



AECOM
1601 Prospect Parkway
Fort Collins, Colorado 80525

970.493.8878 tel
970.493.0213 fax

May 19, 2010

Mr. Herman Wong
1200 Sixth Avenue
OEA-095
Seattle, WA 98101-1128

Subject: ConocoPhillips' Part 71 Chukchi Sea OCS Air Permit Application – Ambient Air Quality Impacts at Nearby Communities

Dear Mr. Wong,

On February 12, 2010 ConocoPhillips filed a Part 71 permit application for its planned 2010 Chukchi Sea exploration project. Consistent with the requirements of 40 CFR 51 Appendix W, Volume II of that application contained a cumulative ambient air quality impact analysis that demonstrated compliance with the NO₂, SO₂, PM₁₀, PM_{2.5}, and CO National Ambient Air Quality Standards (NAAQS) for the project impact area. Though this is the case, USEPA Region 10 has asked that the cumulative modeling domain be expanded to include model predicted impacts at the four nearest communities (Barrow, Wainwright, Point Lay, and Point Hope).

On behalf of ConocoPhillips, with this letter, I am submitting a supplement to the Part 71 application that presents the requested ambient air quality impact analysis at the four nearest communities. Also transmitted with this letter is a complete digital record of the analysis, including all supporting model input and output files.

If you have any questions please don't hesitate to contact me. As has been the case, we remain committed to working with Region 10 to resolve any issues needed to keep the review of the application moving forward.

Sincerely,

Tom Damiana
Air Quality Meteorologist
Thomas.damiana@aecom.com
970 530 3465

cc: Doug Hardesty (USEPA Region 10)
Brad Thomas (ConocoPhillips Company)
Dave Newsad (Hoefler Consulting Group)

Attach: Cumulative Impact Analysis at Nearby Communities
Electronic File Containing a Digital Record of the Submittal

Cumulative Impact Analysis at Nearby Communities

1.0 Introduction

On February 12, 2010, ConocoPhillips (CP) submitted an ambient air quality impact analysis for an exploratory drilling activity to be conducted within the Devil’s Paw Prospect on the Chukchi Sea (CP Chukchi AQIA) (Ambient Air Quality Impact Analysis for Proposed Exploratory Drilling (Devil’s Paw Prospect) in the Chukchi Sea – ConocoPhillips 2010a). That analysis contained a cumulative ambient air quality impact analysis for annual NO₂, and all averaging periods for SO₂, PM₁₀, PM_{2.5}, and CO. That analysis was supplemented with a cumulative 1-hour NO₂ ambient air quality impact analysis on April 12, 2010 (Supplemental NO₂ 1-Hour AQIA) (ConocoPhillips 2010b).

Consistent with the requirements of 40 CFR 51 Appendix W, cumulative ambient air quality impacts were predicted using a modeling domain large enough to demonstrate that the project did not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) in the project impact area. Though this is the case, USEPA Region 10 has asked that the cumulative modeling domain be expanded to include model predicted impacts at the four nearest communities. The communities, community coordinates, and distance from the project to the communities are presented in **Table 1**. **Figure 1** shows the relative location of the project and the nearby communities.

Table 1 Location of Nearby Communities

Community	Coordinates ¹					Distance to Drill Rig (km)
	Latitude	Longitude	UTME (m)	UTMN (m)	Elevation (m)	
Barrow	71.290	-156.780	793,473	7,929,760	0	326
Point Hope	68.350	-166.735	428,564	7,582,850	0	290
Wainwright	70.639	-160.029	683,765	7,844,650	0	212
Point Lay	69.743	-163.007	576,994	7,738,510	0	167

¹ WGS 84 datum used for Latitude and longitude, and UTM coordinates are zone 3N, NAD83.

