Robin Glover
Env. Coord. - GKA Air Quality

ConocoPhillips Alaska, Inc.
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May 3, 2021

Submitted Electronically

Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
dec.aq.airreports@alaska.gov

Subject: ConocoPhillips Alaska, Inc. Kuparuk Central Production Facility #1 Permit Application to Increase H_2S Limits in Title I Construction Permit No. 9773-AC016 Revision 1 (AQ0267CPT04), Construction Permit No. AQ0267CP01, and Minor Permit No. AQ0267MSS06

Dear Permit Intake Clerk:

ConocoPhillips Alaska, Inc. (CPAI) has enclosed with this letter an application to increase gaseous fuel hydrogen sulfide (H_2S) content limits established in the Greater Kuparuk Area Central Production Facility #1 (CPF-1) Title I PSD Air Quality Construction Permit No. 9773-AC016 Revision 1 (AQ0267CPT04), Title I Air Quality Construction Permit No. AQ0267CP01, and Title I Air Quality Control Minor Permit No. AQ0267MSS06. With this application, CPAI is requesting that gaseous fuel H_2S content limits to protect ambient ait quality be increased to no more than 300 parts per million by volume (ppmv) for gaseous fuel combusted by the production facility equipment and to no more than 500 ppmv for gaseous fuel combusted by drill site equipment for additional operational flexibility. In conjunction with these changes, CPAI is also requesting several updates to Minor Permit No. AQ0267MSS06 for permit hygiene.

This application is being submitted under the following minor permit classifications:

- 18 AAC 50.502(c)(3) – A minor modification of a stationary source with an existing potential-to-emit (PTE) greater than 40 tons per year (tpy) of sulfur dioxide (SO_2) and increase in PTE of greater than 10 tpy SO_2; and
- 18 AAC 50.508(6) – An application to revise or rescind Title I permit terms and conditions.

This application includes all the information required under 18 AAC 50.540 for each of these permit classifications. Based on a regulatory review, CPAI believes that the requested revisions do not trigger review under Prevention of Significant Deterioration (PSD) rules and has included information supporting this determination in this application. Once the requested Title I permit revisions are finalized, CPAI will submit a separate request to ADEC to incorporate the revisions made through this application into the CPF-1 Title V operating permit or renewal application, at a later time.

We appreciate the Department's timely processing of this submittal. We also understand that CPAI will pay an hourly permit administrative fee for the regulatory services associated with our permit application requests. If you have any questions or require additional information, please contact me at (907) 263-4874 or robin.glover@conocophillips.com.

Sincerely,

Robin Glover
Environmental Coordinator – Greater Kuparuk Area Air Quality

Cc: US EPA Region 10

Electronic cc: Patrick Dunn (ADEC), Yesenia Camarena (ADEC)

Enclosures:
Attachment A – Stationary Source Identification Form
Attachment B – Emission Unit Information Form
Attachment C – Emission Summary for Modification Form
Attachment D – State Emission Standards Compliance Demonstration
Attachment E – Ambient Air Quality Impact Analysis (AQIA)
Attachment F – Copy of Construction Permit No. 9773-AC016 Revision 1 (AQ0267CPT04)
Copy of Construction Permit No. AQ0267CP01
Copy of Minor Permit No. AQ0267MSS06
Attachment G – Emissions Calculations (enclosed electronically)
Attachment H – Modeling Files (enclosed electronically)

Attachment A

Stationary Source Identification Form

Alaska Department of Environmental Conservation
Air Quality Minor Permit Application

STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Name: Central Production Facility #1 (CPF-1)			SIC: 1311
Project Name (if different): H_2S Limits Increase	Contact: Randy Roberts/Denise Titus		
Physical Address: Kuparuk Oil Field, Section 9, Township 11N, Range 10E (Production Pad)	City: N/A	State: AK	Zip: N/A
	Telephone: (907) 659-7727		
	E-Mail Address: n2073@conocophillips.com		
UTM Coordinates (m) or Latitude/Longitude:	Northing: N/A	Easting: N/A	Zone: 6
	Latitude: 70° 19' 24" N	Longitude: 149° 36' 30" W	

Section 2 Legal Owner

Name: See **Page 19** of this form		
Mailing Address:		
City:	State:	Zip:
Telephone #:		
E-Mail Address:		

Section 3 Operator *(if different from owner)*

Name: ConocoPhillips Alaska, Inc. (CPAI)		
Mailing Address: P.O. Box 100360		
City: Anchorage	State: AK	Zip: 99510-0360
Telephone #: N/A		
E-Mail Address: N/A		

Section 4 Designated Agent *(for service of process)*

Name: CT Corporation System		
Mailing Address: 9360 Glacier Highway, Suite 202		
City: Juneau	State: AK	Zip: 99801
Telephone #: (907) 586-3340		
E-Mail Address: N/A		

Section 5 Billing Contact Person *(if different from owner)*

Name: Robin Glover		
Mailing Address: P.O. Box 100360		
City: Anchorage	State: AK	Zip: 99510-0360
Telephone #: (907) 263-4874		
E-Mail Address: Robin.Glover@conocophillips.com		

Section 6 Application Contact

Name: Same as **Billing Contact Person**			
Mailing Address:	City:	State:	Zip:
	Telephone:		
	E-Mail Address:		

Section 7 Desired Process Method *(Check only one – see 18 AAC 50.542(a) for process descriptions and restrictions)*

☐ Fast track for a permit classification under 18 AAC 50.502 [18 AAC 50.542(b)]

☒ Public comment [18 AAC 50.542(d)]

Section 8 Source Classification(s) *(Check all that apply)*
[18 AAC 50.502(b)]

- ☐ Asphalt Plant [≥ 5 ton per hour]
- ☐ Thermal Soil Remediation Unit [≥ 5 ton per hour]
- ☐ Rock Crusher [≥ 5 ton per hour]
- ☒ Incinerator(s) [total rated capacity ≥ 1000 lb/hour]
- ☐ Coal Preparation Plant
- ☐ Port of Anchorage Facility

If you checked any of the above, is (are) the emission unit(s) ☐ new, ☐ relocated*, or ☒ existing?

[18 AAC 50.502(c)(1)]
New or relocated* stationary source with potential emissions greater than:

- ☐ 40 tons per year (tpy) NOx
- ☐ 40 tpy SO_2
- ☐ 15 tpy PM-10
- ☐ 10 tpy PM-2.5
- ☐ 0.6 tpy lead
- ☐ 100 tpy CO in a nonattainment area

[18 AAC 50.502(c)(2)]
Construction or relocation* of a:

- ☐ Portable oil and gas operation
- ☐ ≥ 10 MMBtu/hr fuel burning equipment in a SO_2 special protection area

* *Relocation does NOT include moving equipment from one place to another within your current stationary source boundary.*

Section 9 Modification Classification(s) (*Check all that apply)*

[18 AAC 50.502(c)(3)]

☐	NOx Increase > 10 tpy	[and existing PTE > 40 tpy]
☒	SO_2 Increase > 10 tpy	[and existing PTE > 40 tpy]
☐	PM-10 Increase > 10 tpy	[and existing PTE > 15 tpy]
☐	PM-2.5 Increase > 10 tpy	[and existing PTE > 10 tpy]
☐	CO Increase > 100 tpy	[and existing PTE > 100 tpy in a nonattainment area]

[18 AAC 50.502(c)(4)]

☐	NOx Increase > 40 tpy	[and existing PTE ≤ 40 tpy]
☐	SO_2 Increase > 40 tpy	[and existing PTE ≤ 40 tpy]
☐	PM-10 Increase > 15 tpy	[and existing PTE ≤ 15 tpy]
☐	PM-2.5 Increase > 10 tpy	[and existing PTE ≤ 10 tpy]
☐	CO Increase > 100 tpy	[and Existing PTE ≤ 100 tpy in a nonattainment area]

Basis for calculating modification:

- ☐ Projected actual emissions minus baseline actual emissions
- ☒ New potential emissions minus existing potential emissions

Section 10 Permit Action Request (*Check all that apply)*

[18 AAC 50.508]

- ☐ Establish Plant-wide Applicability Limitation (PAL)
- ☐ Establish emission reductions to offset nonattainment pollutant
- ☐ Owner Requested Limit* (ORL)
- ☒ Revise or Rescind Title I Permit Conditions *

Permit Number: **AQ0267MSS06** Date: **03/28/14**
Permit Number: **9773-AC016, Revision 1 (AQ0267CPT04)** Date: **06/27/01**
Permit Number: **AQ0267CP01** Date: **04/28/03**

**Which to use? See* http://www.dec.state.ak.us/air/ap/docs/orlrtc.pdf

Section 11 Existing Permits and Limits

For an existing stationary source, do you have an existing:
(Check all that apply)

☒ Air quality permit Number(s)*: PSD-X82-01
AQ0267CP01
9773-AC016, Revision 1 (AQ0267CPT04)
AQ0267MSS05
AQ0267MSS06
AQ0267MSS07
AQ0267TVP01, Revision 4

- ☐ Owner Requested Limit(s) Permit Number(s):
- ☐ Pre-Approved Emission Limit (PAEL) Number(s)**:

** All active construction, Title V, and minor permit numbers.*
***Optional. Please provide this number if possible.*
http://dec.alaska.gov/Applications/Air/airtoolsweb/

Section 12 Project Description

Provide a short narrative describing the project. Discuss the purpose for conducting this project, what emission units/activities will be added/modified under this project (i.e., project scope), and the project timeline. If the project is a modification to an existing stationary source, describe how this project will affect the existing process. Include any other discussion that may assist the Department in understanding your project or processing your application. Include a schedule of construction.

Please use additional copies of this sheet if necessary.

Overview of the Project Description

- **Summary of Project and Request**
  - *Request to Increase H_2S Limits*
  - *Request for Permit Hygiene*
  - *Request to Consolidate Permit Revisions and Permit Administration*
- **Permitting History and Basis for H_2S Limits and Requested Revisions**
  - *200 ppmv (annual average) H_2S Limit (EU IDs 1-13, 15, 29-33, 35, 37-40, 43-45, 48, and 49)*
  - *200 ppmv (24-hour average) H_2S Limit (EU IDs 14 and 17)*
  - *162 ppmv (3-hour average) H_2S Limit (EU ID 16)*
  - *275 ppmv (at any time) H_2S Limit (EU IDs 42, 46, and 47)*
- **PSD Applicability Determination**
  - *Baseline Actual Emissions*
  - *Projected Actual Emissions*
- **Review of Project Regulatory Applicability and Requirements**
  - *Permit Classifications*
  - *Other Regulatory Requirements*
  - *Application Requirements*

Summary of Project and Request

ConocoPhillips Alaska, Inc. (CPAI) is submitting this application under 18 Alaska Administrative Code (AAC) 50.502(c)(3) and 18 AAC 50.508(6) to revise Kuparuk River Unit Central Production Facility #1 (CPF-1) Air Quality Construction Permit No. 9773-AC016, Revision 1, Air Quality Control Construction Permit No. AQ0267CP01, and Air Quality Control Minor Permit No. AQ0267MSS06. CPAI's objective for revising these permits is to increase gaseous fuel hydrogen sulfide (H_2S) parts per million by volume (ppmv) limits at CPF-1 for additional operational flexibility and to request revisions for permit hygiene.

CPF-1 is a Prevention of Significant Deterioration (PSD) major stationary source located on the Alaskan North Slope and is one of three central production facilities owned and operated by CPAI in the Kuparuk River Unit. The CPF-1 emission unit (EU) inventory includes gas-fired turbines and heaters, diesel-fired emergency equipment, emergency and process control flares, an incinerator, tanks, as well as emission units at aggregated remote drill sites such as production heaters and engine-driven freeze protection pumps. CPAI is currently operating the CPF-1 under the following permits:

- U.S. Environmental Protection Agency (USEPA) PSD Permit No. PSD-X82-01 (issued December 29, 1981; terms and conditions incorporated into current operating permit)
- Alaska Department of Environmental Conservation (ADEC) PSD Air Quality Construction Permit No. 9773-AC016, Revision 1 (now assumed to be known as Title I Air Quality Control Construction Permit No. AQ0267CPT04; issued June 27, 2001; no expiration)
- ADEC Title I Air Quality Construction Permit No. AQ0267CP01 (issued April 28, 2003; no expiration)
- ADEC Title I Air Quality Control Minor Permit No. AQ0267MSS05 (issued August 5, 2013; no expiration)
- ADEC Title I Air Quality Control Minor Permit No. AQ0267MSS06 (issued March 28, 2014; no expiration)
- ADEC Title I Air Quality Control Minor Permit No. AQ0267MSS07 (issued October 31, 2014; no expiration)
- ADEC Title V Operating Permit AQ0267TVP01, Revision 4 (operating under the "Timely and Complete Application as Shield" provisions in Alaska Statutes (AS) 46.14.275)

Request to Increase H_2S Limits

CPAI has been monitoring the rising H_2S content of gas produced to its Kuparuk production facilities and combusted by facility equipment and has identified that additional short-term operational flexibility with respect to allowable H_2S concentrations in the gaseous fuel is important to maintaining compliance with H_2S limits in active CPF-1 construction and operating permits. In addition to permit revisions, CPAI is exploring and implementing additional long-term operational strategies to maintain compliance with construction and operating permit requirements.

