

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

The Environmental Protection Agency (EPA) Region 10 is supplementing its Environmental Justice Analysis for two Clean Air Act (CAA) permits authorizing exploratory drilling in the Outer Continental Shelf (OCS) in the Chukchi and Beaufort Seas. On March 31, 2010, pursuant to CAA section 328, 42 U.S.C. § 7627, Region 10 issued an OCS Prevention of Significant Deterioration (PSD) Permit to Construct to Shell Gulf of Mexico, Inc. (SGMOI) for operations in the Chukchi Sea (2010 Chukchi Permit). On April 9, 2010, Region 10 issued another OCS PSD Permit to Construct (2010 Beaufort Permit) to Shell Offshore, Inc. (SOI)¹ for operations in the Beaufort Sea.

Following petitions for review to the Environmental Appeals Board (EAB or Board), the Board remanded the 2010 Chukchi Permit and the 2010 Beaufort Permit (2010 Permits) back to Region 10 for further consideration of several issues, including Region 10's environmental justice analysis. See *In re: Shell Gulf of Mexico, Inc. and Shell Offshore, Inc.*, OCS Appeal Nos. 10-1 to 10-4, Slip Op. at 63-4, Order Denying Review in Part and Remanding Permits (EAB December 30, 2010) (Remand Order I). See also Order on Motions for Reconsideration and/or Clarification (EAB February 10, 2011) (Clarification Order), and Order on Four Additional Issues (March 14, 2011) (Remand Order II).² The orders will be collectively referred to as the "EAB Orders."

Region 10 is now proposing revisions to the 2010 Permits to address the EAB Orders. This Supplemental Environmental Justice Analysis supplements the analysis conducted to support the 2010 Permits and together with other documents in the administrative record, provides support for the revised draft permits Region 10 is proposing in response to the EAB Orders and changes requested by Shell. It is important to note that the extent of an Environmental Justice Analysis will vary according to the unique circumstances of each case. The scope of the analysis conducted in this case was shaped by the fact that Region 10's previous Environmental Justice

¹ SOI and SOGMI will be collectively referred to as Shell. This Supplemental Environmental Justice Analysis addresses both revised draft permits authorizing operation in the Chukchi and Beaufort Seas, respectively.

² The petitions, briefs, and motions filed by the parties, as well as the orders of the Board relating to the 2010 Permits are available on the EAB Website at http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/de2e53f0c6b155f085257719005ba945!OpenDocument, Shell Gulf of Mexico, Inc and Shell Offshore, Inc., Frontier Discoverer Drilling Units, OCS Appeal Nos. 10-01 through 10-04. For ease of reference in this document, filings in the EAB proceedings will be referred to by the title and date of the document and will not repeat the case name and number.

Analysis was the subject of a remand by the Board, the communities' unique use of a broad geographic area for subsistence activities, and the other unique characteristics of the potentially affected communities.

As discussed in more detail below, based on available information, Region 10 concludes that the activities proposed to be authorized under the permits will not have disproportionately high and adverse human health or environmental effects with respect to air pollutants authorized under these permits on minority or low-income populations residing in the North Slope, including coastal communities closest to the proposed operations. In reaching this conclusion, Region 10 considered the impact on communities while engaging in subsistence activities in areas where such activities are regularly conducted.

Environmental Justice in PSD Permitting

Executive Order 12898 entitled “Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations” states in relevant part that “each Federal agency shall make achieving Environmental Justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” Section 1-101 of Exec. Order 12898, 59 Fed. Reg. 7629, (Feb. 16, 1994). “Federal agencies are required to implement this order consistent with, and to the extent permitted by, existing law.” *Id.* at 7632. Based on this Executive Order, the EAB has held that environmental justice issues must be considered in connection with the issuance of federal PSD permits issued by EPA Regional Offices. *See, e.g., In re Prairie State Generating Company*, 13 E.A.D. 1, 123 (EAB 2006); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 174-75 (EAB 1999) (Knauf I). The EAB reinforced the importance of completing an adequate environmental justice analysis in its recent opinion remanding the 2010 Permits to Region 10. *See* Remand Order I at 63-81.

For purposes of the Executive Order on Environmental Justice, EPA has recognized that compliance with the applicable National Ambient Air Quality Standards (NAAQS) is emblematic of achieving a level of public health protection that demonstrates that EPA’s issuance of a PSD permit for a proposed facility will not have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. *See, e.g., Shell Remand Order I* at 74; *In re Shell Offshore Inc.*, 13 E.A.D. 357, 404-5 (EAB 2007) (Shell I); *In re Knauf Fiber Glass, GmbH*, 9 E.A.D. 1, 15-17 (EAB 2000) (Knauf II); *In re AES Puerto Rico, L.P.*, 8 E.A.D. 324, 351 (EAB 1999). This is because the NAAQS are health-based standards, designed to protect public health with an adequate margin of safety, including sensitive populations such as children, the elderly, and asthmatics. As the EAB recently observed in remanding the 2010 Permits to Region 10, “[i]n the context of an environmental justice analysis, compliance with the NAAQS is emblematic of achieving a level of public health protection that, based on the level of protection afforded by the NAAQS,

demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental effects due to exposure to relevant criteria pollutants.” Remand Order I at 73. This is supported by the fact that “[t]he Agency sets the NAAQS using technical and scientific expertise, ensuring that the primary NAAQS protects the public health with an adequate margin of safety.” Remand Order I at 73.

The studies assessed by EPA in setting NAAQS and the integration of the scientific evidence presented therein have undergone extensive critical review by EPA, the Clean Air Scientific Advisory Committee (CASAC), and the public. Final Rule, 75 Fed. Reg. 6474, 6478 (Feb. 9, 2010). “The rigor of the review makes these studies, and their integrative assessment, the most reliable source of scientific information on which to base decisions on the NAAQS.” Id. When setting the NAAQS, “[t]he Administrator’s final decisions draw upon scientific information and analysis related to health effects, population exposures, and risks; judgments about the appropriate response to the range of uncertainties that are inherent in scientific evidence and analyses; and comment received from CASAC and the public.” Id. at 6483. In light of these characteristics of the process for setting the standards, the EAB generally “relies on and defers to the Agency’s cumulative expertise when upholding a permit issuer’s environmental justice analysis based on a proposed facility’s compliance with the relevant NAAQS in a PSD appeal.” Remand Order Slip. Op. 74. The NAAQS are also the underpinning for the State Implementation Plan process, which requires states to adopt rules and programs that will reduce emissions causing air pollution.

