baseline area”). These definitions are found in 40 CFR 52.21(b) of EPA’s regulations and incorporated into the OCS regulations at 40 CFR 55.13.

The requirements to which OCS sources are subject depend on the distance of the source from shore. From the State’s seaward boundary (typically 3 miles from shore) and extending out 25 miles, the requirements for the Corresponding Onshore Area (COA), as well as federal requirements, apply to OCS sources; beyond 25 miles from the State’s seaward boundary, only federal requirements apply. See 40 CFR 55.3(b) and (c). Because of these different regulatory requirements, the implementation of PSD increments is different in these two portions of the OCS.

Sources located less than 25 miles from the State’s seaward boundary

In accordance with section 328 of the Act and EPA’s implementing regulations at 40 CFR Part 55, an OCS source located less than 25 miles from the State’s seaward boundary is subject to the same requirements as would be applicable if the source were located within the COA. Section 328(a) of the Act; 40 CFR 55.3(b). As a result, EPA incorporates by reference the air quality regulations, including the major source permitting programs, that are in effect in the COA and applies them to OCS sources inside this 25 miles limit. See 40 CFR 55.12. The OCS rules define the term “onshore area” in terms of the section 107(d) area designations. 40 CFR 55.2. Hence the COA is generally synonymous with a section 107(d) area and, if designated attainment or unclassifiable, with a PSD baseline area.

Since the COA PSD rules look to the designation of the COA for determining baseline dates, applying the COA PSD rule to an OCS source includes using the COA minor source baseline dates. Importantly, the minor source baseline dates for a section 107(d) area are not established in regulation, but rather they are determined through the implementation of the PSD regulations. See 40 CFR 52.21(b)(definition of “minor source baseline date”). Where the COA PSD rules apply on the OCS, the baseline date that has already been determined under the COA rule is the baseline date that applies for the permitting of the OCS source. This baseline date is then used to determine the baseline concentration in the area of the OCS source in accordance with the COA PSD rules.

When using the onshore minor source baseline date for OCS sources located less than 25 miles from the State’s seaward boundary, there is no need to define separate baseline areas (and hence section 107 area designations) for the OCS source. In fact, establishing this portion of the OCS as a separate baseline area, or extending the onshore baseline area onto the OCS, would be contrary to the current Part 55 rules which require a case-by-case determination of the COA for the purpose of determining the applicable onshore rules. See 40 CFR 55.5. Since the COA may be different than the nearest onshore area (NOA), and can actually differ from permit to permit,

the applicable permitting rules, and hence the baseline date, could be different than that of the NOA. As such, a fixed baseline area for the OCS within 25 miles of the State's seaward boundary could potentially prevent the utilization of the COA minor source baseline date, contrary to the intent of Congress that such sources be subject to the same requirements as would be applicable if the sources were located within the COA.

Sources located more than 25 miles beyond the State's seaward boundary

For sources locating on the OCS more than 25 miles from the State's seaward boundary, the EPA PSD rules at 40 CFR 52.21 apply. The definition of "baseline area" in the federal PSD rules relies on the existence of intrastate areas designated as attainment or unclassifiable under section 107(d) of the Act. See 40 CFR 52.21(b). Until EPA either designates section 107(d) areas on the OCS and/or promulgates revisions to the definition of "baseline area" in 40 CFR Part 55, it is appropriate to implement the term "baseline area" in 40 CFR 52.21(b), for OCS areas more than 25 miles from the State's seaward boundary by using the boundaries of the coastal Air Quality Control Regions on shore as a guide. Accordingly, the following areas will be considered as separate "baseline areas" for purposes of 40 CFR 52.21:

Each area bounded on the shoreward side by a parallel line 25 miles from the State's seaward boundary; on the seaward side by the boundary of U.S. territorial waters; and on the other two sides by the seaward extensions of the onshore Air Quality Control Region boundaries.