An ambient air quality impact analysis has been conducted to predict cumulative impacts at the four communities listed in **Table 1**. Modeling techniques and technical approaches are fully documented in the CP Chukchi AQIA, and the Supplemental NO₂ 1-Hour AQIA. As described in

the CP Chukchi AQIA, cumulative model predicted impacts include the contribution from the Shell Gulf of Mexico Inc. (Shell) Exploratory activities.

To simplify the PM₁₀ cumulative impact analysis, impacts were predicted using the conservative techniques described in the CP Chukchi AQIA, and not refined according to the techniques described in the revised PM₁₀ cumulative impact analysis submitted to USEPA Region 10 on April 26, 2010 (AECOM 2010b).

The results of the cumulative ambient air quality impact analysis are presented separately for each community in **Tables 2** through **9**. This analysis shows that at the nearest communities, worst-case model predicted impacts from ConocoPhillips activities are below significant impact levels, and less than 5% of the measured background concentrations. Therefore, worst-case predicted cumulative impacts for SO₂, NO₂, CO, PM₁₀ and PM_{2.5} are well below their respective NAAQS.

A digital record containing all model input output files, and a spreadsheet used to conduct post-processing of model predicted impacts has been transmitted electronically with this supplemental. A README file describing the digital record is included with the digital record transmitted.

2.0 References

- AECOM Environment (AECOM). 2010a. Wainwright Near-Term Ambient Air Quality Monitoring Program Annual Data Report November 2008 through November 2009. Submitted to USEPA Region 10 April 19, 2010.
- AECOM Environment (AECOM). 2010b. ConocoPhillips' Part 71 Chukchi Sea OCS Air Permit Application – Revised PM₁₀ Cumulative Impact Analysis. Submitted to USEPA Region 10 April 26, 2010.
- ConocoPhillips. 2010a. ConocoPhillips Outer Continental Shelf Air Permit Application (Air Quality Modeling Analysis) – Chukchi Sea Devil's Paw Prospect - Volume 2. Submitted to USEPA Region 10 February 12, 2010.
- ConocoPhillips. 2010b. ConocoPhillips' Part 71 Chukchi Sea OCS Air Permit Application – Modeling Report – 1 – Hour NO₂ Ambient Air Quality Impact Analysis for Proposed Exploratory Drilling (Devil's Paw Prospect) in the Chukchi Sea. Submitted to USEPA Region 10 April 12, 2010.
- USEPA Region 10. 2010. Statement of Basis for Proposed Outer Continental Shelf Prevention of Significant Deterioration Permit No. R10OCS/PSD-AK-09-01. Frontier Discoverer Drillship – Chukchi Sea Exploration Drilling Program. Date of Proposed Permit: January 8, 2010.
- USEPA OAQPS. 2010. Modeling Procedures for Demonstrating Compliance with the PM_{2.5} NAAQS. Memorandum from Stephen D. Page (Director, Office of Air Quality Planning and Standards) to March 23, 2010.