Relevant Permitting History

In the Environmental Justice Analysis supporting issuance of the 2010 Permits, Region 10 determined that issuance of the 2010 Permits would not have disproportionately high or adverse human health or environmental effects on minority or low-income populations. 2010 Chukchi Response to Comments at 138; 2010 Beaufort Response to Comments at 63. Region 10 based this decision on that fact that the 2010 Permits would not interfere with attainment or maintenance of the NAAQS that were in effect at the time of issuance of the 2010 Permits and the fact that the NAAQS are health based standards set at levels designed to protect public health, including sensitive individuals, with an adequate margin of safety. 2010 Chukchi Response to Comments at 138-139. The Board disagreed with Region 10’s conclusion:

With respect to the environmental justice analysis, the Board concludes that the Region clearly erred when it relied solely on demonstrated compliance with the then-existing annual [nitrogen dioxide (NO₂)] NO₂ NAAQS as sufficient to find that the Alaska Native population would not experience disproportionately high and adverse human health or environmental effects from the permitted activity. The Region’s reliance solely on compliance with the annual NO₂ standard when it issued the Chukchi and Beaufort Permits on March 31 and April 9, 2010, was clearly erroneous given that the

Administrator proposed a rule, published in the Federal Register on July 15, 2009 which made available updated scientific evidence supporting the Administrator's proposal to supplement the annual NO₂ NAAQS with a 1-hour NO₂ NAAQS. The Administrator concluded that the annual NO₂ NAAQS alone did not provide requisite protection of public health and established a supplemental 1-hour NO₂ NAAQS in a final rule published in the Federal Register on February 9, 2010, several weeks prior to the Region issuing the [2010 Permits].

Remand Order I at 81-82.

The Board also identified several other issues as a basis for ordering a remand of the 2010 Permits for further consideration. In addition, Shell provided information to support its request for several other changes to the 2010 Permits, including permit terms and conditions to assure that emissions to be authorized under the 2010 Permits assure compliance with requirements that have come into effect since issuance of the 2010 permits, including the new 1-hour NO₂ NAAQS. Region 10 is issuing revised draft permits for public comments addressing the issues raised by the EAB Orders and the changes requested by Shell (these permits will be referred to as the "2011 Revised Draft Permits"). This Supplemental Environmental Justice Analysis is part of the administrative record to support the 2011 Revised Draft Permits.

In the EAB Orders, the Board found that Region 10's analysis of environmental justice issues relating to the permit was deficient with respect to consideration of the new 1-hour NO₂ NAAQS that had been promulgated but was not yet effective at time of issuance of the 2010 Permits. This Supplemental Environmental Justice Analysis therefore focuses particularly on the available information regarding the impact of the 2011 Revised Draft Permits on NO₂ levels in the area with respect to the new 1-hour NO₂ standard, as well as available information with respect to the new 1-hour SO₂ standard that has gone into effect since issuance of the 2010 Permits. It also considers ambient air quality data that has been collected since issuance of the 2010 Permits and consideration of precursors to particulate matter emissions equal to or less than 2.5 microns (PM_{2.5}).

Operations Authorized Under the 2011 Revised Draft Permits

The 2011 Revised Draft Permits are similar to the 2010 Permits in terms of the location and scope of the authorized activities, although emissions under the 2011 Revised Draft Permits have been reduced significantly. The 2011 Revised Draft Permits authorize the operation of the Discoverer drillship to conduct air pollutant emitting activities for the purpose of oil exploration on lease blocks in the Chukchi and Beaufort Seas off the North Slope of Alaska as authorized by the BOEMRE. Both 2011 Revised Draft Permits also provide for the use of an associated fleet of support ships (Associated Fleet), such as icebreakers, a supply ship, and an oil spill response fleet, in addition to the Discoverer. Exploratory operations under each permit are authorized from July 1 to November 30 to each year, and are limited to 120 days as an OCS source. Note

that, although each permit authorizes 120 days of OCS operation between July 1 and November 30, 2011, both permits require the use of the same drillship (the Discoverer) in both the Chukchi and Beaufort Seas.

In the Chukchi Sea, the leases include all of Shell's leases from lease sale 193. In the Beaufort Sea, leases to be authorized under the permit include certain identified Shell leases from lease sales 195 and 202.

As provided in the applicable permitting program (PSD, 40 CFR § 52.21), the emission units on board the Discoverer drillship will be required to meet emission limits that represent Best Available Control Technology (BACT). This will be accomplished through the use of selective catalytic reduction (SCR) and oxidation catalyst (OxyCat) on the Discoverer's main generator engines to reduce nitrogen dioxide (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), and particulate matter (PM); the use of Tier 3 engines or engines equipped with Catalytic Diesel Particulate Filters (CDPF) for other engines on the Discoverer to reduce CO, VOC, and PM; and the use of ultra low sulfur diesel fuel (ULSD) to reduce emissions of sulfur dioxide (SO₂) and sulfuric acid mist (H₂SO₄). To further reduce impacts on the ambient air, the Associated Fleet will be subject to operational restrictions and some emissions units will be equipped with controls, including the use of ULSD in all of the Associated Fleet and SCR and/or OxyCat on the propulsion engines and main generator engines on the icebreakers. Emissions from the Associated Fleet when located within 25 miles of the Discoverer, together with emissions from the Discoverer, are considered in conducting an ambient air quality analysis to determine whether emissions from the project will cause or contribute to a violation of the NAAQS or applicable increments.

Note that, as discussed in the Supplemental Statement of Basis, emissions authorized under the 2011 Revised Draft Permits are greatly reduced in comparison to the 2010 Permits due to the installation of SCR and OxyCat on the propulsion and generator engines on the Icebreaker #1 and a reduction in the total authorized operating days from 168 to 120 days.