This approach is consistent with the approach of the Clean Air Act and EPA's implementing regulations for defining baseline areas on shore. Section 107 of the Act sets forth the criteria and processes for defining Air Quality Control Regions (AQCR's) and attainment/nonattainment designations. AQCR's for all States have been promulgated by EPA in 40 CFR Part 81, Subpart B. States are required, under section 107(d) to submit to the Administrator recommendations for attainment/nonattainment designations for (air quality control) regions or portions thereof. The final attainment/nonattainment designations for each State have been promulgated by EPA in 40 CFR Part 81, Subpart C. Under this statutory scheme, the largest possible onshore PSD baseline area is an AQCR. See Section 107(d) of the Act and 40 CFR 52.21(b)(definition of "baseline area"). The approach set forth in this memo essentially mirrors the onshore AQCR's for purposes of establishing separate offshore baseline areas in order to implement the PSD increments on the OCS for the areas more than 25 miles from the State's seaward boundary.

Once the "baseline area" is determined according to the above approach, the "minor source baseline date" and the "baseline concentration" are determined in accordance with the rules at 40 CFR 52.21.

cc: Herman Wong, OEA
Pat Nair, OAWT,
Doug Hardesty, OAWT
Natasha Greaves, OAWT



"Schuler, Alan E (DEC)"
<alan.schuler@alaska.gov>

08/26/2009 04:01 PM


To Herman Wong/R10/USEPA/US@EPA

cc Alan Schuler <alan.schuler@alaska.gov>, Kirk Winges
<kwinges@Environcorp.com>, Scott Winges
<swinges@Environcorp.com>

bcc

Subject ADEC Verification of Shell Regional Inventory

History:

 This message has been replied to and forwarded.

Herman,

I conducted a cursory review of Shell's North Slope regional inventory. I've also corresponded with Shell's consultant regarding the inventory (see attached e-mail).

It is very evident that Shell put lot of work into developing this inventory. Most aspects are acceptable. However, I have several comments and/or recommendations, which are provided below.

Stationary Source List/Location

1. Shell's off-site stationary source list is extensive and appears to be fairly complete. I only noticed one missing item – the drill rig and turbine associated with BPXA's Liberty development project (which is a component of the Endicott stationary source inventory). These emission units have been permitted, but may not be fully operational yet. However, since they could be operating concurrently with Shell's operation, ***Shell should include the Liberty rig/turbine in the off-site assessment*** .
2. The off-site inventory covers multiple UTM zones. Shell therefore established a consistent coordinate system (UTM Zone 6) for the modeling analysis. I viewed the resulting source locations using a proprietary ISC/AERMOD Graphical User Interface. (Shell provided the PM-10 input files so that I could do this – see attached email.) I also imported quad-maps from the USGS to provide a visual reference. While I did not take the time to confirm the accuracy of each stationary source location, the general layout matches the layout shown on industry maps.
3. It appears that Shell is using the very conservative approach of assessing the *combined* impact from the off-site stationary sources. This is conservative since many of the stationary sources could likely be culled from the inventory per Section 8.2.3 of the Guideline on Air Quality Models, due to non-overlapping significant impacts (with Shell's project).

Short-term Emission Rates

4. Shell modeled the annual emissions and then estimated the short-term impacts by doubling the annual concentration. I have no ready means for assessing the *general* accuracy of the 2-fold assumption. However, I did find that in the case of BPXA's Central

Compressor Plant and BPXA's Central Gas Facility (which are currently going through the PSD permit process for SO₂ emission increases), the maximum short-term emission rates can be *much greater* than Shell's 2-fold assumption. (I also found *limited* cases where Shell's emission rates are greater than the previously accepted emission rates – for an unknown reason.) Since Shell has access to the previously accepted maximum short-term emission rates for some of the stationary sources (especially the SO₂ emission rates), ***I recommend that they remodel the short-term SO₂ impacts using the highest available emission rate for a given emission unit*** . This approach should provide a more accurate assessment of the short-term impacts than use of the 2-fold factor.