Figure 1 Location of Receptors, CPAI and Shell Sources

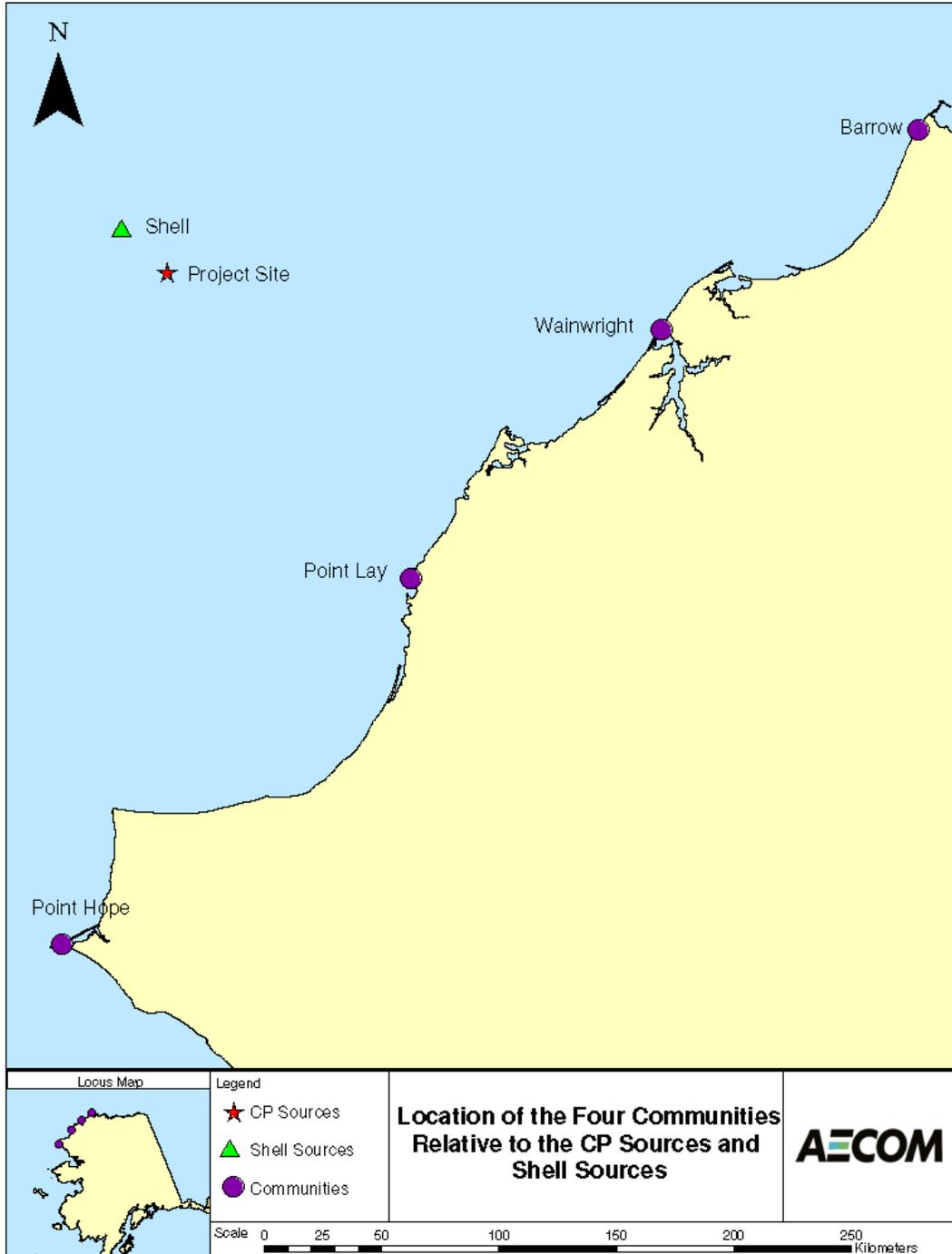


Table 2 Barrow Cumulative Impact Analysis Results (CO, NO₂, PM_{2.5}, and PM₁₀) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact	Bkgrnd. Conc. ²	Total	NAAQS
		1999	2002	2004	2005	2006				
CO	1-hr	6.4	7.3	6.3	6.9	6.5	7.3	1,050	1,057	40,000 ³
	8-hr	0.86	1.6	0.89	1.0	0.85	1.6	945	947	10,000 ³
NO ₂ ⁴	Annual	0.00	0.01	0.00	0.00	0.00	0.01	2	2	100 ⁵
	1-hr	3.9					3.9	66	70	188 ⁶
PM _{2.5}	24-hr	0.04	0.08	0.05	0.05	0.04	0.08	23	23	35 ⁷
	Annual	0.00	0.00	0.00	0.00	0.00	0.00	3	3	15 ⁵
PM ₁₀	24-hr	0.04	0.07	0.03	0.05	0.03	0.07	114	114	150 ⁸

¹ Combined model predicted impact from ConocoPhillips and Shell project sources.