Northern Iñupiat Communities³

³ The demographic and health factors discussed in this section have been chosen because the EPA commonly associates them with vulnerability or susceptibility to adverse health effects from air pollution. According to the Primary National Ambient Air Quality Standards for Nitrogen Dioxide (NO₂) Final Rule 75 Fed Reg 6481, (Feb. 9, 2010) "The term susceptibility generally encompasses innate (*e.g.*, genetic or developmental) and/or acquired (*e.g.*, age or disease) factors that make individuals more likely to experience effects with exposure to pollutants. The severity of health effects experienced by a susceptible subgroup may be much greater than that experienced by the population at large. Factors that may influence susceptibility to the effects of air pollution include age (*e.g.*, infants, children, elderly); gender; race/ethnicity; genetic factors; and preexisting disease/condition (*e.g.*, obesity, diabetes, respiratory disease, asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease, airway hyperresponsiveness, respiratory infection, adverse birth outcome) (ISA, sections 4.3.1, 4.3.5, and 5.3.2.8). Factors that may influence susceptibility and vulnerability to air pollution include socioeconomic status (SES), education level, air conditioning use, proximity to roadways, geographic location, level of physical activity, and work

The North Slope is bordered by the Arctic Ocean to the north and the Brooks Mountain Range to the south. In all it encompasses approximately 89,000 square miles of northern Alaska. The incorporated villages of the North Slope Borough (NSB) include Point Hope, Point Lay, Wainwright, Atkasuk, Barrow, Nuiqsut, Kaktovik and Anaktuvuk Pass. These communities are situated completely above the Arctic Circle and are considered remote villages, with no roads between them. Most of the communities are coastal villages located near the Chukchi and Beaufort Seas. The nearest towns or villages to Shell's exploratory operations in the Chukchi Sea are Point Lay and Wainwright, located 99 and 105 kilometers (61 and 65 miles), respectively, from the closest lease block in the Chukchi Sea. According to the 2011 Exploration Plan submitted by Shell to BOEMRE, Shell plans to drill approximately six wells beginning in 2012 in the Burger Prospect, which is located approximately 160 and 144 kilometers (100 and 90 miles) from Point Lay and Wainwright, respectively.⁴

The nearest towns or villages to Shell's exploratory operations in the Beaufort Sea are Kaktovik, Deadhorse, and Nuiqsut, which are located 14, 84, and 193 kilometers (8, 52, and 120 miles), respectively, from the closest lease block in the Beaufort Sea. According to the 2011 Exploration Plan submitted by Shell to BOEMRE for the Beaufort Sea, Shell plans to drill four wells on three OCS lease blocks in an area lying east of Point Thompson near Camden Bay of the Beaufort Sea beginning in the summer of 2012, two wells each in the Sivulliq and Torpedo prospects.⁵ These prospects are located approximately 96, 88, and 193 kilometers (60, 55, and 120 miles) from Kaktovik, Deadhorse and Nuiqsut, respectively. Figure 1 shows the location of the Shell leases with reference to the shoreline and the nearest towns and villages.

As discussed below, a review of demographic characteristics shows that these communities have a significantly high percentage of Alaska Natives, who are considered a minority under EO 12898, and a significant percentage of individuals who speak a language other than English at home.

Subsistence foods from traditional practices such as hunting (marine mammals, terrestrial and birds), fishing, and whaling are an important component of the Iñupiat diet.⁶ In 2004, the Alaska Department of Fish and Game reported that over a 25 year period residents in the North Slope Borough harvested an average of 434 pounds of subsistence food per capita.⁷

environment (*e.g.*, indoor versus outdoor) (ISA, section 4.3.5)"
<http://www.epa.gov/ttnnaqs/standards/nox/fr/20100209.pdf>

⁴ 2012 Outer Continental Shelf Lease Camden Bay Exploration Plan, and associated Oil Discharge Prevention and Contingency Plan (ODPCP), May 4, 2011.

⁵ Revised Outer Continental Shelf Lease Exploration Plan and associated Oil Discharge Prevention and Contingency Plan (ODPCP), Chukchi Sea, Alaska, May 12, 2011.

⁶ Wernham, Inupiat Health and Proposed Alaskan Oil Development: Results of the First Intergrated Health Impact Assessment/Environmental Impact Statement for Proposed Oil Development on Alaska's North Slope, 2007.

Subsistence activities also play an important cultural role. In the words of the Environmental Director of the Iñupiat Community of the Arctic Slope (ICAS), speaking at the Environmental Justice Session held during the 2011 Alaska Forum on the Environment, “For thousands of years, our people have depended on a subsistence lifestyle for a large majority of our food, and also for our cultural and spiritual health. Through the subsistence hunt, we not only provide food for our families, but we also carry on the ancient traditions that have been passed down to us by our parents and grandparents. Our subsistence activities define who we are and bind us together as a community. We therefore depend on the land and sea for our survival and we hold the deepest and most profound respect for the natural resources that have sustained us for so many years. Our very survival as a people depends on our ability to safeguard and protect the resources that have provided for us for thousands of years.”

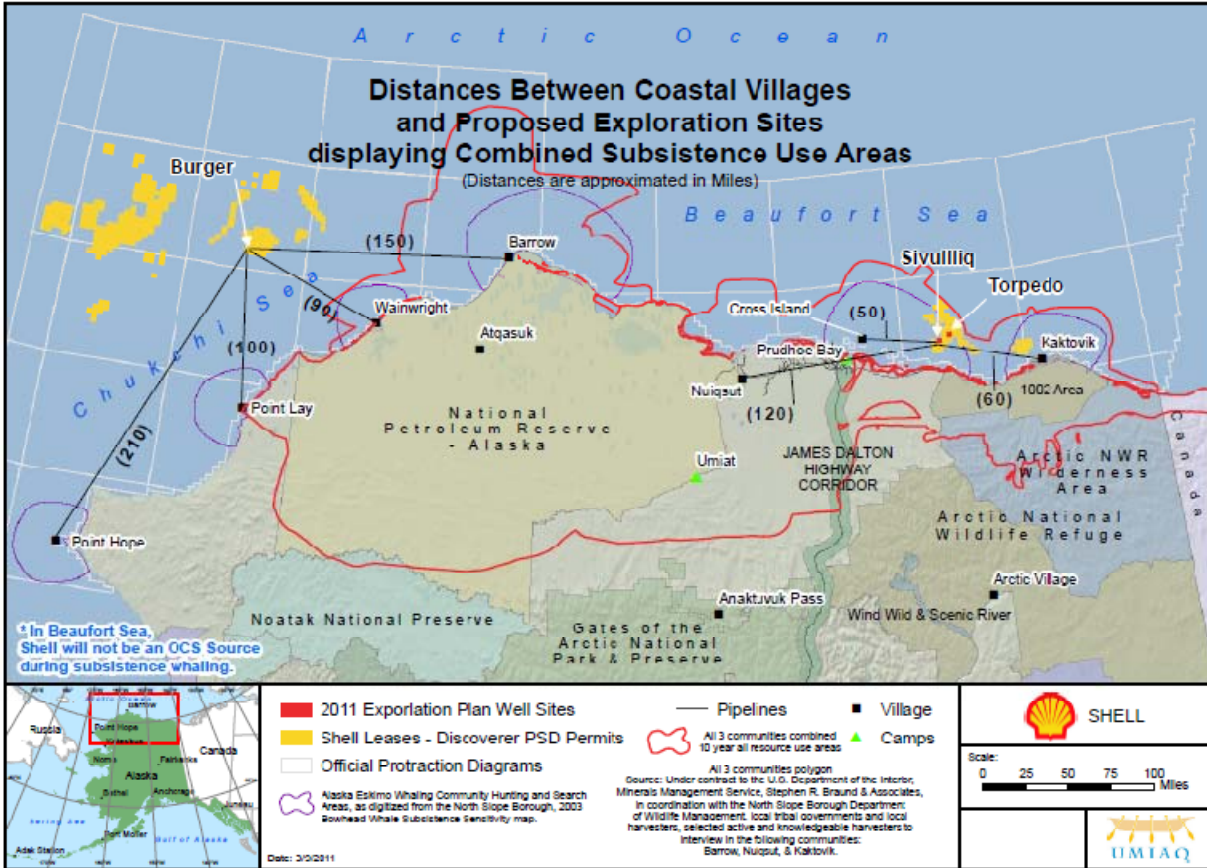
Figure 1 depicts Shell’s lease block in the Chukchi and Beaufort Seas overlaid with an outline of onshore and offshore subsistence use areas. Nuiqsut residents have reported traveling up to 96 kilometers (60 miles) offshore to the north and as far east as Camden Bay to hunt for bowhead whale. Subsistence use areas extend to the west to Cape Halkett for seal. Kaktovik residents reported offshore subsistence use of 56 kilometers (35 miles) out for bowhead and walrus; along the coast their use extends as far east as the Mackenzie River Delta in Canada (fish and waterfowl) and to the west as far as the Return Islands near the Kuparuk River Delta (waterfowl).⁸