Annual Emission Rates

5. I spot-checked Shell's potential NO_x emissions and found the values to be consistent with my records. I did not check any of Shell's actual annual emissions since that would take more work to confirm than what I could commit to this project (note: our applicants generally do not use actual emissions in their modeling assessments so the actual emission inventory is not readily accessible.)

Stack Parameters

6. I spot-checked Shell's stack parameters with the parameters used in the most recent modeling submittals by other applicants. Most of the values matched. Where differences were found, the values used by Shell are acceptable for an off-site inventory (i.e., they would likely result in a slightly more buoyant plume that would increase the potential for an overlapping impact with Shell's operations).

Additional Comments

7. Shell did *not* include downwash in their off-site analysis. This is appropriate given the large distances between Shell's project area and the off-site sources. However, this approach may need to be re-evaluated if this data set is used by future applicants with tighter source-source distances.

8. The only documentation I saw regarding the regional (off-site) inventory is the attached e-mail. ***Shell should provide in their application (if they haven't already) a short description of the general method used to develop the regional inventory*** .

9. My review was extremely cursory – which is adequate given: a) the large source-to-source distances; b) the resulting expectation that the off-site impact constitutes a small fraction of the total impact (which Shell's consultant verbally confirmed); and c) Shell's very conservative approach of combining the off-site impact. However, a more thorough review may be warranted if this data set is used by future applicants with tighter source-source distances.

Please contact me if you have any questions.

Alan

Alan Schuler, P.E.
Environmental Engineer
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From: Wong.Herman@epamail.epa.gov [mailto:Wong.Herman@epamail.epa.gov]
Sent: Monday, August 17, 2009 9:25 AM
To: Schuler, Alan E (DEC)
Subject: Fw: ADEC Verification

Alan:

EPA met and discussed with Shell's consultants, ENVIRON, about the air quality impact analysis requirements for a proposed PSD source in the Beaufort Sea. As part of the PSD requirements, they have developed a nearby allowable and actual emissions inventory (including stack parameters) based on information and data from ADEC's web site and files. We have informed Shell that we would accept the emissions inventories and stack parameters if ADEC determines them to be adequate.

I understand that Shell's consultant has already contacted you about this review. From my perspective, it would be most efficient for you to work directly with Shell and their consultant, since they will be able to answer any questions you may have about their emission calculations and assumptions, and the stack parameters when they are missing.

EPA request ADEC's assistance in reviewing the Shell's project emission inventories and stack parameters. Once you have completed the review, please provide your conclusions directly to me, along with any supporting documentation.

Thanks,

Herman

----- Message from "Schuler, Alan E (DEC)" <alan.schuler@alaska.gov> on Fri, 21 Aug 2009 11:43:05 -0800 -----

To: Scott Winges <swinges@Environcorp.com>
cc: Kirk Winges <kwinges@Environcorp.com>, "Schuler, Alan E (DEC)" <alan.schuler@alaska.gov>
Subject: RE: Regional Emission Inventory

Scott,

I got waylaid on another project, so just got to your 8/20/09 e-mail now. Your write-up is *very* helpful.

Your explanation for item 4 has triggered some thoughts which I should have recalled and shared with you when you were in our office. Applicants frequently modeled the unrestricted SO₂/PM-10 emissions in order to demonstrate compliance with the short-term standards/increments. For convenience, they used the same unrestricted SO₂/PM-10 emissions for demonstrating compliance with the annual SO₂/PM-10 standards/increments. This approach would be used even if there was an annual operating restriction imposed on the unit/source for NO_x reduction purposes (either to protect the NO₂ std/inc, or to avoid PSD-major classification). This is probably why the modeled SO₂/PM-10 emissions are inconsistent with the Title V emissions summary (which would reflect the SO₂/PM-10 emissions as restricted by the annual limit).

I'm going to look at a couple of other items and then get back with you and Kirk.