With this application, CPAI is requesting to revise gaseous fuel H_2S limits in CPF-1 Construction Permit No. 9773-AC016 Revision 1 (AQ0267CPT04), Construction Permit No. AQ0267CP01, and Minor Permit No. AQ0267MSS06. The existing H_2S limits that CPAI is requesting to revise and the proposed limits are described in **Table 1**. As part of these permit actions, CPAI is not requesting any changes to Best Available Control Technology (BACT) emission limits, nor any changes that would impact PSD avoidance, as applicable. Therefore, the requested changes are not subject to PSD review. It is important to note that increasing gaseous fuel H_2S assumptions does not imply a change to or directly threaten compliance with any annual SO_2 BACT or PSD avoidance emission limitations because actual SO_2 emissions are a function of both the volume of gaseous fuel combusted and the concentration of H_2S in the gas stream. Therefore, there are many operational scenarios that would allow compliance with these annual emission limits based on different levels of H_2S concentrations and amount of gaseous fuel combusted.

Table 1 Requested Revisions to CPF-1 Gaseous Fuel H_2S Limits

<table>
<tr><th>Applicable EUs</th><th>Current Ambient Air Quality Protection Limit</th><th>Basis for H_2S Limits</th><th>Requested Revision to Ambient Limit</th></tr>
<tr><td>EU IDs 1-13, 15, 29-33, and 35
(GE Frame 3 Gas Lift Compressors, Ruston TB5000s, Ruston TB5400s, Broach Heater, Flares, and Comptro Incinerator)</td><td>200 ppmv H_2S in gaseous fuel (annual average)</td><td>• Ambient air quality protection limit only
• Established in Air Quality Control Permit to Operate No. 9373-AA004 (05/11/93)
• Carried forward to <u>Air Quality Construction Permit No. AQ0267CP01</u> (04/28/03)</td><td rowspan="3">300 ppmv H_2S in gaseous fuel (annual average)</td></tr>
<tr><td>EU IDs 14 and 17
(GE Frame 6 Turbine and Kvaerner Heater)</td><td>200 ppmv H_2S in gaseous fuel (24-hr average)</td><td>• Ambient air quality protection and BACT limit
• Established in Air Quality Construction Permit No. 9773-AC016 (02/13/98)
• Carried forward to <u>Air Quality Construction Permit No. 9773-AC016, Revision 1 (AQ0267CPT04)</u> (06/27/01)
• Carried forward to <u>Air Quality Construction Permit No. AQ0267CP01</u> (04/28/03)</td></tr>
<tr><td>EU ID 16
(Born Heater)</td><td>230 milligrams H_2S per dscm [0.10 gr/dscf; 162 ppmv H_2S at 59°F (3-hour average)]</td><td>• Ambient air quality protection and NSPS (40 CFR 60 Subpart J) limit
• Established in Air Quality Control Permit to Operate No. 9373-AA004 (05/11/93)
• Carried forward to <u>Air Quality Construction Permit No. AQ0267CP01</u> (04/28/03)</td></tr>
<tr><td>EU IDs 37-40, 43-45, 48, and 49
(Drill Site Heaters)</td><td>200 ppmv H_2S in gaseous fuel (annual average)</td><td>• Ambient air quality protection limit only
• Established in Air Quality Control Permit to Operate No. 9373-AA004 (05/11/93)
• Carried forward to <u>Air Quality Construction Permit No. AQ0267CP01</u> (04/28/03)</td><td rowspan="2">500 ppmv H_2S in gaseous fuel (annual average)</td></tr>
<tr><td>EU IDs 42, 46, and 47
(Drill Sites 1E & 1J Heaters)</td><td>275 ppmv H_2S in gaseous fuel (at any time)</td><td>• Ambient air quality protection and PSD avoidance limit
• Established in Air Quality Control Minor Permit No. AQ0267MSS01 (08/05/05)
• Carried forward to <u>Air Quality Control Minor Permit No. AQ0267MSS06</u> (03/28/14)</td></tr>
</table>

While CPAI recognizes that the H_2S content of the gaseous fuel combusted by some emission units will still be restricted by applicable BACT or NSPS related to gaseous fuel H_2S content or SO_2 emissions, CPAI is seeking to consolidate and simplify the ambient air quality protection limits based on gaseous fuel H_2S content. Therefore, CPAI is requesting a 300 ppmv H_2S ambient air protection limit on the gaseous fuel combusted by all emission units at the production facility (EU IDs 1 through 17, 29 through 33, and 35) and a 500 ppmv H_2S ambient air protection limit on the gaseous fuel combusted by all emission units at the aggregated drill sites (EU IDs 37 through 40 and 42 through 49). An updated ambient demonstration is included with this application based the revised ambient limits. The current permits to which the existing H_2S ambient limits were carried forward (indicated in **bold**) in **Table 1** are the Title I permits that CPAI is requesting revisions to under 18 AAC 50.502(c)(3) and 18 AAC 50.508(6) to make these changes to the H_2S limits.

Because CPAI has already established gaseous fuel H_2S limits for all EUs in **Table 1**, CPAI expects to comply with the proposed limits by continuing to use the same monitoring, recordkeeping, and reporting (MR&R) requirements already established in current permits.

Request for Permit Hygiene

CPAI is also requesting revisions for permit hygiene to Minor Permit No. AQ0267MSS06 now that the emissions unit inventory is finalized. CPAI is requesting that the emission unit inventory and the PSD avoidance limits in Permit No. AQ0267MSS06 are revised to reflect the installed equipment inventory associated with Drill Sites 1E and 1J, which consists of the following:

- EU ID 42: GTS Energy Production Heater (1E), 30.0 MMBtu/hr [heat input, LHV]
- EU ID 46: Petrochem Development Production Heater (1J), 36.8 MMBtu/hr [heat input, LHV]
- EU ID 47: Petrochem Development Production Heater (1J), 36.8 MMBtu/hr [heat input, LHV]

CPAI has assessed the maximum potential emissions and operations of this equipment inventory. Based on this assessment, CPAI identified that the PSD avoidance limits in Conditions 4, 5, and 6 are unnecessary to avoid a PSD permit classification and is requesting those limits and associated MR&R are removed. **Table 2** summarizes CPAI’s evaluation of the need for these PSD avoidance limits in Minor Permit No. AQ0267MSS06.

Table 2 Evaluation of the Need for PSD Avoidance Limits in Minor Permit No. AQ0267MSS06

Minor Permit No. AQ0267MSS06 Condition Number	PSD Avoidance Limit	Evaluation
Condition 4	184 MMBtu/hr [heat input, HHV]	The maximum combined heat input of the Drill Site 1E and 1J production heaters is 103.6 MMBtu/hr [heat input, LHV] or 114.4 MMBtu/hr [heat input, HHV]. Because the maximum heat input of the production heaters is well below 184 MMBtu/hr [heat input, HHV], this limit is unnecessary to avoid PSD.
Condition 5	275 ppmv H_2S content in fuel gas	Because SO_2 emissions are a function of both H_2S content in the gaseous fuel combusted and the volume of gas combusted, this limit is not necessary to limit SO_2 emissions to avoid PSD, regardless of any other changes requested.
Condition 6	35 tpy SO_2	The maximum potential SO_2 emissions from the Drill Site 1E and 1J production heaters, considering an increased fuel gas H_2S content of 500 ppmv and 8,760 hr/yr of operations, is 34.8 tpy. Because the maximum potential emissions are less than 35 tpy SO_2, this limit is unnecessary to avoid PSD.

CPAI has recalculated the CPF-1 stationary source PTE to reflect the current Drill Sites 1E and 1J equipment inventory and based on the removal of the PSD avoidance limits in Conditions 4, 5, and 6. These revisions result in a net decrease in the PTE for all regulated pollutants for EU IDs 42, 46, and 47, which has been summarized in **Attachment C** with this application.

Request to Consolidate Permit Revisions and Permit Administration

To consolidate the various changes to the CPF-1 permits, CPAI requests that the permit actions result in one new minor permit. CPAI also requests that this new consolidated minor permit incorporates the remaining terms and conditions in Minor Permit No. AQ0267MSS06 and subsequently rescinds Minor Permit No. AQ0267MSS06. After these Title I permit changes are finalized, CPAI will submit a separate request to ADEC to incorporate the revisions made through this application into the CPF-1 Title V operating permit or renewal application.

Permitting History and Basis for H_2S Limits and Requested Revisions

Given the long history of source permits including various gaseous fuel H_2S limits for CPF-1 EUs, the following narrative provides additional explanation of the basis for each of the H_2S limits listed in **Table 1** that CPAI is requesting to revise through this application.

200 ppmv (annual average) H_2S Limit (EU IDs 1-13, 15, 29-33, 35, 37-40, 43-45, 48, and 49)

Similar to the other production facilities in the Kuparuk River Unit, this 200 ppmv H_2S limit was originally established as an ambient air quality protection limit through an Air Quality Control Permit to Operate in the early 1990s in response to field gas souring. The CPF-1 Air Quality Control Permit to Operate No. 9373-AA004 and associated Technical Analysis Report (TAR) (both dated 05/11/93) clearly document ADEC's determination that the increase in the H_2S limit did not require PSD review because the field gas souring was, at that time, not considered a physical change or a change in the method of operations. However, ADEC also concluded that field gas souring was increment consuming and the changes to SO_2 emissions would require an updated ambient demonstration to demonstrate compliance with the ambient air quality standards and increments. Thus, the 200 ppmv H_2S limit was established as an operational limit based on the ambient demonstration supporting Air Quality Control Permit to Operate No. 9373-AA004 (Exhibit B). This limit has been carried forward into both Construction Permit No. AQ0267CP01 (Exhibit B) and Operating Permit No. AQ0267TVP01, Revision 4 (Condition 12). Based on this, CPAI believes that this 200 ppmv H_2S limit is an ambient air quality protection limit and can be revised by providing an updated ambient demonstration with emissions based on the proposed H_2S limits in **Table 1** of 300 ppmv for EUs at the production facility and 500 ppmv for EUs at aggregated drill sites.

However, Exhibit B of Construction Permit No. AQ0267CP01 also indicates the basis of the 200 ppmv H_2S limit as "Carried forward. EPA PSD BACT and 10/7/97 permit revision" for EU IDs 1 through 3 and 8 through 13. The H_2S limits for all other EUs identified are not explained as BACT limits in Construction Permit No. AQ0267CP01. Based on the historical permitting reviewed, CPAI does not believe that the 200 ppmv H_2S limit is a BACT limit for any of these EUs. The 200 ppmv H_2S limit was documented as resulting from the ambient demonstration supporting Air Quality Control Permit to Operate No. 9373-AA004 (05/11/93). For this permit, the H_2S limit was used as a basis (underlying assumption) to reestablish and increase the SO_2 tpy BACT emission limits established for EUs 1 through 3 and 8 through 13, but it was never implemented as a BACT limit itself. This is similarly supported by the fact that the current operating permit (Operating Permit No. AQ0267TVP01, Revision 4) only includes BACT implemented as annual SO_2 (tons per year) limits and does not include any short-term or long-term H_2S BACT limits for these EUs. Therefore, CPAI believes that the explanation provided in Exhibit B of Construction Permit No. AQ0267CP01 referring to this limit as "Carried forward. EPA PSD BACT and 10/7/97 permit revision" for EU IDs 1 through 3 and 8 through 13 is incorrect and is requesting this reference be updated with this permit application. Also note that this is the same conclusion reached by ADEC and CPAI when revising the same H_2S limit for the Kuparuk Central Production Facility #3 (CPF-3), in support of Minor Permit No. AQ0171MSS02 (now under Minor Permit No. AQ0171MSS03). CPAI is not requesting any changes to SO_2 tpy BACT limits established for any of the EU IDs referenced and will continue to operate in compliance with applicable annual SO_2 BACT limits.