As discussed in more detail below, available information and analysis of the emissions from the Discoverer and the Associated Fleet, in conjunction with background air quality data, show that the NAAQS will continue to be met in all areas more than 500 meters from the Discoverer drillship, and will be well below the NAAQS in the on-shore communities in both the Beaufort and Chukchi Seas.

⁷ Wolfe, R. J. 2004. Local traditions and subsistence: a synopsis of twenty-five years of research in Alaska. Technical Paper No. 284. Alaska Department of Fish and Game, Division of Subsistence, Juneau, Alaska.

⁸ Stephen R. Braund & Associates. Report of Traditional Knowledge Workshops – Point Lay, Barrow, Nuiqsut, and Kaktovik. Chukchi and Beaufort Seas National Pollutant Discharge Elimination System Exploration General Permits Reissuance. 2011.

Figure 1 Subsistence Use Areas Mapped Over Exploration Sites



Demographics⁹

In an effort to assess the potential for disproportionate impacts on minority and low-income populations potentially affected by the activities proposed to be authorized under the 2011 Revised Draft Permits, Region 10 has considered available demographic information for the North Slope Borough with respect to two reference populations--the state of Alaska and the United States of America.

Table 1 Population, Age and Race

Location	Total Population	Under 5	Over 65	American Indian or Alaska Native	Asian	White	African American	Hispanic or Latino
North Slope Borough	7,385	9.50%	4.20%	68.40%	5.90%	17.10%	0.70%	2.20%
State of Alaska	626,932	7.60%	5.70%	15.60%	4.00%	69.30%	3.50%	4.10%
United States	3.1B	6.80%	12.40%	0.90%	3.60%	75.10%	12.30%	12.50%

(2000 US Census)

In total, the eight villages in the North Slope Borough are comprised of 7,385 people. The populations range in size from 228 to 4,581 residents. In comparison to the rest of the Alaska, these eight villages have a slightly higher number of children under 5 yet a slightly lower number of people 65 and older. EPA's Final Report Integrated Science Assessment for Oxides of Nitrogen – Health Criteria (ISA) specifically identified children,¹⁰ (defined here as under 18 years old) older adults (65+ years) and sensitive populations (such as those with preexisting respiratory problems) as being particularly vulnerable to NO₂ impacts.¹¹ Sixty-eight percent of

⁹ Data was gathered from the 2000 US Census via American Fact Finder at http://factfinder.census.gov/home/saff/main.html?_lang=en

¹⁰ Children are particularly vulnerable to adverse health effects from air pollution because:

- Children's lungs are still developing. This period of growth and development of the lungs is a critical time period for health effects from exposure to air pollution. Exposures to air pollutants during this time can have life-long effects on the lungs, including lung capacity, the diameter of the airways, and the number and types of cells that line the airways. It is important to note that airways develop through adolescence.
- Children breathe in more air than adults compared to their body weight, leading to a higher dose of air pollution.
- Children's airways are narrower than adults, making them more susceptible to air pollution.
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¹¹ Integrated Science Assessment for Oxides of Nitrogen – Health Criteria (Final Report), Section 4.3, U.S. Environmental Protection Agency, Washington DC, EPA/600/R-08/071, 2008

all people classify themselves as Alaskan Natives, making them the majority population in the North Slope Borough. This number is significantly higher than the Alaskan Native/ Native American population in both the State of Alaska and the United States as a whole. Asians comprise the second largest minority group in this area making up nearly 6% of the total populace.

Table 2 Social Characteristics

Location	Total Population	Population 25 & Over	High School or Higher	Associate's Degree	Bachelor's Degree or Higher	Speak a language other than English at home
North Slope Borough	7,385	52.58%	77.40%	3.90%	17.00%	49.90%
State of Alaska	626,932	60.54%	88.30%	7.20%	24.70%	14.30%
United States	3.1B	63.45%	80.40%	6.30%	24.40%	17.90%

(2000 US Census)

A little more than half of the population in the North Slope is over 25 year of age. Within this group, 77.40% of residents report earning at least a high school diploma. This number is slightly lower than both reference populations. Education level is a factor that may influence susceptibility and vulnerability to air pollution. Limited formal education is a barrier to employment, health care and social resources, and can increase the risk of poverty, stress, and impacts from environmental stressors. Over 20% of people over 25 have earned at least an Associate’s degree. Nearly half the people who reside in the North Slope speak a language other than English at home, which is significantly higher than those in the State of Alaska and the United States of America.

Table 3 Economic Characteristics

Location	Total Population	Population In Labor Force	Individuals Below Poverty	Children 5-17 Below Poverty
North Slope Borough	7,385	72.20%	9.10%	9.00%
State of Alaska	626,932	71.30%	9.40%	10.30%
United States	3.1B	63.90%	12.40%	15.40%

(2000 US Census)

Seventy-two percent of those 16 and older are reported as being in the labor force. This indicates that there are employment opportunities for residents within the Borough. Less than 10% of all

North Slope residents live in poverty, a number that is somewhat less in proportion to those in the United States. The percent of children 5-17 living below poverty in the North Slope is 9% which is less than the percentage of children of the same age living in poverty in both the state of Alaska and the United States.