² Maximum concentration measured at the Wainwright Near-Term Ambient Air Quality Monitoring Station unless otherwise stated (ConocoPhillips 2010a, AECOM 2010a).

³ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum H2H model predicted impact over 5-years and the maximum measured ambient concentration.

⁴ Annual NO₂ modeling used a 75% NO_x to NO₂ conversion according to the Ambient Ratio Method. Short-term NO₂ modeling used the Ozone Limiting Method.

⁵ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration.

⁶ Standard compared to the 3-year average of the annual 98th percentile of the daily maximum 1-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the 5-year average of the annual highest-eighth-high daily model predicted impacts and the maximum measured ambient concentration.

⁷ Standard compared to the 3-year average of the 98th percentile of the 24-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration. The extreme conservatism in this technique should account for secondary particulate formation according to recent USEPA Guidance (USEPA OAQPS 2010).

⁸ Standard compared to the highest-sixth-high predicted cumulative impact when modeling with 5 years of meteorological data. To be conservative, in this case it is the sum of the maximum highest-second-high model predicted impact over 5-years and the maximum measured ambient concentration.

Table 3 Barrow Cumulative Impact Analysis Results (SO₂) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact ²	Bkgrnd. Conc. ³	Total ⁴	NAAQS
		1999	2002	2004	2005	2006				
SO ₂	3-hr	0.01	0.01	0.01	0.01	0.01	7.8	17	25	1,300 ⁵
	24-hr	0.00	0.00	0.00	0.00	0.00	4.4	10	14	365 ⁵
	Annual	0.00	0.00	0.00	0.00	0.00	0.3	0.5	0.8	80 ⁶

¹ Model predicted impact from ConocoPhillips project sources only. The model predicted impact does not include the contribution from the Shell exploration activity because predicting cumulative impacts was not required as part of the CP Chukchi AQIA since project SO₂ impacts were less than the significant impact levels.

² The total model predicted impact includes the contribution from the Shell exploration activity. The Shell contribution to the cumulative impact is based on the maximum model predicted impact at Point Lay from Shell activities on blocks in Lease Sale 193 taken from Table 5-13 page 111 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). Point Lay was chosen because Shell impacts were predicted to be the highest at that community. The Shell contribution to the cumulative impacts are: 7.8 µg/m³ (3-hour), 4.4 µg/m³ (24-hour), and 0.3 µg/m³ (Annual).

³ Background SO₂ concentrations were not required to be determined as part of the CP Chukchi AQIA since project impacts were less than significant impact levels. Therefore, background SO₂ concentrations were taken from Table 5-11, page 108 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). These concentrations represent maximum measured concentrations.

⁴ Total represents the sum of the model predicted impact from project sources, the maximum impact from Shell sources, and the background concentration. This impact is conservative since impacts from ConocoPhillips and Shell are not paired in space or time.

⁵ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is the sum of the maximum (H2H) model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

⁶ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is the sum of the maximum model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

Table 4 Wainwright Cumulative Impact Analysis Results (CO, NO₂, PM_{2.5}, and PM₁₀) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact	Bkgrnd. Conc. ²	Total	NAAQS
		1999	2002	2004	2005	2006				
CO	1-hr	13	12	12	12	12	13	1,050	1,063	40,000 ³
	8-hr	1.6	1.7	1.6	1.6	1.6	1.7	945	947	10,000 ³
NO ₂ ⁴	Annual	0.00	0.01	0.01	0.00	0.01	0.01	2	2	100 ⁵
	1-hr	3.2					3.2	66	69	188 ⁶
PM _{2.5}	24-hr	0.11	0.19	0.10	0.10	0.06	0.19	23	23	35 ⁷
	Annual	0.00	0.00	0.00	0.00	0.00	0.00	3	3	15 ⁵
PM ₁₀	24-hr	0.05	0.06	0.06	0.06	0.05	0.06	114	114	150 ⁸

¹ Combined model predicted impact from ConocoPhillips and Shell project sources.