200 ppmv (24-hour average) H_2S Limit (EU IDs 14 and 17)

This 200 ppmv H_2S limit was established for EU IDs 14 and 17 in Air Quality Construction Permit No. 9773-AC016 (02/13/98) as an ambient air quality protection limit in Condition V.A.3. and as a BACT limit in Condition IX.A.2. These limits have been carried forward into Construction Permit No. AQ0267CP01 (Exhibit B), Construction Permit No. 9773-AC016 Revision 1 (Conditions V.A.3. and IX.A.2.) (now assumed to be known as AQ0267CPT04), and Operating Permit No. AQ0267TVP01, Revision 4 (Conditions 12b and 9.3a [Table 5]). Based on this understanding of the limit, CPAI is requesting a revised gaseous fuel H_2S limit of 300 ppmv to protect ambient air quality with this permit application for consistency with the ambient limit requested for all other EUs at the production facility. This will require an updated ambient demonstration and revisions to both Construction Permit No. AQ0267CP01 (Exhibit B) and Construction Permit No. 9773-AC016, Revision 1 (Condition V.A.3.) (AQ0267CPT04). CPAI is not requesting a change to the BACT limit established and understands that the H_2S content of gaseous fuel combusted by EU IDs 14 and 17 will still be restricted to the lower limit of 200 ppmv H_2S, which is also used as the basis for the potential-to-emit (PTE).

162 ppmv (3-hour average) H_2S Limit (EU ID 16)

The 162 ppmv H_2S limit is based on requirements specifically applicable to EU ID 16 in 40 CFR 60 Subpart J (Standards of Performance for Petroleum Refineries). At least as early as the issuance of Permit to Operate No. 9373-AA004 (05/11/93), this NSPS limit also appears to have been an underlying assumption in the modeled emission rates for EU ID 16. This is clearly documented in the TAR for Air Quality Control Permit to Operate No. 9373-AA004 (05/11/93). The 162 ppmv H_2S limit is also reflected in Operating Permit No. AQ0267TVP01, Revision 4 as an ambient limit in Condition 12 and as the NSPS limit in Condition 33. With this understanding of the limit, CPAI is requesting a revised gaseous fuel H_2S limit of 300 ppmv to protect ambient air quality with this permit application for consistency with the ambient limit requested for all other EUs at the production facility. CPAI is not requesting a shield or a change to the applicability of NSPS Subpart J requirements to EU ID 16 and understands that the H_2S content of gaseous fuel combusted by EU ID 16 will still be restricted to the lower limit of 162 ppmv H_2S, which is also used as the basis for the PTE.

275 ppmv (at any time) H_2S Limit (EU IDs 42, 46, and 47)

The 275 ppmv H_2S limit was established for EU IDs 42, 46, and 47 in Minor Permit No. AQ0267MSS01 (08/05/05) as a PSD major modification classification avoidance limit (Condition 15) and also documented as an ambient air quality protection limit in Section 5 (Item 3) of the TAR. These limits have been carried forward into Minor Permit No. AQ0267MSS06 (03/28/14), though the limit is only explained as a PSD major modification classification avoidance limit in the current permit. Based on this understanding of the origins of this limit, CPAI is requesting that the inherent 275 ppmv H_2S ambient air quality protection limit be revised to 500 ppmv H_2S for consistency with the ambient limit requested for all other EUs at aggregated drill sites. As part of the requested permit hygiene, CPAI is also requesting that the 275 ppmv H_2S limit be removed as a PSD major modification classification avoidance limit in Condition 5 of Air Quality Control Minor Permit No. AQ0267MSS06 because this limit is unnecessary for PSD avoidance.

PSD Applicability Determination

Because the CPF-1 is a PSD major stationary source, CPAI has assessed the requested permit actions for applicability of PSD review under 40 CFR 52.21 and 18 AAC 50.306, adopted by reference in 18 AAC 50.040. This assessment assumes that increased H_2S concentrations in the gaseous fuel as a result of field gas souring is considered a physical change or change in the method of operations. The "actual-to-projected-actual applicability test" defined in 40 CFR 52.21(a)(2)(iv)(c) was used to make this determination. The net emissions increase resulting from the project using the actual-to-projected-actual applicability test is the difference between the projected future actual SO_2 emissions and the baseline actual SO_2 emissions.

Baseline Actual Emissions

As described in 40 CFR 52.21(b)(48)(ii), the baseline actual emissions are determined from the average actual emissions during a 24-month period within the previous 10 years. For this project, the period of January 2019 to December 2020 was selected because it most accurately reflects the current actual SO_2 emissions from gaseous fuel burning equipment. The baseline actual emissions for this PSD applicability evaluation are 107 tpy SO_2 based on the average of the annual SO_2 emissions calculated for the two consecutive 12-month periods, as shown in **Table 3**. The project baseline actual SO_2 emissions represent actual SO_2 emissions from the emissions units that are subject to the permit actions being requested by this application, which include: EU IDs 1 through 17, 29 through 33, 35 (gas-fired burners only), 37 through 40, and 42 through 49.

Projected Actual Emissions

After an analysis of the current emissions projections considering gaseous fuel H_2S concentration trends, forecasted source gaseous fuel consumption, and other long-term operational strategies to manage SO_2 emissions, it is expected that the actual-to-projected-actual net emissions increase in the next 10 years will be 39.6 tpy SO_2 as a result of this project. This net emissions increase is, therefore, not a significant emissions increase for SO_2 of 40 tpy under 40 CFR 52.21(b)(23)(i), and this action is not a major modification under 40 CFR 52.21(b)(2). The baseline actual emissions, projected actual emissions, and net actual emissions increase are shown in **Table 4**.

Table 3 Project Baseline Actual Emissions

Month	Monthly SO_2 (tons/month)						Annual SO_2 (tpy)
	Group I – Gas Turbines EU IDs 1-14	Group II – Gas-Fired Heaters EU IDs 15-17	Group IV - Flares EU IDs 29-33	Group V - Incinerators EU ID 35[(a)]	Group VI – Drill Site Heaters EU IDs 37-40, 42-49	Total	Total
Jan 2019	6.93	0.21	0.63	0.02	1.07	8.87	106
Feb 2019	6.63	0.20	0.42	0.02	1.02	8.29	
Mar 2019	6.26	0.20	0.46	0.02	1.06	7.99	
Apr 2019	6.33	0.20	0.49	0.02	1.04	8.08	
May 2019	6.62	0.24	0.44	0.03	1.17	8.50	
Jun 2019	7.84	0.23	0.45	0.03	1.24	9.79	
Jul 2019	8.47	0.22	0.53	0.03	1.31	10.56	
Aug 2019	7.05	0.16	0.46	0.02	1.11	8.81	
Sep 2019	7.49	0.20	0.43	0.03	1.17	9.31	
Oct 2019	7.66	0.19	0.42	0.03	1.19	9.49	
Nov 2019	6.67	0.19	0.47	0.02	1.06	8.41	
Dec 2019	6.70	0.20	0.46	0.02	1.01	8.39	
Jan 2020	6.85	0.20	0.46	0.02	1.04	8.57	108
Feb 2020	6.72	0.19	0.44	0.01	1.04	8.41	
Mar 2020	7.66	0.01[(b)]	0.69	0.03	1.45	9.83	
Apr 2020	7.78	0.01[(b)]	0.77	0.02	1.36	9.94	
May 2020	4.47	0.21	0.58	0.01	1.02	6.29	
Jun 2020	3.12	0.22	0.59	0.02	1.03	4.98	
Jul 2020	7.38	0.20	0.60	0.02	1.09	9.29	
Aug 2020	7.55	0.22	0.57	0.02	1.26	9.61	
Sep 2020	7.72	0.22	0.42	0.02	1.23	9.61	
Oct 2020	9.37	0.26	0.59	0.02	1.36	11.59	
Nov 2020	7.33	0.20	0.54	0.02	1.23	9.32	
Dec 2020	8.28	0.24	0.56	0.02	1.34	10.45	
						Annual Average	**107**

Notes:

(a) Baseline actual emissions for EU ID 35 (Comptro Incinerator) include emissions from only the primary and secondary gas-fired burners because emissions from waste/refuse incineration are not impacted by field gas souring.

(b) Actual SO_2 emissions from EU ID 16 (Born Crude Heater [KUTP]) were not included in the baseline actuals in March and April 2020 because the fuel gas combusted by EU ID 16 exceeded the applicable gaseous fuel H_2S content sulfur oxides emission limitation in 40 CFR 60 Subpart J on 3/27/2020 through 3/28/2020, 4/1/2020, and 4/11/2020. Because this resulted in non-compliant emissions, the average rate has been adjusted downward to exclude these emissions in accordance with 40 CFR 52.21(b)(48)(ii)(b). However, note that the magnitude of these emissions is sufficiently small that including or excluding these emissions does not change the average annual baseline actual emissions.

Table 4 Summary of PSD Applicability Emissions

Baseline Actual Emissions	Projected Actual Emissions	Net Emissions Increase
107 tpy SO_2	147 tpy SO_2	39.6 tpy SO_2

Review of Project Regulatory Applicability and Requirements

Permit Classifications

Based on the information presented and after evaluating the changes requested, CPAI expects these requests to result in the following permit classifications based on these actions:

- **A minor modification of a stationary source with an existing PTE greater than 40 tpy SO_2 and increase in PTE greater than 10 tpy SO_2 under 18 AAC 50.502(c)(3).** The increase in the CPF-1 SO_2 PTE as a result of the requested modifications is 20.6 tpy SO_2.
- **An application to revise or rescind Title I permit terms and conditions under 18 AAC 50.508(6).** This includes requests to revise terms and conditions in Construction Permit No. 9773-AC016, Revision 1 (AQ0267CPT04), Construction Permit No. AQ0267CP01, and Minor Permit No. AQ0267MSS06.

Note that the specific changes requested to Construction Permit No. 9773-AC016, Revision 1 (AQ0267CPT04), Construction Permit No. AQ0267CP01, and Minor Permit No. AQ0267MSS06 are detailed with redline-strikeout revisions highlighted in the revise/rescind requirements later in this form.

Other Regulatory Requirements

As explained in the PSD applicability determination, this action is not a major modification under 40 CFR 52.21(b)(2). Similarly, CPAI is not requesting any changes to BACT limits or other revisions that would impact PSD avoidance. As a result, PSD review is not required for this project. However, because the net emissions increase determined is greater than 50 percent of the 40 tpy SO_2 PSD-significant threshold, the provisions of 40 CFR 52.21(r)(6), including MR&R, will apply to the gaseous fuel-fired CPF-1 EUs because there is a "reasonable possibility" that a major modification may result from the project. Under these provisions, the owner or operator is required to monitor the emissions of any regulated New Source Review pollutant that could increase as a result of the project and calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of 5 years following resumption of regular operations after the change, or for a period of 10 years following resumption of regular operations after the change if the project increases the design capacity or potential to emit that regulated NSR pollutant at such emissions unit [40 CFR 52.21(r)(6)(iii)]. In addition, if the emissions for any year are determined to exceed the baseline actual emissions by more than the significant emissions threshold and if such emissions differ from the preconstruction projection, then a report is to be submitted to the Administrator (ADEC) within 60 days after the end of such year [40 CFR 52.21(r)(6)(v)]. These MR&R requirements will only apply to the emission units affected by this project, which include: EU IDs 1 through 17, 29-33, 35 (gas-fired burners only), 37 through 40, and 42 through 49.

Application Requirements

Based on the permit classifications under 18 AAC 50.502(c)(3) and 18 AAC 50.508(6), this permit application must include the following elements required under 18 AAC 50.540, which are addressed in the remainder of this application:

- For all permit classifications, the information prescribed by ADEC's:
    - Stationary Source Identification Form (**Attachment A** [this attachment]).
    - Emission Unit Information Form (**Attachment B**).
    - Emission Summary for Modification Form (**Attachment C**), including "detailed Excel spreadsheet emissions calculations" required in Section 2 and 3c of this form (**Attachment G**).
- For a minor modification to a stationary source with PTE greater than 40 tpy SO_2 and increase in PTE greater than 10 tpy SO_2 under 18 AAC 50.502(c)(3), an Ambient Air Quality Impact Analysis (AQIA) (**Attachment E**) demonstrating that the proposed potential emissions from the project will not interfere with the attainment or maintenance of the following ambient air quality standards and increments, as applicable:
    - 1-hour SO_2
    - 3-hour SO_2
    - 24-hour SO_2
    - Annual SO_2

- For a permit application to revise or rescind Title I permit conditions under 18 AAC 50.508(6), the following information is required:
  - A copy of the Title I permit that established the permit term or condition (**Attachment F**).
  - An explanation of why the permit term or condition should be revised or rescinded (**Attachment A**).
  - The effect of revising or revoking the permit term or condition on emissions, other permit terms, the underlying ambient demonstration, and compliance monitoring (**Attachment A**).
  - For revising a condition that allows avoidance of a permit classification, the information required for that type of permit unless the revised condition would also allow the owner or operator to avoid the classification (**Attachment A**).