Health¹²

The 2009 Alaska Native Health Status Report issued by the Alaska Native Tribal Health Consortium provides an overview of health conditions in this region.

Between 2004-2007, the leading causes of death in Alaskan Natives living in the North Slope were cancer, heart disease, suicide, unintentional injury and chronic obstructive pulmonary disease (COPD). This is fairly consistent with the death rates of Alaskan Natives across the state. Cancer is the leading cause of death for Alaska Native people, accounting for 1 out of every 5 deaths. The Alaska Native cancer death rate was 30% greater than for U.S. Whites. Heart disease is the second leading cause of death for Alaska Native people.¹³

Over the 2 year period 2005-2007, more than 30% of adults in the North Slope area were classified as obese. There are nearly three times (58% vs. 20%) as many Alaska Native people in this area who are current smokers than that of Alaska non Natives.

Only 30% of pregnant Alaskan Native women in the area had access to adequate prenatal care between 2006-2007. However these numbers are lower than the state average of 46%. In the Arctic Slope, 6% of children were born with a low birth weight compared to a statewide average of 5%.

Overall, from 1990 to 2007, there has been a large increase in the prevalence of diabetes for Alaskan Natives statewide. The percent of rate increase has jumped to 117% over the 17 year time frame. This increase is present in the North Slope region, with a 158% increase.

Infrastructure development has been a health concern for Alaskans. The percent of housing units with water and sewer service varies by major rural regional health corporation, from 58% to 98%. In 2008 it was reported that 94% of the Alaskan Natives in the North Slope region had

¹²Alaska Native Tribal Health Consortium: Alaska Native Epidemiology Center. Alaska Native Health Status Report 2009 http://www.anthc.org/chs/epicenter/upload/01_HSRintro.pdf

The Arctic Slope Service area as defined by Alaska Native Tribal Health Consortium covers the North Slope Borough with the exception of Point Hope, which falls under the Northwest Arctic service area. Point Hope is located the furthest distance from the activities proposed for authorization under the permits. The health statistics for the Northwest Arctic Service Area do not differ significantly in most respects from the statistics presented here for villages that are located much closer to the proposed activities. Please visit the Alaska Native Health Status Report for more details.

¹³ Id.

access to water and sewer service. This is well above the percentages of Alaskan Natives statewide.

There is a higher incidence of outpatient visits for upper respiratory problems in the North Slope than in the rest of Alaska. In fact, in 2006 diseases of the respiratory system were the leading cause for inpatient hospitalization at Samuel Simmons Memorial Hospital in Barrow.

Respiratory issues range from the common cold (acute) to pneumonia (severe).¹⁴

As discussed below, EPA has identified people with respiratory problems to be potentially at greater risk of experiencing adverse health effects from NO₂ and SO₂. This was taken into consideration when setting the new NAAQS standards. 75 Fed. Reg. 6481 (February 9, 2010); 75 Fed. Reg. 35527 (June 22, 2010).

Table 4 Health Overview

Health Indicators	North Slope	Alaskan Natives Statewide	Year
Obese (BMI 30+)	37%	31%	2005-2007
Current Smokers	58%	41%	2005-2007
Adequate Prenatal Care	37%	46%	2006-2007
Low Birth Weight	6%	5%	2006-2007
Diabetes: % Rate of Increase since 1990	158%	117%	2007
Outpatient Visit for Upper Respiratory Problems	12%	8%	2005

(ANTHC 2009)

Community Outreach

Oil and gas operations in the Chukchi and Beaufort Seas are of great interest to the Northern Inupiat communities. Region 10 has taken several measures to provide meaningful involvement for the communities of concern potentially impacted by the 2011 Revised Draft Permits. Recognizing the challenges and special considerations that are required in communicating with people in more than one culture for whom English is a second language, in May 2009, Region 10 issued the North Slope Communications Protocol establishing communications guidelines to specifically support meaningful involvement of North Slope communities in Region 10 decision-making. The goal of the protocol is to improve the agency’s effectiveness in working with North Slope communities.

¹⁴ Alaska Native Tribal Health Consortium: Alaska Native Epidemiology Center. Regional Health Profile: Arctic Slope, 2009. http://www.anthc.org/chs/epicenter/upload/Regional_Health_Profile_ASNA_1109.pdf

Health indicators presented are for villages that are located closer to the proposed activities. Please visit the Alaska Native Health Status Report for more details.

In an effort to engage the potentially affected communities at the beginning of the process, managers of Region 10's air and water programs conducted early outreach on air and water permitting in May 2009 in Kotzebue and Barrow. Region 10 also held meetings and conference calls to specifically solicit input on environmental justice concerns related to these permitting actions, as well as other potential OCS air permitting actions on the Chukchi and Beaufort Seas. In addition, Region 10 held public hearings and community meetings on the North Slope prior to finalizing the 2010 Permits. Consistent with the North Slope Communications Protocol, Region 10 made every effort to assist non-English speakers by having Inupiaq translators available at each meeting and hearing. In an effort to solicit tribal and public involvement at agency sponsored meetings and/or outreach activities, Region 10 has sent out written communication reminders to its community contacts to encourage participation.

These efforts continue. Early public information meetings were held in Kaktovik and Barrow during the week of June 13, 2011. Invitations went out to communities across the North Slope to encourage participation in the centrally located Barrow meeting. Those who could not travel to the meeting were able to participate via teleconference. Region 10 is holding a comment period on the 2011 Revised Draft Permits and, in anticipation of a significant degree of public interest in the proposed permits, the agency is also scheduling a public hearing on the North Slope with a teleconference line available for other communities to call in. Region 10 will consider all comments received at the hearings or during the public comment period prior to taking final action on the 2011 Revised Draft Permits. Region 10 specifically solicits public comment on this Supplemental Environmental Justice Analysis.

Note that the draft permits require Shell to have a plan for communicating to the North Slope communities on a periodic basis regarding when exploration activities are expected to begin and end at a drill site, the location of the drill site, and applicable restrictions on activities in the vicinity of Shell's exploration operations.

Air Impacts Analysis

Pursuant to Section 328 of the Clean Air Act (CAA), 42 U.S.C. § 7627, EPA promulgated air quality regulations applicable to OCS sources, which regulations are set forth in 40 C.F.R. part 55. Under these regulations, Shell must obtain OCS/PSD permits for these projects prior to conducting exploratory drilling in the OCS. This section addresses Region 10's consideration of environmental justice impacts directly related to air quality, focusing on whether the issuance of the 2011 Revised Draft Permits would have disproportionately high and adverse human health or environmental effects on Alaska's northern Iñupiat communities along the Beaufort and Chukchi Seas living and engaging in subsistence activities in areas closest to the activities proposed to be permitted.