² Maximum concentration measured at the Wainwright Near-Term Ambient Air Quality Monitoring Station unless otherwise stated (ConocoPhillips 2010a, AECOM 2010a).

³ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum H2H model predicted impact over 5-years and the maximum measured ambient concentration.

⁴ Annual NO₂ modeling used a 75% NO_x to NO₂ conversion according to the Ambient Ratio Method. Short-term NO₂ modeling used the Ozone Limiting Method.

⁵ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration.

⁶ Standard compared to the 3-year average of the annual 98th percentile of the daily maximum 1-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the 5-year average of the annual highest-eighth-high daily model predicted impacts and the maximum measured ambient concentration.

⁷ Standard compared to the 3-year average of the 98th percentile of the 24-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration. The extreme conservatism in this technique should account for secondary particulate formation according to recent USEPA Guidance (USEPA OAQPS 2010).

⁸ Standard compared to the highest-sixth-high predicted cumulative impact when modeling with 5 years of meteorological data. To be conservative, in this case it is the sum of the maximum highest-second-high model predicted impact over 5-years and the maximum measured ambient concentration.

Table 5 Wainwright Cumulative Impact Analysis Results (SO₂) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact ²	Bkgrnd. Conc. ³	Total ⁴	NAAQS
		1999	2002	2004	2005	2006				
SO ₂	3-hr	0.01	0.01	0.01	0.01	0.01	7.8	17	25	1,300 ⁵
	24-hr	0.00	0.00	0.00	0.00	0.00	4.4	10	14	365 ⁵
	Annual	0.00	0.00	0.00	0.00	0.00	0.3	0.5	0.8	80 ⁶

¹ Model predicted impact from ConocoPhillips project sources only. The model predicted impact does not include the contribution from the Shell exploration activity because predicting cumulative impacts was not required as part of the CP Chukchi AQIA since project SO₂ impacts were less than the significant impact levels.

² The total model predicted impact includes the contribution from the Shell exploration activity. The Shell contribution to the cumulative impact is based on the maximum model predicted impact at Point Lay from Shell activities on blocks in Lease Sale 193 taken from Table 5-13 page 111 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). Point Lay was chosen because Shell impacts were predicted to be the highest at that community. The Shell contribution to the cumulative impacts are: 7.8 µg/m³ (3-hour), 4.4 µg/m³ (24-hour), and 0.3 µg/m³ (Annual).

³ Background SO₂ concentrations were not required to be determined as part of the CP Chukchi AQIA since project impacts were less than significant impact levels. Therefore, background SO₂ concentrations were taken from Table 5-11, page 108 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). These concentrations represent maximum measured concentrations.

⁴ Total represents the sum of the model predicted impact from project sources, the maximum impact from Shell sources, and the background concentration. This impact is conservative since impacts from ConocoPhillips and Shell are not paired in space or time.

⁵ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is the sum of the maximum (H2H) model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

⁶ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is the sum of the maximum model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

Table 6 Point Lay Cumulative Impact Analysis Results (CO, NO₂, PM_{2.5}, and PM₁₀) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact	Bkgrnd. Conc. ²	Total	NAAQS
		1999	2002	2004	2005	2006				
CO	1-hr	4.8	5.6	5.3	5.6	5.9	5.9	1,050	1,056	40,000 ³
	8-hr	1.1	1.1	1.7	0.78	1.3	1.7	945	947	10,000 ³
NO ₂ ⁴	Annual	0.01	0.01	0.01	0.00	0.01	0.01	2	2	100 ⁵
	1-hr	5.8					5.8	66	72	188 ⁶
PM _{2.5}	24-hr	0.07	0.07	0.07	0.09	0.05	0.09	23	23	35 ⁷
	Annual	0.00	0.00	0.00	0.00	0.00	0.00	3	3	15 ⁵
PM ₁₀	24-hr	0.04	0.05	0.06	0.03	0.04	0.06	114	114	150 ⁸

¹ Combined model predicted impact from ConocoPhillips and Shell project sources.