Section 12 Project Description Continued

For **PALs under Section 10** of this application, include the information listed in 40 C.F.R. 52.21(aa)(3), adopted by reference in 18 AAC 50.040 [18 AAC 50.540(h)].

Not applicable to this application

For a **limit to establish offsetting emissions under Section 10** of this application, specify the physical or operational limitations necessary to provide actual emission reductions of the nonattainment air pollutant; including [18 AAC 50.540(i)]:

- A calculation of the expected reduction in actual emissions; and

  Not applicable to this application

- The emission limitation representing that quantity of emission reduction.

  Not applicable to this application

Section 12 Project Description Continued

For **ORLs under Section 10** of this application [18 AAC 50.540(j)], include:

A description of each proposed limit, including for each air pollutant a calculation of the effect the limit will have on the stationary source's potential to emit and the allowable emissions [18 AAC 50.225(b)(4)];

Not applicable to this application

A description of a verifiable method to attain and maintain each limit, including monitoring and recordkeeping requirements [18 AAC 50.225(b)(5)];

Not applicable to this application

Citation to each requirement that the person seeks to avoid, including an explanation of why the requirement would apply in the absence of the limit and how the limit allows the person to avoid the requirement [18 AAC 50.225(b)(6)];

Not applicable to this application

A statement that the owner or operator of the stationary source will be able to comply with each limit [18 AAC 50.225(b)(8)];

Not applicable to this application

Section 12 Project Description Continued

For **revising or rescinding Title I permit conditions under Section 10** of this application [18 AAC 50.540(k)], include:

An explanation of why the permit term or condition should be revised or rescinded [18 AAC 50.540(k)(2)];

CPAI is requesting that gaseous fuel sulfur content limits be increased to accommodate increasing H_2S concentrations in the gaseous fuel combusted at the stationary source and is requesting updates for permit hygiene. The specific changes requested to permit conditions are the following:

Requested Changes to Construction Permit No. 9773-AC016, Revision 1 (AQ0276CPT04):

Request #1: Revise the 200 ppmv (24-hour average) H_2S ambient air quality protection limit to 300 ppmv (annual average) in Condition V.A.3. (applicable to EU IDs 14 and 17) to reflect the assumptions in the updated ambient demonstration, as follows:

"To protect the 1-hour, 3-hour, 24-hour, and annual SO_2 Alaska Ambient Air Quality Standards; and the 3-hour, 24-hour, and annual Class II maximum allowable increases (increments); the Permittee shall not use fuel gas with a H_2S concentration that exceeds 300 ppmv at standard conditions on a consecutive 12-month average basis. Monitor, record, and report the consecutive 12-month average H_2S concentration as required in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50."

Requested Changes to Construction Permit No. AQ0267CP01

Request #2: Revise the 200 ppmv H_2S ambient air quality protection limits in Exhibit B to 300 ppmv (annual average) for EUs at the production facility (EU IDs 1 through 17, 29 through 33, and 35) and to 500 ppmv (annual average) for all EUs at the aggregated drill sites (EU IDs 37 through 40 and 42 through 49) to reflect the assumptions in the updated ambient demonstration, as follows:

Sources (Turbines): GE Frame 3 Turbines (C-2101-A, C-2101-B, and C-2101-C), EGT (Ruston) TB5000 Turbines (G-201-A, G-201-B, G-201-C, G-201-D, G-3201-E, and G-3201-F), and EGT (Ruston) TB5400 Turbines (P-2202-A, P-2202-B, P-CL07-A, and P-CL07-B)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO_2	GE Frame 3, EGT (Ruston) TB5000 Series, EGT (Ruston) TB5400 Series	200 ppmv H_2S in fuel gas	For all units: 300~~200~~ ppmv H_2S in fuel gas	Revised ambient demonstration submitted by CPAI on [DATE]. ~~Carried forward.~~
			109 tpy total combined, except G-201-(A through D)	EPA PSD BACT and 10/7/97 permit revision

Source (Turbine): GE Frame 6 Turbine (G-3203)~~,~~

Pollutant	Source(s)	Limits in AQCP to Operate No. 9773-AA016	Revised Limits	Explanation
SO_2	G-3203	200 ppmv H_2S in fuel gas (24-hr avg.)	No Change	Carried forward. ADEC BACT limit
			300 ppmv H_2S in fuel gas	Revised ambient demonstration submitted by CPAI on [DATE].

Sources (Heaters): Broach Dual-fired Heater (H-201); Born Crude Heater (G1-14-01); and Drill Site Heaters (H-1A01, H-1B01, H-2V01, H-3F01, H-1E01, H-1F01, H-1G01, H-1F-1901, H-1Q01, H-1R01, H-1Y01)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO_2	Broach Heater	200 ppmv H_2S in fuel gas	300~~200~~ ppmv H_2S in fuel gas	Revised ambient demonstration submitted by CPAI on [DATE]. ~~Carried forward.~~
	Born Heater	168 ppmv H_2S in fuel gas and 4.5 tpy	162 ppmv H_2S in fuel gas (running 3-hr average)	The limit in 40 CFR 60.104(a)(1) converts to 162 ppmv @ 59ºF. Ton per year limit is now rolled into the group limit.
			300 ppmv H_2S in fuel gas	Revised ambient demonstration submitted by CPAI on [DATE].
	Drill Site Heaters	200 ppmv H_2S in fuel gas	500~~200~~ ppmv H_2S in fuel gas	Revised ambient demonstration submitted by CPAI on [DATE]. ~~Carried forward.~~
			33 tpy (total for all units except H-201)	EPA PSD BACT and 10/7/97 permit revision

Source (Heaters): Kvaerner Fuel Gas Heater (H-3204) and ICE Air Heater (H-102A)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9773-AA016	Revised Limits	Explanation
SO_2	H-3204	200 ppmv H_2S in fuel gas (24-hr avg.)	No Change	Carried forward. ADEC BACT limit
			300 ppmv H_2S in fuel gas	Revised ambient demonstration submitted by CPAI on [DATE].
	H-102A	0.5% sulfur content in liquid fuel	No Change	Carried forward.

Sources: Incinerators (H-250 and H-347)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO_2	H-250	200 ppmv H_2S in fuel gas	300 ppmv H_2S in fuel gas ~~No change.~~	Revised ambient demonstration submitted by CPAI on [DATE]. ~~Carried forward.~~
		0.5% sulfur content in liquid fuel	No limit.	The incinerator supplemental burners do not use liquid fuel.
	H-347	200 ppmv H_2S in fuel gas	200 ppmv H_2S in fuel gas and 4 tpy	EPA PSD BACT and 10/7/97 permit revision
		0.5% sulfur content in liquid fuel	No limit.	The incinerator supplemental burners do not use liquid fuel.

Source (Flares): McGill Emergency Flares (H-101B, H-CR01A and H-CR01B) and Kaldair Smokeless Emergency Flares (H-KF01 and H-KF02)

Pollutant	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
SO_2	200 ppmv H_2S in fuel gas	300 ppmv H_2S in fuel gas ~~No change~~	Revised ambient demonstration submitted by CPAI on [DATE]. ~~Carried forward.~~

Requested Changes to Minor Permit No. AQ0267MSS06

Request #3: Revise the emission unit inventory in Condition 1, Table 1 to reflect the current inventory of production heaters at Drill Sites 1E and 1J for consistency with the information identified in the September 24, 2019 CPF-1 Title V Operating Permit Minor Modification Application submitted to ADEC, as follows:

EU ID	Tag No.	Emission Unit Description	Rating/Size
42	H-1E02	GTS Energy Production Heater (1E)	30.0 MMBtu/hr [heat input, LHV]
46	H-1J01A	Petrochem Development Production Heater (1J)	36.8 MMBtu/hr [heat input, LHV]
47	H-1J01B	Petrochem Development Production Heater (1J)	36.8 MMBtu/hr [heat input, LHV]

Request #4: Remove the PSD avoidance limits and MR&R in Conditions 4, 5, and 6 as these limits are no longer necessary to avoid PSD, as follows:

"~~**4.** The Permittee shall limit the combined total heat input rating of the production heaters listed in Table 1 to no more than 184 million British thermal units per hour (MMBtu/hr) heat input rate.~~

~~**5.** The Permittee shall not burn fuel gas with hydrogen sulfide greater than 275 parts per million by volume dry at DS1E and DS1J.~~

~~5.1 Monitor, record and report in accordance with fuel gas hydrogen sulfide monitoring requirements described in the operating permit issued for the source under AS 46 14 130(b) and 18 AAC 50.~~

~~5.2 Report Excess Emissions and Permit Deviations as described in the operating permit issued for the source under AS 46 14.130(b) and 18 AAC 50 anytime the fuel sulfur determined under Condition 5.1 exceeds the limit in Condition 5.~~

~~**6.** The Permittee shall limit combined sulfur dioxide (SO_2) emissions from the production heaters listed in Table 1 to no greater than 35 tons per 12 consecutive month period.~~

~~6.1 For the production heaters, monitor and record the monthly fuel gas consumption. Calculate and record the total SO_2 emissions from the production heaters for each calendar month using fuel consumption and fuel sulfur content measured in Condition 5.1. If the consumption records are missing or incomplete for any emission unit, estimate SO_2 emissions based on operating hours and maximum design fuel consumption rates.~~

~~6.2 Report the 12 consecutive month SO_2 emissions for the production heaters for each month of the reporting period in the operating report described in the operating permit issued for the source under AS 46 14.130(b) and 18 AAC 50.~~"

Request #5: Revise the inherent 275 ppmv (at any time) H_2S limit that was in Condition 5 (applicable to EU IDs 42, 46, and 47) to 500 ppmv to reflect the assumptions in the updated ambient demonstration, as follows:

"To protect the 1-hour, 3-hour, 24-hour, and annual SO_2 Alaska Ambient Air Quality Standards; and the 3-hour, 24-hour, and annual Class II maximum allowable increases (increments); the Permittee shall not use fuel gas with a H_2S concentration that exceeds 500 ppmv at standard conditions on a consecutive 12-month average basis. Monitor, record, and report the consecutive 12-month average H_2S concentration as required in the applicable operating permit issued for the stationary source under AS 46.14.130(b) and 18 AAC 50."

Request #6: Incorporate all requested revisions (Requests #1 through #5) and remaining unchanged terms and conditions in Minor Permit No. AQ0267MSS06 into one new consolidated minor permit (expected to be Permit No. AQ0267MSS08) and rescind Minor Permit No. AQ0267MSS06.

The effect of revising or revoking the permit term or condition on [18 AAC 50.540(k)(3)]:

- Emissions;

  The requested revisions have no effect on actual emissions, but as the H_2S concentrations in the gaseous fuel gradually increase, actual SO_2 emissions may also gradually increase over time. The requested increase in H_2S limits will increase potential SO_2 emissions from certain EU IDs that are not otherwise limited by existing BACT or NSPS limits (EU IDs 4 through 7, 15, 29 through 33, and 35). The removal of the PSD avoidance limits for EU IDs 42, 46, and 47 will result in a net decrease in PTE for these units for all regulated pollutants.

  CPAI has revised the estimated CPF-1 PTE based on these proposed permit revisions. The revised CPF-1 PTE and net change in PTE for all regulated pollutents are summarized in **Attachment C**, and updated CPF-1 PTE calculations are provided electronically in **Attachment G** of this application.

- Other permit terms;

  The proposed revisions will have no effect on other permit terms that has not already been discussed.

- The underlying ambient demonstration, if any;

  The requested revisions will have an effect on the underlying ambient demonstration for CPF-1 for SO_2, NO_x, CO, and PM_{10}.
  - CPF-1 $PM_{2.5}$ ambient air quality impacts have not been previously assessed.
  - Changes requested in this application only result in NO_x, CO, and PM_{10} emissions decreases. Therefore, predicted air quality impacts following the revisions will be lower for these pollutants and no further analysis is required to demonstrate compliance with air quality standards and PSD increments for these pollutants.
  - Changes requested in this application will result in SO_2 emissions increases. Therefore, an updated ambient air quality impact analysis is included in **Attachment E** of this application. That analysis assesses the changes in SO_2 impacts only.

- Compliance monitoring; and

  The proposed increases in gaseous fuel H_2S limits will have no effect on existing permit conditions related to monitoring gaseous fuel H_2S concentrations. CPAI also believes that based on the results of the revised ambient demonstration in **Attachment E**, which generally demonstrates large compliance margins with standards and increments, additional monitoring requirements are unnecessary to continue demonstrating compliance with the existing BACT and NSPS emission limitations and revised gaseous fuel H_2S limits.