NAAQS

As discussed above, National Ambient Air Quality Standards or NAAQS are health-based standards that have been set at a level such that their attainment and maintenance will protect public health, including sensitive individuals, with an adequate margin of safety.¹⁵ See Section 109(b) of the CAA. As required by the applicable OCS and PSD regulations, the terms and conditions of any final permits issued must ensure that activities authorized by these permits will not cause or contribute to a violation of the NAAQS standards or exceed applicable increments.¹⁶ Increments are established for NAAQS pollutants and represent the maximum allowable increase over the baseline concentration in any area. See 40 C.F.R. § 52.21(k).

EPA generally uses two NAAQS designation categories as outlined in 40 CFR part 81, attainment/unclassifiable or nonattainment. The North Slope Borough is in an area currently designated as attainment/unclassifiable for all of the NAAQS. This means that the North Slope has sufficient data to determine that the area is meeting the NAAQS or that due to no data or insufficient data, EPA cannot make a determination.¹⁷

On January 22, 2010, EPA promulgated a new 1-hour NAAQS for NO₂ of 100 parts per billion (ppb) (188 µg/m³) to provide increased public health protection from short-term NO₂ exposures. These exposures have been linked to respiratory illnesses that lead to emergency room visits and hospital admissions, particularly in at-risk populations such as children, the elderly, and people with respiratory disease. The standard became effective on April 12, 2010.

On June 2, 2010, EPA announced a new 1-hour SO₂ NAAQS which is attained when the 3-year average of the 99th-percentile of the annual distribution of daily maximum 1-hour concentration does not exceed 75 ppb (196 µg/m³). These exposures have also been linked to respiratory

¹⁵ Sensitive individuals include children, the elderly, and people with respiratory disease

¹⁶ See 40 C.F.R. §§ 55.13(d), 52.21(a)(2)(iii) and 52.21(k)

¹⁷ CAA 107(d) Designations

(1) Designations generally

(A) Submission by Governors of initial designations following promulgation of new or revised standards

By such date as the Administrator may reasonably require, but not later than 1 year after promulgation of a new or revised national ambient air quality standard for any pollutant under section 7409 of this title, the Governor of each State shall (and at any other time the Governor of a State deems appropriate the Governor may) submit to the Administrator a list of all areas (or portions thereof) in the State, designating as—

(i) nonattainment, any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant,

(ii) attainment, any area (other than an area identified in clause (i)) that meets the national primary or secondary ambient air quality standard for the pollutant, or

(iii) unclassifiable, any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

illnesses that lead to emergency room visits and hospital admissions, particularly in sensitive subpopulations such as children, the elderly, and people with respiratory disease. The final rule became effective on August 23, 2010.

In issuing the new 1-hour NO₂ and SO₂ NAAQS, EPA specifically considered the exposure of sensitive subpopulations, including ones existing in the North Slope. 75 Fed. Reg. 6482 (February 9, 2010). 75 Fed. Reg. 35527 (June 22, 2010).

Shell's Supplemental Air Quality Analysis

New 1-Hour NO₂ NAAQS

In response to the EAB Orders, Shell has submitted a new air quality analysis of the anticipated air quality impacts of operations to be authorized under the 2011 Revised Draft Permits with respect to the new 1-hour NO₂ standard of 100 ppb (188 µg/m³).¹⁸ As discussed in more detail in the Region 10 Technical Support Document Review of Shell's Supplemental Ambient Air Quality Impact Analysis (Region 10 Technical Analysis), Shell used the AERMOD dispersion model with certain adjustments to account for application in a marine environment to model the impacts of the emissions proposed to be authorized under the permits. Region 10 has reviewed Shell's analysis and, as discussed in the Region 10 Technical Analysis for the 2011 Revised Draft Permits, concluded that it is consistent with EPA PSD permitting requirements.

For the background NO₂ values, Shell used monitoring data from the Badami area for the Beaufort Sea, and data from Wainwright for the Chukchi Sea. Since issuance of the 2010 Permits, Shell has installed and collected data from an additional monitoring site in the Village of Point Lay. Results of the modeling indicate the maximum modeled total impacts under the permits, including consideration of background air quality data, are 81.6 µg/m³ in the Beaufort Sea and 174.0 µg/m³ in the Chukchi Sea, less than the standard of 188 µg/m³. These maximum values were modeled 500 meters to 2000 meters (2 kilometers) from the hull of the Discoverer. The modeling is based on conservative assumptions, such as assuming the Discoverer will be located at a single drill site at the location to the closest on-shore area for the entire 120 days of operation each year, when in actuality, the Discoverer is likely to be operating at more than one drill site each season for fewer than 120 days each. This analysis shows that the 1-hour NO₂ NAAQS is expected to be attained at all areas accessible to the public, including areas both on shore and off shore where the local communities engage in subsistence activities. See Section 3.2 of the Statement of Basis.

¹⁸ The new 1-hour NO₂ standard is a probabilistic standard that is met when the 3-year average of the 98th percentile of the daily maximum 1-hour average does not exceed 100 parts per billion, which is approximately 188 µg/m³. For purposes of this analysis, unless otherwise stated, the values shown for the 1-hour NO₂ standard represent the 3-year average of the 98th percentile of the daily maximum 1-hour average expressed in µg/m³.

As discussed above and shown in Tables 5 and 6 below, maximum impacts from the Discoverer and the Associated Fleet occur 500 meters to 2000 meters (2 kilometers) from the hull of the Discover and decline rapidly from that point. Modeled impacts at communities along the Beaufort Sea are substantially lower. At Kaktovik, the modeled NO₂ concentration with the source in operation is 37.0 µg/m³, while the modeled NO₂ concentration with the source in operation at Deadhorse and Nuiqsut are 98.9 µg/m³. Note that, in the case of Deadhorse and Nuiqsut, which are both more than 50 kilometers (31 miles) from the closest lease block, the impact and total NO₂ concentration at Deadhorse and Nuiqsut is assumed to be the impact and concentration at 50 kilometers from the Discoverer in the direction of Deadhorse and Nuiqsut, because the model is designed to predict impacts to this distance. In actuality, 1-hour NO₂ emissions are expected to decline further beyond 50 kilometers and so 1-hour NO₂ emissions at Deadhorse are expected to be even lower and lower still at Nuiqsut, which is located 84 kilometers (52 miles) from the closest lease block. These modeled concentrations include monitored background concentrations, which in all cases are a significant portion of the total concentration, as shown in Table 5 below. For example, in Nuiqsut and Deadhorse, the modeled impact from Shell's operations is just 4.9 µg/m³ of NO₂ whereas 94 µg/m³ of the total modeled concentration at those locations is background levels of NO₂.