Alan

From: Scott Winges [mailto:swinges@Environcorp.com]
Sent: Thursday, August 20, 2009 2:51 PM
To: Schuler, Alan E (DEC)
Cc: Kirk Winges
Subject: RE: Regional Emission Inventory

Hi Alan,

The regional emissions inventory has evolved into an extraordinarily complex series of spreadsheets. I will do my best to answer your questions here, but this is very complicated, so please feel free to call me to discuss any further questions or concerns about the regional emissions inventory.

#1

I may not have read this right, but I believe what you're looking for is a key to link sources taken from ADEC files (for potential emissions) to sources that were taken from the ADEC emission inventory (for actual emissions). For the sources that we took from the emission inventory, the tables (usually) give a description of the emission source. Unfortunately, the only key I have for the modeling files I received from you is the one I received from you when I came up to grab the files. The key is very old, and more often than not it is unhelpful for determining what these model ID's represent. Instead of analyzing these on a source by source basis, I typically analyzed the facility as a whole – looking specifically at facility wide potentials to emit.

#4

The answer your question #4 is extremely complicated, but I will do my best to explain the steps taken...

When I grabbed modeling files from ADEC I QA/QC'd them quite a bit since there were many discrepancies on how facilities were modeled (it was very common to find multiple modeling files in which a facility was modeled in several completely different manners - with different total emissions). One method I used to resolve this was to compare title 5 permit conditions with these modeling files – specifically their potentials to emit. If I could find that the sum of all emissions (for a given pollutant) was close to their potential to emit I would assume that these modeling files were accurate and up to date and would use them to represent the facility. Unfortunately, many times I could only find up to date modeling files for 1 pollutant – typically NO_x. Since I primarily focused on NO_x emissions when I came up there, most of our NO_x files were complete and up to date. The PM10 files were a little less accurate, and the

SO2 files were even worse.

Many times the PM10 and especially the SO2 modeling files retrieved from ADEC represented a sum of emissions very different than the title 5 potential to emit. For instance, for the Central Compressor Plant example you brought up - if you were to add all the emissions up from the modeling files it would total (assuming we're looking at the same file) ~472 tons per year of SO2. The title 5 permit claims that the Central Compressor Plant has a maximum potential to emit of 147 tpy of SO2. Also, there were additional Central Compressor Plant sources modeled for NOx that were not included in these SO2 files. To deal with this issue, I first calculated the ratio of the facility's potential to emit for NOx to the facility's potential to emit for SO2. I then divided the potential NOx emissions (from the ADEC files that matched the title 5 permit) by the ratio of PTE NOx to SO2 to achieve potential SO2 emissions for each source - the sum of which is equal to the Title 5 permit potential to emit for SO2. I believe I did this for several facilities to achieve accurate emission totals.

I do not have a neat spreadsheet that documents all of these calculations. I have a couple "lovely" spreadsheets that document many calculations done for actual and potential emissions that we calculated, but this does not include the calculations done on ADEC files. If a spreadsheet documenting all of those calculations is needed I can provide it (with a little bit of time).

I uploaded reduced versions of the "lovely" spreadsheets to our ftp server so you can check them out. The two spreadsheets contain tons of calculations for each facility - so it might not be particularly easy to navigate, but it could be of use. You may access these on our ftp server at:
<ftp://ftp.environ.org/pub/webaccess/Shell/>

Again, this is a complicated emission inventory - so please do not hesitate to call me (or email me) with any questions.