  MR&R required under 40 CFR 52.21(r)(6) will be triggered as a result from these permit actions because the projected actual net emissions increase is greater than 50 percent of the 40 tpy SO_2 PSD-significant emissions threshold, based on the actual-to-projected-actual applicability test. These MR&R requirements only apply to the emission units affected by this project, which include EU IDs 1 through 17, 29 through 33, 35 (gas-fired burners only), 37 through 40, and 42 through 49. CPAI expects the following requirements based on this determination:

  - **Monitoring**: 40 CFR 52.21(r)(6)(iii) requires CPAI to monitor actual calendar year total SO_2 emissions from the “project” emission units (all fuel gas-burning equipment) for a period of 10 years after startup of the “project.” Emission estimates are currently developed each year using the methods allowed by the CPF-1 Title I (construction) and Title V (operating) permits and monthly monitoring of fuel gas consumption and H_2S concentrations, except for EU ID 16, where H_2S concentrations are monitored through the CEMS (continuous emissions monitoring system) in accordance with NSPS Subpart J.

- **Recordkeeping**: 40 CFR 52.21(r)(6)(i) and 40 CFR 52.21(r)(7) requires CPAI to document and maintain records including (a) a description of the project; (b) identification of the emission unit(s) whose emissions of a regulated New Source Review pollutant could be affected by the "project;" and (c) the applicability test used in the PSD applicability determination. CPAI shall make this information available upon request for inspection by the Administrator (ADEC). CPAI assumes that this application fulfills recordkeeping requirements.

- **Reporting**: 40 CFR 52.21(r)(6)(v) requires CPAI to submit a report to the Administrator (ADEC) if the annual emissions, in tons per year, from the "project" exceed the baseline actual emissions by a significant amount (40 tpy SO_2), and if such emissions differ from the "preconstruction" projection developed using the "actual-to-projected-actual applicability test". Such report shall be submitted to the Administrator (ADEC) within 60 days after the end of such year. The report should include: (a) the name, address and telephone number of the major stationary source; (b) the calculated annual emissions and net emissions increase from the baseline; and (c) any other relevant supporting information that the owner or operator wishes to include in the report (e.g., an explanation as to why the emissions differ from the "preconstruction" projection).

For revising a condition that allows avoidance of a permit classification, the information required for that type of permit, unless the revised condition would also allow the owner or operator to avoid the classification. [18 AAC 50.540(k)(4)]

The requested revisions do not affect any permit terms or conditions necessary to avoid any permit classifications.

Section 13 Other Application Material

The information listed below must be included in your air quality control minor permit application. *Note: These must be attached in order for your application to be complete.*

If required to submit an analysis of ambient air quality under 18 AAC 50.540(c)(2), or if otherwise requested by the Department:

☒ Attached are maps, plans, and/or aerial photographs as necessary to show the locations and distances of

- emissions units, buildings, emitting activities and boundaries of the associated with the stationary source, and
- nearby or adjacent residences, roads, other occupied structures and general topography within 15 kilometers.

(Indicate compass direction and scale on each.)

☒ Attached is a document (e.g., spreadsheet) showing coordinates and elevations of each modeled unit, along with parameters necessary to characterize each unit for dispersion modeling.

☒ Attached is an electronic copy of all modeling files.

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the Central Production Facility #1 (CPF-1) (Stationary Source Name)

submitted to the Department on: 05/03/2021.

Type of Application

☒ Initial Application

☐ Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the signature of a **Responsible Official**. Responsible Official is defined in 18 AAC 50.990. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

"Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete."

Signature: Bruce K	Date: MAY 3 2021
Printed Name: Bruce Kuzyk	Title: Vice President, North Slope Operations

Section 15 Attachments

☒ Attachments Included. List attachments:

- Attachment B – Emission Unit Information Form
- Attachment C – Emission Summary for Modification Form
- Attachment D – State Emission Standards Compliance Demonstration
- Attachment E – Ambient Air Quality Impact Analysis (AQIA)
- Attachment F – Copy of Construction Permit No. 9773-AC016 Revision 1 (AQ0267CPT04)
  Copy of Construction Permit No. AQ0267CP01
  Copy of Minor Permit No. AQ0267MSS06
- Attachment G – Emissions Calculations (enclosed electronically)
- Attachment H – Modeling Files (enclosed electronically)

Section 16 Mailing Address

Submit the minor permit application to the Permit Intake Clerk in the Department's Anchorage office. Submitting to a different office will delay processing. The mailing address and phone number for the Anchorage office is:

Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-6881

Legal Owners

Greater Kuparuk Area
Central Production Facility #1

ConocoPhillips Alaska, Inc.
700 G Street (Zip 99501)
P.O. Box 100360
Anchorage, AK 99510-0360

ExxonMobil Alaska Production Inc.
3301 C Street, Suite 400 (zip 99503)
P.O. Box 196601
Anchorage, AK 99519-6601

Chevron USA Inc.
P.O. Box 36366
Houston, TX 77236

Attachment B

Emission Unit Information Form

MINOR PERMIT APPLICATION – EMISSION UNIT INFORMATION

FOR A NEW STATIONARY SOURCE: Complete this form for all emissions units.

FOR A MODIFICATION TO AN EXISTING STATIONARY SOURCE:
IF YOU HAVE A TITLE V PERMIT: Complete this form for each emissions unit that is new or that is affected by a physical change or change in the method of operation.
IF YOU DO NOT HAVE A TITLE V PERMIT or APPLICATION CLASSIFIED UNDER 18 AAC 50.508(5): Complete this form for all emissions units.

Section 1 Stationary Source Information

Stationary Source Name: Central Production Facility #1 (CPF-1)

Section 2 Emissions Unit (EU) Identification (ID) and Description

Note: Do not use this section for emission units associated with asphalt plants, soil remediation, and rock crushers. Use the Supplementary Forms for these units.

EU ID No.	Description	Construction Date	Make / Model		Serial No.	Requested Limit* (specify units)	Max. Rated Capacity (kW, MMBtu), Horsepower (hp) or. Design Throughput
Group I – Gas Turbines							
1	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	5/2004	Frame 3	MS3002K	C-2101-A	No changes requested to existing operational limits.	16,260 hp ISO
2	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	10/2003	Frame 3	MS3002K	C-2101-B		16,260 hp ISO
3	GE Frame 3 (MS3002K-HE) Gas Lift Compressor	11/2004	Frame 3	MS3002K	C-2101-C		16,260 hp ISO
4	EGT (Ruston) TB5000 Electric Generator (Dual fired)	1979	Ruston	TB5000	G-201-A		4,900 hp ISO
5	EGT (Ruston) TB5000 Electric Generator (Dual fired)	1979	Ruston	TB5000	G-201-B		4,900 hp ISO
6	EGT (Ruston) TB5000 Electric Generator (Dual fired)	1979	Ruston	TB5000	G-201-C		4,900 hp ISO

7	EGT (Ruston) TB5000 Electric Generator (Dual fired)	1979	Ruston	TB5000	G-201-D		4,900 hp ISO
8	EGT (Ruston) TB5000 Electric Generator (Dual fired)	10/1981	Ruston	TB5000	G-3201-E		4,900 hp ISO
9	EGT (Ruston) TB5000 Electric Generator (Dual fired)	10/1981	Ruston	TB5000	G-3201-F		4,900 hp ISO
10	EGT (Ruston) TB5400 Water Injection Pump	5/1993	Ruston	TB5400	P-2202-A		5,400 hp ISO
11	EGT (Ruston) TB5400 Water Injection Pump	5/1993	Ruston	TB5400	P-2202-B		5,400 hp ISO
12	EGT (Ruston) TB5400 Water Injection Pump (Dual fired)	5/1993	Ruston	TB5400	P-CL07-A		5,400 hp ISO
13	EGT (Ruston) TB5400 Water Injection Pump (Dual fired)	5/1993	Ruston	TB5400	P-CL07-B		5,400 hp ISO
14	GE Frame 6 (PG6561B) Gas Turbine Electric Generator	1999	Frame 6	PG6561B	G-3203		53,500 hp (39,930 kW) ISO
Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)							
15	Broach Emergency Heater (Dual fired)	1979	Broach	---	H-201	No changes requested to existing operational limits.	27.8 MMBtu/hr [heat input, LHV]
16	Born Crude Heater (KUTP)	12/1984	Born	---	G1-14-01		44.4 MMBtu/hr [heat input, LHV]
17	Kvaerner Process Systems Fuel Gas Heater	1999	Kvaerner	---	H-3204		9.7 MMBtu/hr [heat input, LHV]
Group IV – Flares							
29	McGill Emergency Flare	10/1981	McGill	---	H-101B	No changes requested to existing operational limits.	1.6 MMscf/day (Pilot/Purge/Assist) Combined Total for All Flares
30	Kaldair I-58-VS Emergency Flare (LP)	1991	Kaldair	I-58-VS	H-KF01		
31	Kaldair I-87-FS Emergency Flare (HP)	1991	Kaldair	I-87-FS	H-KF02		
32	McGill Emergency Flare	unknown	McGill	---	H-CR01A		
33	McGill Emergency Flare	1/1985	McGill	---	H-CR01B		
Group V – Incinerators							
35	Comptro Incinerator with supplemental gas-fired burners: Primary Burner #1 Primary Burner #2 Secondary Burner	1980	Comptro	---	H-250	No changes requested to existing operational limits.	1,300 lb/hr 0.8 MMBtu(LHV)/hr 0.8 MMBtu(LHV)/hr 2.0 MMBtu(LHV)/hr
Group VI – Other Equipment (Drill Site Heaters)							
37	Latoka Drill Site Heater (1A)	12/1981	Latoka	---	H-1A01	No changes requested to existing operational limits.	16.4 MMBtu/hr [heat input, LHV]
38	Latoka Drill Site Heater (1B)	12/1981	Latoka	---	H-1B01		16.4 MMBtu/hr [heat input, LHV]
39	CE NATCO Drill Site Heater (1C)	1984	CE NATCO	---	H-2V01		14.5 MMBtu/hr [heat input, LHV]
40	CE NATCO Drill Site Heater (1D)	1985	CE NATCO	---	H-3F01		19.6 MMBtu/hr [heat input, LHV]
42	GTS Energy Production Heater (1E)	8/15/2005	GTS Energy	---	H-1E02		30.0 MMBtu/hr [heat input, LHV]

43	BS&B Drill Site Heater (1F)	10/1982	BS&B	---	H-1F01		14.9 MMBtu/hr [heat input, LHV]
44	BS&B Drill Site Heater (1G)	10/1982	BS&B	---	H-1G01		14.9 MMBtu/hr [heat input, LHV]
45	Latoka Drill Site Heater (1H)	6/1982	Latoka	---	H-1F-1901		16.4 MMBtu/hr [heat input, LHV]
46	Petrochem Development Production Heater (1J)	12/1/2004	Petrochem	---	H-1J01A		36.8 MMBtu/hr [heat input, LHV]
47	Petrochem Development Production Heater (1J)	12/1/2004	Petrochem	---	H-1J01B		36.8 MMBtu/hr [heat input, LHV]
48	BS&B Drill Site Heater (1Q)	1985	BS&B	---	H-1Q01		21.0 MMBtu/hr [heat input, LHV]
49	BS&B Drill Site Heater (1R)	1985	BS&B	---	H-1R01		17.2 MMBtu/hr [heat input, LHV]

**If no annual limit is applicable (e.g., hours, fuel), then specify not applicable (N/A).*
Please use additional copies of this sheet if necessary.

Have you identified each emission unit (if you do not have a Title V permit), or each new or affected emission unit (if you have an existing Title V permit) in Section 2 above? ☒ Yes ☐ No

If not, please explain:

Section 3 Emissions Unit Use

EU ID No.	Is unit portable?		Is the unit:						Is this unit a:		If limited operation, is the unit:		
[List same EUs as in Section 2.]	Yes	No	a nonroad engine? Yes	No	an intermittently used oil field support equipment per Policy 04.02.105? Yes	No	an oil field construction unit per Policy 04.02.104? Yes	No	primary (base load) unit?	or limited operation unit?	emergency or black start unit?	subject to a permit limit?	or other (specify)?
Group I – Gas Turbines													
1	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
2	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
3	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
4	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
5	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
6	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
7	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
8	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
9	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
10	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
11	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
12	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
13	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
14	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)													
15	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
16	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
17	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
Group IV – Flares													
29	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
30	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
31	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
32	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
33	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
Group V – Incinerators													
35	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
Group VI – Other Equipment (Drill Site Heaters)													
37	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
38	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
39	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
40	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
42	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
43	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐

44	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
45	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
46	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
47	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
48	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐
49	☐	☒	☐	☒	☐	☒	☐	☒	☒	☐	☐	☐	☐

Please use additional copies of this sheet if necessary.