Modeled concentrations at communities along the Chukchi Sea also indicate compliance with the 1-hour NO₂ NAAQS, with values well below the standard. At Point Lay, the maximum modeled concentration with the source in operation is 52.8 µg/m³, while at Wainwright is 42.9 µg/m³. Because both of these communities are more than 50 kilometers (31 miles) from the closest location at which the Discoverer will be operating in the Chukchi Sea, the modeled impact from Shell's operations are represented by modeled impacts 50 kilometers in the direction of the communities. Actual impacts will be even lower in those communities because the communities are further away than 50 kilometers and NO₂ values are expected to decline further with distance. Thus, the 1-hour NO₂ standard will be attained in all locations beyond the 500 meter boundary and will be well below the NAAQS in the North Slope Communities and in the areas where the communities conduct subsistence activities.

Table 5 1-Hour NO₂ Modeled Impacts at Various Locations

Location	Distance from Drilling Location (km)	Shell Only Impact ² (µg/m ³)	Background Concentration ³ (µg/m ³)	Total Impacts (including background) (µg/m ³)	NAAQS (µg/m ³)	% of NAAQS
<i>Beaufort Sea</i>						
Maximum Modeled Impact	0.5	72.3	9.3	81.6	188	43%
Kaktovik	14	16	21.0	37.0	188	20%
Deadhorse (84 km from nearest lease block) ¹	50	4.9	94.0	98.9	188	53%
Nuiqsut (182 km from nearest lease block) ¹	50	4.9	94.0	98.9	188	53%
<i>Chukchi Sea</i>						
Maximum Modeled Impact	2	160.8	13.2	174.0	188	93%
Point Lay (99 km from nearest lease block) ¹	50	11.8	41.0	52.8	188	28%
Wainwright (105 km from nearest lease block) ¹	50	4.9	38.0	42.9	188	23%

¹ Modeling concentrations 50 km away in the direction of village (50 km recommended AERMOD distance limit)

² NO₂ concentrations are highest impact from Table 5 or Table 6 in ALTERNATE APPROACHES TO EVALUATING 1-HOUR NO₂ IMPACTS FOR THE SHELL DISCOVERER DRILLSHIP – NO₂ PAIRING AND NO₂/NO_x RATIOS

³ Background Concentrations at villages from June 23 memo from Chris Hall titled "EPA's Determination of Appropriate Background Values for the Chukchi Sea and Beaufort Sea OCS Permits"

Table 6 1-Hour SO₂ Modeled Impacts at Various Locations

Location	Distance from Drilling Location (km)	Shell Only Impact ² (µg/m ³)	Background Concentration ³ (µg/m ³)	Total Impacts (including background) (µg/m ³)	NAAQS (µg/m ³)	% of NAAQS
<i>Beaufort Sea</i>						
Maximum Modeled Impact	0.5	22	13.0	35.0	196	18%
Kaktovik	14	2.9	10.0	12.9	196	7%
Deadhorse (84 km from nearest lease block) ¹	50	1.4	14.0	15.4	196	8%
Nuiqsut (182 km from nearest lease block) ¹	50	1.4	14.0	15.4	196	8%
<i>Chukchi Sea</i>						
Maximum Modeled Impact	2	17.3	23.0	40.3	196	21%
Point Lay (99 km from nearest lease block) ¹	50	2.2	14.0	16.2	196	8%
Wainwright (105 km from nearest lease block) ¹	50	2.2	12.0	14.2	196	7%

¹ Modeling concentrations 50 km away in the direction of village (50 km recommended AERMOD distance limit)

² SO₂ concentrations are from Tables 3-9 and 3-10 in Discoverer Drillsip Impact Evaluation for SO₂ and NO₂ Using AERMOD Chukchi and Beaufort Seas, Shell Alaska Exploratory Drilling Program

³ Background Concentrations at villages from June 23 memo from Chris Hall titled "EPA's Determination of Appropriate Background Values for the Chukchi Sea and Beaufort Sea OCS Permits"

New 1-Hour NAAQS for SO₂

Shell has also submitted a new modeling analysis of the anticipated air quality impacts of operations with respect to the new 1-hour SO₂ NAAQS of 196 µg/m³.¹⁹ As discussed in more detail in the Region 10 Technical Analysis, even with the conservative modeling assumptions Shell used, the modeled impacts are expected to be minimal at all locations. This is because the 2011 Revised Proposed Permits will require Shell to use Ultra Low Sulfur Diesel in the Discoverer and the Associated Fleet. As shown in Table 6 above in the Beaufort Sea, the worst case modeled SO₂ impact at the 500 meter boundary assumed by Shell in its analysis is 35 µg/m³, while the modeled concentration at Kaktovik is 12.9 µg/m³ and at Deadhorse and Nuiqsut are 15.4 µg/m³, less than 10 percent of the 196 µg/m³ 1-hour SO₂ NAAQS. For the Chukchi Sea, worst case modeled concentrations beyond the 500 meter assumed boundary (at 2 kilometers) are 40.3 µg/m³, while at 50 kilometers the concentrations including background emissions in Point Lay and Wainwright are 16.2 µg/m³ and 14.2 µg/m³ respectively, both less than 10% of the standard. Again, the modeled concentrations include the worst case monitored background concentration for the areas. For both the Beaufort and Chukchi Seas, the background value is a significant portion of the modeled concentrations for all areas. Thus, the 1-hour SO₂ standard will be attained at all locations beyond the 500 meter assumed boundary and will be well below the standard in the North Slope communities and in the areas where the communities conduct subsistence activities.

Other NAAQS Standards

The 2010 Permits were supported by a demonstration that emissions from the Discoverer and the Associated Fleet would not cause or contribute to a violation of the NAAQS in effect at the time of permit issuance. The Region 10 Technical Analysis demonstrates that, although there will be some increases in emissions from certain emission units relative to the 2010 permits, overall emissions from the Discoverer and the Associated Fleet on an annual and 1-hour basis will be reduced by more than 50% for NO_x, PM₁₀, PM_{2.5}, CO, and VOC, with lesser but still substantial reductions of SO₂. There will be a slight increase in ammonia emissions (NH₃) as a result of the installation of air pollution controls for NO_x on an icebreaker, but these ammonia emissions remain low. The impact of the Discoverer and the Associated Fleet is therefore also expected to be substantially reduced under the 2011 Revised Draft Permits as compared to the 2010 Permits for the NAAQS that were in effect at the time of issuance of the 2010 Permits.