Cheers,
-Scott

Scott Winges | Associate
ENVIRON International Corporation
Direct: 425.412.1821 | Fax: 425.412.1840
swinges@environcorp.com

From: Kirk Winges
Sent: Thursday, August 20, 2009 1:02 PM
To: Schuler, Alan E (DEC)
Cc: Eric Hansen; Mark Schindler; Scott Winges
Subject: RE: Regional Emission Inventory

Answers below in red

Kirk Winges | Principal Consultant
ENVIRON International Corporation
19020 33rd Avenue W, Suite 310
Lynnwood, WA 98036
V: 425.412.1813 | F: 425.412.1840

From: Schuler, Alan E (DEC) [mailto:alan.schuler@alaska.gov]
Sent: Thursday, August 20, 2009 12:50 PM
To: Kirk Winges
Cc: Eric Hansen; Mark Schindler; Alan Schuler

Subject: RE: Regional Emission Inventory

Kirk,

I have a couple of questions/requests regarding Shell's Regional Inventory.

1. Contrary to what I said yesterday on the phone, I do need a key that links the various sets of model IDs used in Shell's spreadsheet. For example, there are two sets of Model IDs (along with different inventory counts) for the BP Central Compressor Plant. Please provide a key to reconcile the Model ID numbers.

I'll get Scott to put together a key for you. I'll try to have that to you later today.

2. Did Shell use annual emissions to model the *short-term* averaging periods, or did they use unrestricted emissions (which would be the proper way – unless there's a short-term operating limit)?

No, we used 2X times annual for short term. We literally had nothing to go on for short term, so that's best we could come up with.

3. Was BP's "Liberty" project included in the regional modeling analysis? I didn't see it, but given the size of the inventory, I may have overlooked it. (The Liberty project is a massive drill rig and turbine that will be located at Endicott).

No, it was not in there. We had no actuals for that source, only potentials.

4. I'm coming up with very different annual SO₂ emissions in many of my spot-checks (and in some cases, slightly different PM-10 emissions). For example, for model ID 801P (BP CCP) I'm coming up with an SO₂ PTE of 32 tpy based on BP's recently modeled emission rate of 0.92 g/s. Shell had 10 tpy (9.89 tpy to be exact). Please provide sample emission calculations, or the spreadsheets used to derive the emissions.

I will send you the ugly spreadsheet with all the calculations. Some of these discrepancies may result from access you have to modeling files and/or information we didn't have. Sometimes, we had conflicting info as well, and had to make a judgment call.

Thanks.

Alan

From: Kirk Winges [mailto:kwinges@Environcorp.com]

Sent: Friday, August 14, 2009 1:07 PM

To: Schuler, Alan E (DEC)

Cc: Eric Hansen; Mark Schindler

Subject: Regional Emission Inventory

Hi Alan:

As I indicated, I am providing our regional emission inventory for the Prudhoe Bay area. I have a much uglier spreadsheet that has all the calculations fed into it. It's barely small enough for email (about 9MB), but the main reason I haven't sent it is that it's very messy, with lots of notes and other stuff that might be confusing. If at some point you get involved and would like to see all the background details, I am happy to provide that.

Kirk

Kirk D. Winges | Principal Consultant

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----- Message from Kirk Winges <kwinges@Environcorp.com> on Fri, 14 Aug 2009 13:07:17 -0800

To: "Schuler, Alan E (DEC)" <alan.schuler@alaska.gov>

cc: Eric Hansen <ehansen@Environcorp.com>, Mark Schindler <mark.octane@me.com>

Subject: Regional Emission Inventory

Hi Alan:

As I indicated, I am providing our regional emission inventory for the Prudhoe Bay area. I have a much uglier spreadsheet that has all the calculations fed into it. It's barely small enough for email (about 9MB), but the main reason I haven't sent it is that it's very mess, with lots of notes and other stuff that might be confusing. If at some point you get involved and would like to see all the background details, I am happy to provide that.

Kirk

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delete all copies of the message. TableOnly.xls

----- Message from Kirk Winges <kwinges@Environcorp.com> on Wed, 19 Aug 2009 15:56:11 -0800

To: "Schuler, Alan E (DEC)"
<alan.schuler@alaska.gov>

Subject: Input files

Here's a couple of model input files. One for PM10 actual emission and one for PM10 potential emissions.

Kirk Winges | Principal Consultant

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