Have you specified the use of each emission unit in Section 3 above? ☒ Yes ☐ No

If not, please explain:

Section 4 Fuel Information

Complete Section 4a or 4b for each emissions unit, as appropriate.

Section 4a Fuel Burning Equipment not Including Flares

EU ID No.	Fuel type(s)	Maximum fuel sulfur content	Fuel density (lb/gal) (if liquid fuel)	Higher heating value*	Maximum fuel consumption rate (gallons/hour or MMscf/hour)
Group I – Gas Turbines					
1	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.147 MMscf/hr
2	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.147 MMscf/hr
3	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.147 MMscf/hr
4	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0468 MMscf/hr
5	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0468 MMscf/hr
6	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0468 MMscf/hr
7	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0468 MMscf/hr
8	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0468 MMscf/hr
9	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0468 MMscf/hr
10	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0500 MMscf/hr
11	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0500 MMscf/hr
12	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0500 MMscf/hr
13	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0500 MMscf/hr
14	Gaseous fuel	300[1] ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.444 MMscf/hr
Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)					
15	Gaseous fuel	300 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0253 MMscf/hr
16	Gaseous fuel	300[2] ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0390 MMscf/hr
17	Gaseous fuel	300[1] ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.00882 MMscf/hr
Group VI – Other Equipment (Drill Site Heaters)					
37	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0149 MMscf/hr
38	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0149 MMscf/hr
39	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0132 MMscf/hr
40	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0178 MMscf/hr
42	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0273 MMscf/hr
43	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0135 MMscf/hr
44	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0135 MMscf/hr
45	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0149 MMscf/hr
46	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0335 MMscf/hr
47	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0335 MMscf/hr
48	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0191 MMscf/hr
49	Gaseous fuel	500 ☐ wt. % S ☒ ppmv H_2S	N/A	1,215 ☐ Btu/gal ☒ Btu/dscf Other	0.0156 MMscf/hr

**Use British thermal unit (Btu) per gallon (gal) for liquid fuels. Use Btu per dry standard cubic foot (dscf) for gaseous fuels.*
Please use additional copies of this sheet if necessary.

Notes:

1 **This is the maximum fuel sulfur content based on the ambient demonstration submitted with this permit application. The PTE is limited by the gaseous fuel H_2S BACT limit of 200 ppmv H_2S (24-hour average).**

2 **This is the maximum fuel sulfur content based on the ambient demonstration submitted with this permit application. The PTE is limited by the 40 CFR 60 (NSPS) Subpart J gaseous fuel H_2S limit of 162 ppmv (3-hour average).**

Have you provided the fuel details for each fuel-burning emission unit (excluding flares) in Section 4a above? ☒ Yes ☐ No

If not, please explain:

Section 4b Flares
Complete this section if the project/stationary source contains a flare.

Do you own or operate a flare? ☒ Yes ☐ No *(If not skip this section)*

EU ID No:	Heat release rate for pilot / purge operation (MMBtu/hr)	Maximum heat release rate (MMBtu/hr)	Flare gas heat content (Btu/scf)	Flare gas H_2S content (ppmv)
29	81.0 MMBtu(HHV)/hr	N/A	1,215 (HHV)	300
30			1,215 (HHV)	300
31			1,215 (HHV)	300
32			1,215 (HHV)	300
33			1,215 (HHV)	300

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you provided the fuel use details for all flares in Section 4b above? ☒ Yes ☐ No
If not, please explain:

Section 5 Materials Processed and Methods of Operation

Complete this section if the project/stationary source contains a materials-handling process.

Do you own or operate a materials-handling process~~flare~~? ☐ Yes ☒ No *(If not, skip this section)*

EU ID No.	Materials processed	Maximum material processing rate	Describe method of operation

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the material processing details in Section 5 above? ☐ Yes ☐ No

If not, please explain:

Section 6 Emission Control Information (if applicable)

Complete this section if the project/stationary source contains emission control equipment.

Do you own or operate emission control equipment? ☒ Yes ☐ No *(If not, note below and skip this section.)*

EU ID No.	Control equipment	Pollutant(s) controlled:	Description of the control equipment	Description of significant operating parameters and set points for the control equipment	The control equipment is necessary:		
					To comply with an emission standard	To avoid a project classification	Other – give purpose of control equipment
30	Flare; EU ID 30	VOC	Kaldair I-58-VS Emergency Flare (LP)	See 40 CFR 60.18	☐	☐	Control device used to comply with 40 CFR 60 (NSPS) Subpart VV (Standards of Performance for Equipment Leaks of VOC) requirements

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the details of any emission controls in Section 6 above? ☒ Yes ☐ No
If not, please explain:

Section 7 Emission Factors

Give exact citations of emission factor sources.

EU ID No.	Emission Factors								
	NOx	CO	PM-2.5	PM-10	PM	SO_2	VOC	HAPs	Lead
Group I – Gas Turbines									
1-3, 8-13	---	---	---	---	---	109 tpy	---	---	---
4-7	---	---	---	---	---	50.6 lb/MMscf (300 ppmv H_2S)	---	---	---
14	---	---	---	---	---	33.7 lb/MMscf (200 ppmv H_2S)	---	---	---
Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)									
15	---	---	---	---	---	50.6 lb/MMscf (300 ppmv H_2S)	---	---	---
16	---	---	---	---	---	Included in 33 tpy for EU IDs 37-40, 43-45, and 48-49	---	---	---
17	---	---	---	---	---	33.7 lb/MMscf (200 ppmv H_2S)	---	---	---
Group IV – Flares									
29-33	---	---	---	---	---	50.6 lb/MMscf (300 ppmv H_2S)	---	---	---
Group V – Incinerators									
35 (gas-fired burners only)	---	---	---	---	---	50.6 lb/MMscf (300 ppmv H_2S)	---	---	---
Group VI – Other Equipment (Drill Site Heaters)									
37-40, 43-45, 48, 49	---	---	---	---	---	33 tpy	---	---	---
42, 46, 47	100 lb/MMscf	84 lb/MMscf	7.6 lb/MMscf	7.6 lb/MMscf	7.6 lb/MMscf	84.3 lb/MMscf (500 ppmv H_2S)	5.5 lb/MMscf	---	---

EU ID No.	Sources and References for Emission Factors								
	NOx	CO	PM-2.5	PM-10	PM	SO_2	VOC	HAPs	Lead
Group I – Gas Turbines									
1-3, 8-13	---	---	---	---	---	BACT Limit based on Mass Balance (200 ppmv H_2S)	---	---	---
4-7	---	---	---	---	---	Mass Balance	---	---	---
14	---	---	---	---	---	Mass Balance based on BACT Limit (200 ppmv H_2S)	---	---	---
Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)									
15	---	---	---	---	---	Mass Balance	---	---	---
16	---	---	---	---	---	BACT Limit (Included with EU IDs 37-40, 43-45, and 48-49)	---	---	---
17	---	---	---	---	---	Mass Balance based on BACT Limit (200 ppmv H_2S)	---	---	---
Group IV – Flares									
29-33	---	---	---	---	---	Mass Balance	---	---	---
Group V – Incinerators									
35 (gas-fired burners only)	---	---	---	---	---	Mass Balance	---	---	---
Group VI – Other Equipment (Drill Site Heaters)									
37-40, 43-45, 48, 49	---	---	---	---	---	BACT Limit	---	---	---
42, 46, 47	AP-42, Table 1.4-1	AP-42, Table 1.4-1	AP-42, Table 1.4-2	AP-42, Table 1.4-2	AP-42, Table 1.4-2	Mass Balance	AP-42, Table 1.4-2	---	---

Please use additional copies of this sheet if necessary.

Include additional notes as warranted.

Only emission factors for EU IDs and pollutants impacted by the requested permit actions are summarized in Section 7. Emission factors provided are the basis for PTE calculations included in **Attachment G**.

Have you specified all emission factors and reference sources in Section 7 above? ☒ Yes ☐ No

If not, please explain:

Section 8 Applicable State Emission Limits (listed in 18 AAC 50.050 through 18 AAC 50.090)

Complete this section for emissions units that are new or are affected by the physical change or change in operation.

EU ID No.	Emission Limit or Standard	Regulation Citation	Compliance Method
1-17, 29-33, 37-40, 42-49	Sulfur Compound Emissions	18 AAC 50.055(c)	See **Attachment D**

Please use additional copies of this sheet if necessary.

NOTE: For this project, a demonstration of compliance with the State Emission Standards is provided only for the sulfur dioxide (SO_2) emission standard because SO_2 is the only pollutant with an estimated net increase in potential emissions. All other EU IDs subject to only administrative revisions for permit hygiene will continue to operate in compliance with the State Emission Standards that are currently applicable.

Have you specified all applicable state emission limits in Section 8 above? ☒ Yes ☐ No

Have you specified a demonstration of compliance for each emission limit or standard? ☒ Yes ☐ No

If you answered "no" to either question, please explain:

Section 9 Incinerators

Complete this section if the project/stationary source contains an incinerator.
Do you own or operate an incinerator? ☒ Yes ☐ No *(If not, skip this section.)*

EU ID No.	Fuels Burned (type and consumption rate)	Rated capacity in pounds per hour	Type of waste burned
35	Gaseous Fuel; 0.00327 MMscf/hr	1,300 lbs/hr	More than 30% of municipal solid waste or refuse-derived fuel; 10% or less of hospital waste and/or medical/infectious waste

Please use additional copies of this sheet if necessary

Include additional notes as warranted.

Have you specified the details of all incinerators in Section 9 above? ☒ Yes ☐ No
If not, please explain:

Attachment C

Emissions Summary for Modification Form

Alaska Department of Environmental Conservation
Air Quality Control Minor Permit Application

EMISSIONS SUMMARY FORM
Modification of an Existing Stationary Source

Section 1 Stationary Source Information

Stationary Source Name: Central Production Facility #1 (CPF-1)

Section 2 Existing Potential to Emit (PTE) for the Entire Stationary Source BEFORE the Modification

EU ID No.	*Does project affect the emissions unit?*	PTE (tpy)[5]								
		CO	NOx[4]	PM-2.5[1]	PM-10[1]	PM	SO_2	VOC[2]	Fugitive VOC[3]	Fugitive PM[3]
Group I – Gas Turbines										
1-3, 8-13	☒ Yes ☐ No	612	1,550	50.0	50.0	50.0	109	7.50	N/A	N/A
4-7	☒ Yes ☐ No	68.6	268	5.52	5.52	5.52	27.7	1.76	N/A	N/A
14	☒ Yes ☐ No	96.4	1,170	11.0	11.0	11.0	65.6	21.9	N/A	N/A
Group II – Gas-Fired Heaters (Excluding Drill Site Heaters)										
15	☒ Yes ☐ No	10.7	13.6	1.06	1.06	1.06	5.38	0.703	N/A	N/A
16	☒ Yes ☐ No	(Included in PTE for EU IDs 37-40, 43-45, 48, and 49 under group BACT limits)						1.12	N/A	N/A
17	☒ Yes ☐ No	3.86	4.69	0.350	0.350	0.350	1.30	0.253	N/A	N/A
Group III – Liquid Fuel-Fired Equipment										
22-28	☐ Yes ☒ No	1.26	5.87	0.416	0.416	0.416	0.333	0.468	N/A	N/A
69, 70	☐ Yes ☒ No	2.72	19.7	0.278	0.278	0.278	0.018	0.393	N/A	N/A
Group IV – Flares										
29-33	☒ Yes ☐ No	131	24.1	7.73	7.73	7.73	9.85	22.4	N/A	N/A
Group V – Incinerators										
35	☒ Yes ☐ No	28.9	9.90	19.4	19.4	19.4	7.34	8.34	N/A	N/A
Group VI – Other Equipment (Drill Site Heaters)										
37-40, 43-45, 48, 49	☒ Yes ☐ No	44.0	124	14.0	14.0	14.0	33.0	3.95	N/A	N/A
42, 46, 47	☒ Yes ☐ No	66.4	79.0	6.00	6.00	6.00	35.0	4.35	N/A	N/A

Group VII – NSPS Storage Tanks										
51-55	☐ Yes ☒ No	0.000	0.000	0.000	0.000	0.000	0.000	0.565	N/A	N/A
Topping Plant										
57	☐ Yes ☒ No	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A	N/A
Drill Site 1B Cuttings Reinjection Module										
68a-68d	☐ Yes ☒ No	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A	N/A
71	☐ Yes ☒ No	0.953	3.81	0.453	0.453	0.453	4.03	0.0648	N/A	N/A
Other										
Unregulated Tanks	☐ Yes ☒ No	0.000	0.000	0.000	0.000	0.000	0.000	392	N/A	N/A
Portable IEU Heaters/ Boilers	☐ Yes ☒ No	6.30	25.3	1.40	1.40	1.40	21.5	0.400	N/A	N/A
Total tons per year (tpy)		**1,073**	**3,293**	**118**	**118**	**118**	**320**	**467**	**N/A**	**N/A**

☒ Detailed Excel spreadsheet emissions calculations are attached. *These must be attached in order for your application to be complete.*
Include multiple copies of this page if more space is required.