² Maximum concentration measured at the Wainwright Near-Term Ambient Air Quality Monitoring Station unless otherwise stated (ConocoPhillips 2010a, AECOM 2010a).

³ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum H2H model predicted impact over 5-years and the maximum measured ambient concentration.

⁴ Annual NO₂ modeling used a 75% NO_x to NO₂ conversion according to the Ambient Ratio Method. Short-term NO₂ modeling used the Ozone Limiting Method.

⁵ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration.

⁶ Standard compared to the 3-year average of the annual 98th percentile of the daily maximum 1-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the 5-year average of the annual highest-eighth-high daily model predicted impacts and the maximum measured ambient concentration.

⁷ Standard compared to the 3-year average of the 98th percentile of the 24-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration. The extreme conservatism in this technique should account for secondary particulate formation according to recent USEPA Guidance (USEPA OAQPS 2010).

⁸ Standard compared to the highest-sixth-high predicted cumulative impact when modeling with 5 years of meteorological data. To be conservative, in this case it is the sum of the maximum highest-second-high model predicted impact over 5-years and the maximum measured ambient concentration.

Table 7 Point Lay Cumulative Impact Analysis Results (SO₂) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact ²	Bkgrnd. Conc. ³	Total ⁴	NAAQS
		1999	2002	2004	2005	2006				
SO ₂	3-hr	0.01	0.01	0.01	0.01	0.01	7.8	17	25	1,300 ⁵
	24-hr	0.00	0.00	0.00	0.00	0.00	4.4	10	14	365 ⁵
	Annual	0.00	0.00	0.00	0.00	0.00	0.3	0.5	0.8	80 ⁶

¹ Model predicted impact from ConocoPhillips project sources only. The model predicted impact does not include the contribution from the Shell exploration activity because predicting cumulative impacts was not required as part of the CP Chukchi AQIA since project SO₂ impacts were less than the significant impact levels.

² The total model predicted impact includes the contribution from the Shell exploration activity. The Shell contribution to the cumulative impact is based on the maximum model predicted impact at Point Lay from Shell activities on blocks in Lease Sale 193 taken from Table 5-13 page 111 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). Point Lay was chosen because Shell impacts were predicted to be the highest at that community. The Shell contribution to the cumulative impacts are: 7.8 µg/m³ (3-hour), 4.4 µg/m³ (24-hour), and 0.3 µg/m³ (Annual).

³ Background SO₂ concentrations were not required to be determined as part of the CP Chukchi AQIA since project impacts were less than significant impact levels. Therefore, background SO₂ concentrations were taken from Table 5-11, page 108 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). These concentrations represent maximum measured concentrations.

⁴ Total represents the sum of the model predicted impact from project sources, the maximum impact from Shell sources, and the background concentration. This impact is conservative since impacts from ConocoPhillips and Shell are not paired in space or time.

⁵ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is the sum of the maximum (H2H) model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

⁶ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is the sum of the maximum model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

Table 8 Point Hope Cumulative Impact Analysis Results (CO, NO₂, PM_{2.5}, and PM₁₀) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact	Bkgrnd. Conc. ²	Total	NAAQS
		1999	2002	2004	2005	2006				
CO	1-hr	4.1	4.4	4.9	2.2	3.8	4.9	1,050	1,055	40,000 ³
	8-hr	0.6	0.7	0.6	0.4	0.6	0.7	945	946	10,000 ³
NO ₂ ⁴	Annual	0.01	0.01	0.01	0.00	0.01	0.01	2	2	100 ⁵
	1-hr	3.3					3.3	66	69	188 ⁶
PM _{2.5}	24-hr	0.03	0.05	0.05	0.03	0.05	0.05	23	23	35 ⁷
	Annual	0.00	0.00	0.00	0.00	0.00	0.00	3	3	15 ⁵
PM ₁₀	24-hr	0.03	0.03	0.02	0.02	0.04	0.04	114	114	150 ⁸

¹ Combined model predicted impact from ConocoPhillips and Shell project sources.