¹⁹ The new 1-hour SO₂ standard is a probabilistic standard that is met when the 3-year average of the 99th percentile of the daily maximum 1-hour average does not exceed 75 parts per billion, which is approximately 196 µg/m³. For purposes of this analysis, unless otherwise stated, the values shown for the 1-hour SO₂ standard represent the 3-year average of the 99th percentile of the daily maximum 1-hour average expressed in µg/m³.

Table 7 Maximum Modeled Impacts in the Beaufort Sea

Air Pollutant	Averaging Period	Shell Only Impacts ¹ (without background)	Background Concentration ² (µg/m ³)	Total Impact Including Background (µg/m ³)	NAAQS (µg/m ³)	Total impact as a % of NAAQS	PSD Class II Increment (µg/m ³)
NO ₂	1-hour	72.3	9.3	81.6	188	43%	NA
	Annual	2.9	1.0	3.9	100	4%	25
PM _{2.5}	24-hour	12.2	6.0	18.2	35	52%	NA
	Annual	0.5	3.0	3.5	15	23%	NA
PM ₁₀	24-hour	10.7	53.0	63.7	150	42%	30
SO ₂	1-hour	22	13.0	35.0	196	18%	NA
	3-hour	13.4	11.0	24.4	1300	2%	512
	24-hour	5.9	4.0	9.9	365	3%	91
	Annual	1.2	2.0	3.2	80	4%	20
CO	1-hour	493.9	1742.0	2235.9	40000	6%	NA
	8-hour	352.8	1094.0	1446.8	10000	14%	NA

¹ Modeled Impacts 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." May 19,2011

² Background concentrations from June 17 memo from Chris Hall titled "EPA's Determination of Appropriate Background Values for the Chukchi Sea and Beaufort Sea OCS Permits"

Table 8 Maximum Modeled Impacts in the Chukchi Sea

Air Pollutant	Averaging Period	Shell Only Impacts ¹ (without background)	Background Concentration ² (µg/m ³)	Total Impact Including Background (µg/m ³)	NAAQS (µg/m ³)	Total impact as a % of NAAQS	PSD Class II Increment (µg/m ³)
NO ₂	1-hour	160.8	13.2	174.0	188	93%	NA
	Annual	3.3	2.0	5.3	100	5%	25
PM _{2.5}	24-hour	12.4	11.0	23.4	35	67%	NA
	Annual	0.4	2.0	2.4	15	16%	NA
PM ₁₀	24-hour	11.5	79.0	90.5	150	60%	30
SO ₂	1-hour	17.3	23.0	40.3	196	21%	NA
	3-hour	13.6	14.0	27.6	1300	2%	512
	24-hour	8.1	5.0	13.1	365	4%	91
	Annual	1.4	0.4	1.8	80	2%	20
CO	1-hour	561.9	959.0	1520.9	40000	4%	NA
	8-hour	328.7	945.0	1273.7	10000	13%	NA

¹ Modeled Impacts 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." May 19,2011

² Background concentrations from June 17 memo from Chris Hall titled "EPA's Determination of Appropriate Background Values for the Chukchi Sea and Beaufort Sea OCS Permits"

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 Discover and the Associated Fleet will not cause or contribute to a violation of the ozone NAAQS for the reasons discussed in the Statements of Basis supporting the 2010 Permits. Note that the Board remanded for further consideration Region 10's conclusion that emissions of secondary PM_{2.5} (that is, PM_{2.5} formed by emissions condensing outside the stack or through chemical reactions among pollutants emitted by the source or already in the atmosphere) were adequately accounted for in Region 10's air quality analysis for PM_{2.5}. Remand Order II at 14-19. As discussed in the Region 10 Technical Analysis, Region 10 has provided additional support for this conclusion. Region 10 therefore believes that the PM_{2.5} standard will be met at all locations more than 500 meters from the Discoverer even when accounting for the possibility of the secondary formation of PM_{2.5}.

U.S. Department of Interior Environmental Justice Analysis

The U.S. Department of Interior's BOEMRE has conducted an environmental justice assessment related to oil and gas lease sales 195 and 202 within the Beaufort Sea. This analysis looked at the broader range of potential impacts from oil and gas activities. In a final Environmental Impact Statement (EIS) for these lease sales, BOEMRE stated the following impacts could occur from routine permitted activities:

Chronic disruptions to sociocultural systems likely would occur, but these disruptions are not likely to cause permanent displacement of ongoing traditional activities of harvesting, sharing, and processing subsistence resources. No "disproportionately high adverse effects" as defined by the Environmental Justice Executive Order would likely occur from planned and permitted activities associated with any of the three [lease blocks 186, 195 & 202] proposed OCS lease sales evaluated in this EIS.²⁰

BOEMRE also noted the potential impact to subsistence harvest resources but concluded that no resource or harvest area would likely become unavailable or experience an overall decrease as a result permitted activities.

In the Chukchi Sea Shell's activities under lease sale 193 were halted and remanded to BOEMRE by U.S. District Court for Alaska due to the need for further analysis. BOEMRE is currently working on a final Supplemental Environmental Impact Statement (SEIS), which is expected to be completed in the fall of 2011. Drilling authorization from BOEMRE cannot proceed until the district court issues a ruling on the SEIS.

²⁰ U.S. Department of the Interior, Materials Management Service, Beaufort Sea Planning Area, Oil and Gas Lease Sales 186, 195, and 202, Final Environmental Impact Statement, OCS EIS/EA, MMS 2003-001, at www.mms.gov/alaska/ref/EIS%20EA/BeaufortMultiSaleFEIS186_195_202/2003_001vol1.pdf.

Conclusion

As indicated above, there is a significantly high population of Alaskan Natives in the North Slope, as well as a high population of individuals that speak a language other than English at home. These characteristics combined with the health profile of residents may increase vulnerability or sensitivity to air emissions as compared to the reference populations.

Based on available information, Region 10 concludes that the activities proposed to be authorized under the 2011 Revised Draft Permits will not cause or contribute to air quality levels in excess of health-based standards for SO₂, CO, PM₁₀, PM_{2.5}, Ozone or NO₂. Region 10 therefore concludes that there will not be disproportionately high and adverse human health or environmental effects with respect to these air pollutants on minority or low-income populations residing in the North Slope, including coastal communities closest to the proposed operations. In reaching this conclusion, Region 10 considered the impact on communities while engaging in subsistence activities in areas where such activities are regularly conducted.