NOTE: "Existing PTE before Modification" emissions calculations are based on calculations submitted to ADEC with the September 24, 2019 CPF-1 Title V Operating Permit Minor Modification Application, with the addition of the emissions summarized in the Off-Permit Change Notification dated March 9, 2020 and submitted to ADEC March 10, 2020, for the operation of the Drill Site 1B drilling cuttings boiler (EU ID 71). "PTE after Modification" emissions calculations are included in Attachment G of this application.

☐ *Check this box if fugitive emissions are included in permit applicability under 18 AAC 50.502(i).*
Brief description of why fugitive emissions are included in permit applicability:

Notes:

[1] Include condensable particulate matter for PM-10 and PM-2.5.
[2] If total PTE for volatile organic compounds (VOCs) is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions.
[3] Fugitive VOC and PM emissions are included as assessable emissions regardless of permit applicability.
[4] Fugitive NOx emissions from blasting should be included in the PTE column for NOx.
[5] **Emission units which have been removed from service (EU IDs 36, 41, and 50) are not included in the Existing PTE because their potential emissions are zero.**

Have you completed Section 2 above? ☒ Yes ☐ No
If not, please explain:

Section 3 Change in Emissions

Show ONLY existing emissions units that are affected by the project. Show EITHER the change in actual emissions (Sections 3a and 3b) OR the change in potential emissions (Sections 2 and 3c).

Section 3a Actual Emissions – NOx, CO, PM-2.5, PM-10, PM, SO_2 (18 AAC 50.502(c)(3)(B) or 18 AAC 50.508(5))

If an existing emissions unit is being removed, enter zero for "projected actual emissions" for that unit.

See 18 AAC 50.502 for directions on calculating "baseline actual emissions" and "projected actual emissions."

EU ID No.	Type of Modification		Baseline Actual Emissions (tpy)					Projected Actual Emissions (tpy)				
	Modified EU	Removed EU	CO	NO_X	PM-2.5[1]	PM-10[1]	SO_2	CO	NO_X	PM-2.5[1]	PM-10[1]	SO_2
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
	☐	☐										
Total												

Use this table only if the project does not include new emission units. See 18 AAC 50.502(e) and (h)(4)

☐ Detailed Excel spreadsheets emissions calculations are attached. *These must be attached in order for your application to be complete. You may give an example calculation where the method of calculation is identical for multiple emissions units.*

Notes:

[1] Include condensable particulate matter for PM-10 and PM-2.5.

Section 3b Change in Actual Emissions (18 AAC 50.502(c)(3)(B) or 18 AAC 50.502(c)(4)(B))

If you choose actual emissions as your basis, complete Sections 3a and 3b for each emissions unit for which you answered "YES" in Section 2. Change in actual emissions = "projected actual emissions" minus "baseline actual emissions" from Section 3a.

EU ID No.	**Change in Actual Emissions (tpy)**				
	CO	**NOx**	**PM-2.5**[1]	**PM-10**[1]	**SO_2**
Total					

Use this table only if the project does not include new emission units. See 18 AAC 50.502(e) and (h)(4)

[1] Include condensable particulate matter for PM-10 and PM-2.5.

Have you completed Section 3a and 3b above? ☐ Yes ☐ No
If not, please explain:

Section 3c Change in Potential to Emit (PTE) (18 AAC 50.502(c)(3)(A) or 18 AAC 50.502(c)(4)(A))

If you choose PTE as your basis for calculation, complete this section for each emissions unit that is new and for each emissions unit for which you answered "YES" in Section 2.

Under "PTE AFTER the Modification", enter zero if you are removing the emissions unit.

Under "Change in PTE":
For each EXISTING emissions unit, subtract the amount of PTE BEFORE Modification in Section 2 from the "PTE AFTER the Modification"
For each NEW emissions unit, enter the amount from "PTE AFTER the Modification."

EU ID No.	**PTE - AFTER the Modification (tpy)** [only from modified and new emissions units. Do not list emission units for which you answered "NO" in Section 2.]								**Change in PTE (tpy)**							
	CO	**NO_X**	**PM-2.5[1]**	**PM-10[1]**	**PM**	**SO_2**	**VOC**	**HAPs[2]**	**CO**	**NO_X**	**PM-2.5[1]**	**PM-10[1]**	**PM**	**SO_2**	**VOC**	**HAPs**
1-3, 8-13	N/A	N/A	N/A	N/A	N/A	109	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
4-7	N/A	N/A	N/A	N/A	N/A	41.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13.8	N/A	N/A
14	N/A	N/A	N/A	N/A	N/A	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
15	N/A	N/A	N/A	N/A	N/A	7.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.76	N/A	N/A
17	N/A	N/A	N/A	N/A	N/A	1.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
29-33	N/A	N/A	N/A	N/A	N/A	14.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.93	N/A	N/A
35	N/A	N/A	N/A	N/A	N/A	7.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.234	N/A	N/A
16, 37-40, 43-45, 48, 49	N/A	N/A	N/A	N/A	N/A	33.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
42, 46, 47	41.3	49.1	3.73	3.73	3.73	34.8	2.70	N/A	-25.1	-29.9	-2.27	-2.27	-2.27	-0.207	-1.64	N/A
Total	**41.3**	**49.1**	**3.73**	**3.73**	**3.73**	**315**	**2.70**	**N/A**	**-25.1**	**-29.9**	**-2.27**	**-2.27**	**-2.27**	**20.6**	**-1.64**	**N/A**
Source-Wide	**1,048**	**3,263**	**115**	**115**	**115**	**341**	**465**	**51.8**	**-25.1**	**-29.9**	**-2.27**	**-2.27**	**-2.27**	**20.6**	**-1.64**	**N/A**

Include multiple copies of this page if more space is required.
☒ Detailed Excel spreadsheet emissions calculations are attached. *These must be attached for your application to be complete.*

NOTE: "Existing PTE before Modification" emissions calculations are based on calculations submitted to ADEC with the September 24, 2019 CPF-1 Title V Operating Permit Minor Modification Application, with the addition of the emissions summarized in the Off-Permit Change Notification, dated March 9, 2020, and submitted to ADEC March 10, 2020, for the operation of the Drill Site 1B drilling cuttings boiler (EU ID 71). "PTE after Modification" emissions calculations are included in Attachment G of this application.

Notes:

[1] Include condensable particulate matter for PM-10 and PM-2.5

[2] If the total PTE for hazardous air pollutants (HAPs) for the entire stationary source is at least 10 tpy, include a separate Excel spreadsheet that shows the HAP emissions. **NOTE: CPAI is not requesting any changes to the CPF-1 HAP PTE with the proposed changes in this application. Therefore, a separate spreadsheet with those calculations has not been included.**

Have you completed all portions of Section 3c above? ☒ Yes ☐ No

If not, please explain:

Attachment D

State Emission Standards Compliance Demonstration

DEMONSTRATION OF COMPLIANCE WITH 18 AAC 50.055(C) – SULFUR-COMPOUND EMISSIONS STANDARD

18 AAC 50.055(c) applies to all fuel burning equipment and states that SO_2 emissions may not exceed 500 ppmv averaged over 3 hours.

For the gaseous fuel-burning equipment affected by the project, compliance with the 500 ppmv sulfur compound emissions standard is determined using the following calculation methodology:

Equations:

$$SO_2(\text{ppmv}) = \frac{SO_2\left[\frac{\text{scf}}{\text{hr}}\right]}{\text{Exhaust}\left[\frac{\text{MMscf}}{\text{hr}}\right]} = \frac{\text{Fuel}\left[\frac{\text{MMscf}}{\text{hr}}\right] x\ \text{EF}\left[\frac{\text{lb } SO_2}{\text{MMscf}_{\text{fuel}}}\right] x \left(\frac{\text{lb-mole}}{64\text{ lb } SO_2}\right) x \left(\frac{379.4\text{ scf}}{\text{lb-mole}}\right)}{\text{Fuel}\left[\frac{\text{MMscf}}{\text{hr}}\right] x\ \text{Fuel HHV}\left[\frac{\text{MMBtu}}{\text{MMscf}}\right] x\ \text{F}_\text{d}\left[\frac{\text{dscf}}{\text{MMBtu(HHV)}}\right] x \left(\frac{1\text{ MMscf}}{10^6\text{ scf}}\right) x \left(\frac{20.9}{20.9\text{ - }\%O_2}\right)}$$

$$\text{EF}\left[\frac{\text{lb } SO_2}{\text{MMscf}_{\text{fuel}}}\right] = (\text{ppmv } H_2S)\ x \left(\frac{1\text{ scf}/10^6 scf}{1\text{ ppmv}}\right) x \left(\frac{10^6 scf}{1\text{ MMscf}}\right) x \left(\frac{\text{lb-mole}}{379.4\text{ scf } H_2S}\right) x \left(\frac{\text{lb-mole } SO_2}{\text{lb-mole } H_2S}\right) x \left(\frac{64\text{ lb } SO_2}{\text{lb-mole}}\right)$$

Assumptions:

Fuel HHV =	1,215	MMBtu(HHV)/MMscf (PTE assumption)
F_d =	8,710	dscf/MMBtu(HHV) (USEPA Method 19, Table 19-2)
$\%O_2$ =	5	% (assumption)
SO_2 *(ppmv) =*	500	ppmv (max sulfur exhaust emissions allowed under 18 AAC 50.055(c))

Determination:

Based on these assumptions and solving for the gaseous fuel H_2S content (ppmv), this demonstration indicates that an H_2S content of greater than 6,955 ppmv would be required to exceed the 500 ppmv sulfur compound emissions standard.

The proposed H_2S content of the gaseous fuel combusted by fuel burning equipment affected by this project will be no more than:

- **300 ppmv H_2S** for the production facility equipment, which include turbines, heaters, and flares (EU IDs 1 through 17 and 29 through 33).

- **500 ppmv H_2S** for the aggregated drill site heaters (EU IDs 37 through 40 and 42 through 49).

As shown, the proposed sulfur content of all fuel combusted by the emission units affected by this project is well below 6,955 ppmv H_2S for gaseous fuels. Therefore, all project-affected fuel burning equipment will comply with the sulfur compound emissions standard in 18 AAC 50.055(c).

Attachment E

Ambient Air Quality Impact Analysis (AQIA)

CENTRAL PRODUCTION FACILITY #1
H_2S LIMIT INCREASE

Cumulative Ambient Air Quality Impact Assessment

Prepared for:

ConocoPhillips Alaska, Inc.

May 2021

global **environmental** and **advisory** solutions

Cumulative Ambient Air Quality Impact Assessment

Prepared for:
ConocoPhillips Alaska, Inc.
P.O. Box 100360
Anchorage AK 99510-0360

This document has been prepared by SLR International Corporation (SLR). The material and data in this report were prepared under the supervision and direction of the undersigned.

T A Damiana
Tom Damiana
Principal Air Quality Engineer

Michael J Ring
Michael Ring
Associate Scientist

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FIGURES

TABLES

APPENDICES

1. INTRODUCTION

This document details an approach to and the results of a near-field cumulative ambient air quality impact assessment (AQIA) for applicable criteria pollutants and averaging periods conducted for the ConocoPhillips Alaska, Inc. (CPAI) Central Production Facility #1 (CPF-1) H_2S limit increase project. Attachment A, Table 1 of the project air quality permit application package summarizes the existing fuel gas H_2S concentration limits from the source permits and the requested changes. In summary, CPAI is primarily requesting an increase in the fuel gas H_2S concentration limit to no more than 500 ppmv applicable to drill site emission units, and no more than 300 ppmv for emission units at the production facility. The limits requested are specific to protecting ambient air quality and could be superseded by more restrictive limits if they exist. CPAI is also asking for revisions related to permit hygiene which reduce potential to emit. Both revisions are associated with a project at drill site (DS) 1J and DS1E permitted several years ago. The first revision is to remove a 184 MMBtu/hour aggregate heater rating limit set when equipment-specific ratings were not available and replace it with potential to emit based on installed equipment ratings. The second revision is to remove a 35 ton per year aggregate SO_2 limit and replace it with potential to emit based on installed equipment ratings.