² Maximum concentration measured at the Wainwright Near-Term Ambient Air Quality Monitoring Station unless otherwise stated (ConocoPhillips 2010a, AECOM 2010a).

³ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum H2H model predicted impact over 5-years and the maximum measured ambient concentration.

⁴ Annual NO₂ modeling used a 75% NO_x to NO₂ conversion according to the Ambient Ratio Method. Short-term NO₂ modeling used the Ozone Limiting Method.

⁵ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration.

⁶ Standard compared to the 3-year average of the annual 98th percentile of the daily maximum 1-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the 5-year average of the annual highest-eighth-high daily model predicted impacts and the maximum measured ambient concentration.

⁷ Standard compared to the 3-year average of the 98th percentile of the 24-hour predicted cumulative impacts. To be conservative, in this case it is compared to the sum of the maximum model predicted impact over 5-years and the maximum measured ambient concentration. The extreme conservatism in this technique should account for secondary particulate formation according to recent USEPA Guidance (USEPA OAQPS 2010).

⁸ Standard compared to the highest-sixth-high predicted cumulative impact when modeling with 5 years of meteorological data. To be conservative, in this case it is the sum of the maximum highest-second-high model predicted impact over 5-years and the maximum measured ambient concentration.

Table 9 Point Hope Cumulative Impact Analysis Results (SO₂) (Concentrations in µg/m³)

Pollutant	Avg. Period	Impacts Predicted with Wainwright NWS Meteorological Data ¹					Model Predicted Impact ²	Bkgrnd. Conc. ³	Total ⁴	NAAQS
		1999	2002	2004	2005	2006				
SO ₂	3-hr	0.01	0.01	0.01	0.00	0.01	7.8	17	25	1,300 ⁵
	24-hr	0.00	0.00	0.00	0.00	0.00	4.4	10	14	365 ⁵
	Annual	0.00	0.00	0.00	0.00	0.00	0.3	0.5	0.8	80 ⁶

¹ Model predicted impact from ConocoPhillips project sources only. The model predicted impact does not include the contribution from the Shell exploration activity because predicting cumulative impacts was not required as part of the CP Chukchi AQIA since project SO₂ impacts were less than the significant impact levels.

² The total model predicted impact includes the contribution from the Shell exploration activity. The Shell contribution to the cumulative impact is based on the maximum model predicted impact at Point Lay from Shell activities on blocks in Lease Sale 193 taken from Table 5-13 page 111 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). Point Lay was chosen because Shell impacts were predicted to be the highest at that community. The Shell contribution to the cumulative impacts are: 7.8 µg/m³ (3-hour), 4.4 µg/m³ (24-hour), and 0.3 µg/m³ (Annual).

³ Background SO₂ concentrations were not required to be determined as part of the CP Chukchi AQIA since project impacts were less than significant impact levels. Therefore, background SO₂ concentrations were taken from Table 5-11, page 108 of the Statement of Basis for Permit No. R10OCS/PSD-AK-09-01 (USEPA Region 10 2010). These concentrations represent maximum measured concentrations.

⁴ Total represents the sum of the model predicted impact from project sources, the maximum impact from Shell sources, and the background concentration. This impact is conservative since impacts from ConocoPhillips and Shell are not paired in space or time.

⁵ Standard compared to the highest-second-high (H2H) predicted cumulative impact. To be conservative, in this case it is the sum of the maximum (H2H) model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.

⁶ Standard compared to the maximum predicted cumulative impact. To be conservative, in this case it is the sum of the maximum model predicted impact over 5-years from project sources, the maximum impact from Shell sources, and the maximum measured ambient concentration.