The requested changes impact the ambient air quality demonstration that underlies the current permit limit and triggers minor source review for SO_2. Therefore, in accordance with 18 AAC 50.540, the permit's underlying ambient demonstration must be updated, and compliance with the with the SO_2 Alaska Ambient Air Quality Standards (AAAQS) and Prevention of Significant Deterioration (PSD) Class II Increments must be demonstrated for the project. This AQIA presents the methodologies and results which demonstrate that CPF-1 remains in compliance with applicable air quality standards and increments following the requested changes. Since the change only affects SO_2 emissions, this AQIA only involves assessing SO_2 impacts. Therefore, the AQIA is limited to 1-hour, 3-hour, 24-hour, and annual SO_2 AAAQS and PSD Class II Increments.

2. PROJECT INFORMATION AND DESCRIPTION OF THE TECHNICAL APPROACH

This AQIA involved the execution of a steady-state dispersion model to predict pollutant concentrations in ambient air based on stack parameters, emissions, and structures representative of CPF-1 sources. Unless otherwise noted, the AQIA comports with guidelines and methodologies articulated in the following documents:

- Guideline on Air Quality Models [published as 40 CFR 58, Appendix W] (USEPA 2017).
- Alaska Department of Environmental Conservation (ADEC) Modeling Review Procedures Manual (ADEC 2018a).

Standard modeling approaches are described in **Table 2-1.** The ADEC Air Quality Modeling Submittal Checklist for Minor Permit Applications (ADEC 2017) was used as the foundation for developing this table. Each applicable element from the ADEC checklist was developed into a row in **Table 2-1** that includes a column indicating how each checklist item has been addressed.

Table 2-1 Modeling Approach

Checklist Element	Remarks
1. Background Information	
Map Showing the Source Location	See **Figure 2-1**.
Air Quality Control Region Containing the Source	The project is in the Northern Alaska Intrastate Air Quality Control Region.
Location Attainment Classification	The project location is attainment/unclassifiable and not near a non-attainment area.
Requirements for an Ambient Assessment	This project requires an ambient assessment for the 1-hour, 3-hour, 24-hour, and annual SO_2 AAAQS as required by the following project classifications: • 18 AAC 50.502(c)(3)(A)(ii) • 18 AAC 50.508(6) It also requires an ambient assessment for the 3-hour, 24 hour, and annual SO_2 Class II PSD Increments as required by a project classified as 18 AAC 50.508(6).
Modeling Protocol	A modeling protocol was not submitted. However, methodologies closely follow those used for a very similar project recently approved by ADEC as part of issuing minor permit AQ0171MSS03 for the CPAI Central Processing Facility #3 (CPF-3).

Checklist Element	Remarks
2. Approach	
General Approach	The following considerations drove the general approach to this ambient assessment: • It was assumed that this project was too complex for a screening analysis and that impacts would be greater than the Significant Impact Levels (SILs); therefore, only cumulative impact analyses were conducted. • This analysis was conducted to demonstrate compliance with SO_2 AAAQS and PSD Increments assuming fuel gas H_2S concentrations would be no more than 500 ppmv at the drill sites and 300 ppmv at the main CPF-1 facility. Typically, an assessment like this would focus on the production facility with the drill sites modeled as offsite sources. However, because of the high limit requested for the drill sites and the large heaters that could be constructed at Drill Site (DS) 1E and DS1J, a near-field analysis was conducted for representative drill sites in addition to the CPF-1 facility. DS1E and DS1J were selected as the representative drill sites for separate nearfield analyses because large production heaters could be constructed at these sites and they are located close to CPF-1. As a result, it is anticipated that no other drill site will experience higher nearfield impacts making the DS1E and DS1J impacts conservatively representative of those expected around all other drill sites. • Three CPF-1 emission units have fuel gas H_2S limits lower than the 300 ppmv facility-wide limit modeled for all CPF-1 emissions units. This was done for simplicity and to establish a single source-wide ambient protection limit. *…Remark Continued on the Next Page*

Checklist Element	Remarks
General Approach (continued)	*Remark Continued from the Prior Page…* • Three groups of CPF-1 emission units have group emission limits. Rather than attempting to apportion those limits among the group emission units, each emission unit was modeled at a potential to emit assuming the group limit was not in place. This results in modeling more annual emissions than allowed by the facility permits. • As part of the current permitting action, the potential to emit associated with DS1E and DS1J emission units is being decreased by removing the aggregate heater input rating of 184 MMBtu/hour and the 35 ton per year SO_2 emissions limit and replacing them with potential to emit based on installed equipment ratings. This revision is not accounted for in the modeled emission rates which results in modeling more annual emissions than is being requested with this permitting action. • The CPF-1 dispersion modeling simulation dates to 1992 and has been updated often since then. Therefore, considerable effort was put into ensuring the simulation was an accurate representation of the current facility configuration. The most significant improvement was to add the facility Waste Heat Recovery Unit (WHRU) stacks which had not been previously modeled as distinct stacks.
Modeled Operating Scenario Description	One operating scenario was modeled with all sources operating concurrently at loads and emission rates consistent with or higher than existing and requested permit limits.
2.1 Model Selection	
Model Source Code	• AERMOD version 19191 • AERMET version 19191 • BPIPPRM version 04274 • AERSURFACE: Not required to be used because the meteorological data was generated with North Slope default values.
Model Source Code Modifications	All codes were used without modification.
Alternative Modeling Techniques	Alternative modeling techniques were not used.
Model Options	All modeling options were set to default settings.

Checklist Element	Remarks
2.2 Modeling Domain	
Modeling Domain Description	The receptor grid extended to at least 4 kilometers in all directions from CPF-1 facility emission sources and at least 1 kilometer in all directions from DS1E and DS1J. All grids are at sufficient density to ensure maximum impact locations were predicted by the modeling. Receptor grid details are provided further down in this table.
2.3 Meteorological Data	
Description of Meteorological Data and Data Processing	This analysis relied on the same meteorological input data used to support the recently approved CPF-3 H_2S increase project described in Technical Analysis Report supporting Permit AQ0171MSS03. Because of the proximity of CPF-1 to CPF-3, and the community of Nuiqsut, this data is representative of plume transport conditions in the CPF-1 project area. That data set was built from the following: • Approved site-specific, PSD-quality surface data collected at the Nuiqsut Meteorological Monitoring Station located in Nuiqsut, Alaska during calendar years 2016, 2017, and 2019. • National Weather Service (NWS) upper air data collected near Utqiaġvik, Alaska which is the nearest upper air station. AERMET settings followed those approved for modeling. Surface based inputs utilized in Stage 3 AERMET processing were standard North Slope seasonal and surface characteristic assignments specified in the ADEC Modeling Review Procedures Manual (ADEC 2018a).
2.4 Coordinate System	
Coordinate System Used	Universal Transverse Mercator (UTM) Zone 6, NAD83.
2.5 Land Use Analysis	
Description of Surrounding Land Use	Surrounding land use is rural.
Land use Classification Methodology	Auer land classification procedure recommended in 40 CFR Part 51 Appendix W, Section 7.2.1.1(b)(i).

Checklist Element	Remarks
2.6 Terrain	
Handling of Terrain	The ground level elevation throughout the entire modeling domain was set to 0 meters to simulate the flat terrain surrounding the project location. This is a practice common for new source review modeling on the Alaskan North Slope coastal plain. Building and source base elevations were set to 1.5 meters (5 feet) because they are located on a typical elevated gravel pad.
Map Showing Local Topography	As described, the local terrain is essentially flat. Therefore, a topographic map has not been provided.
2.7 Emission Unit (EU) Inventory	
List of Project EUs	See **Table 2-2**.
List of Modeled Nearby Sources	While there are no sources that would cause a significant concentration gradient in the impact area of the source under review and would be considered a Nearby Source, all stationary sources located within 20 kilometers of CPF-1 were modeled explicitly to ensure that the impacts from regional increases in SO_2 resulting from fuel gas souring were not underestimated and to properly consider increment consuming emissions. Refer to **Appendix B** for a list of modeled offsite sources and a description of how these sources were characterized in the modeling.
Characterization of Project Sources	All project sources were modeled as point sources because the modeled emissions will pass through an exhaust stack. Modeled parameters are found in **Table 2-3**.
Cross Reference between EU Names and Model IDs	See **Table 2-2**.
Description of Operating Scenarios	A single scenario was modeled with all sources modeled concurrently at the maximum emission rates detailed in permit application Attachment C (Emissions Summary Form) and Attachment D (Emissions Calculations Spreadsheet) and further described in **Table 2-4**. While only a single scenario was modeled, 3 separate near-field assessments were conducted to confirm compliance in the near-field of the CPF-1 facility and associated drill sites.

Checklist Element	Remarks
Description of Increment Consuming and Expanding Sources	All modeled project sources and offsite sources were modeled as increment consuming. Project sources which include those at aggregated drill sites were modeled at maximum emission rates detailed in permit application Attachment C (Emissions Summary Form) and Attachment D (Emissions Calculations Spreadsheet). All offsite sources were modeled using recent actual emissions retrieved from the 2017 National Emissions Inventory (NEI) (USEPA 2020). SO_2 emissions from regional mobile and nonroad source activity is assumed to be increment expanding and have not been modeled. This includes emissions from drill rigs and general oilfield maintenance activity. These emissions were higher at the baseline date compared to now because: 1) there was more mobile and nonroad source activity at the baseline date since these activities are tied to oil production, which was 4 times higher at the baseline date, and 2) the sulfur content of the fuel combusted by these sources was at least 100 times higher than what is currently combusted. The potential benefit from these increment expanding emissions were not included in the analysis leading to conservatism.
Description and Justification for Non-Modeled Sources	Non-modeled sources include natural sources, other unidentified sources in the vicinity of the project (e.g., construction equipment, oilfield maintenance equipment, drilling activity and mobile activities, etc.), and regional transport contributions from more distant sources (i.e., domestic, and international). The ambient contributions from these sources were accounted for through use of ambient monitoring data as described in **Appendix A**. *…Remark Continued on the Next Page*

Checklist Element	Remarks
Description and Justification for Non-Modeled Sources (continued)	*Remark Continued from the Prior Page…* For this project, the inventory of non-modeled sources also includes an inventory of seven small (<300 hp) and intermittently operated freeze protection pump engines located at several of the aggregated drill sites and one seasonally operated 6.09 MMBtu/hour drill cuttings boiler operated at the Drill Site 1B (DS1B) grind and inject operation. Properly characterizing the impacts from these small close to the ground emission points in AERMOD is difficult and the modeling results questionable. Therefore, the impacts from these sources have been more appropriately accounted for through use of ambient monitoring data as described in **Appendix A**.
2.8 EU Release Parameters	
Source Parameter Identification	See **Table 2-3**.
Modeled Emission Rates are Described	A list of modeled emission rates and their basis are found in **Table 2-4**. These are provided in addition to calculations provided in permit application Attachment C (Emissions Summary Form) and Attachment G (Emissions Calculations Spreadsheet).
Restrictions to Modeled Emission Rates are Described	See **Table 2-4** noting the following: Emission Units with Annual Group Emission Limits: For equipment with an annual group emission limits, such as turbines and remote production pad heaters, the short-term and annual modeled emissions rates were calculated assuming fuel gas containing a maximum H_2S concentration (i.e., 300 ppmv for the CPF-1 facility and 500 ppmv H_2S for the drill sites). For units included in group limits, this results in annual emissions about 150% higher than allowed by the group limits which will overstate annual impacts.
Modeled Stack Parameters are Described	See **Table 2-3** and **Table 2-4**.
The Basis for the Modeled Stack Parameters are Described	See **Table 2-3** and **Table 2-4**.
Stack Heights do not Exceed GEP	All stacks were evaluated to determine if heights are Good Engineering Practice (GEP) as defined in 40 CFR 51.100. The current version of BPIPPRM was used for this analysis.

Checklist Element	Remarks
Modeled Stack Parameters Reflect Worst-Case Based on a Load Screening Analysis as Warranted	SO_2 emissions are directly proportional to emission unit load. Therefore, emissions will be maximized at full load and do not decrease quickly enough to result in higher impacts at part load when stack exit temperature and velocity are less favorable for plume dispersion. Therefore, a Load Screening was not conducted for this analysis except for dual fuel-fired emission units and turbines which include WHRUs. The CPF-1 Broach heater is a dual fuel-fired unit which could combust liquid fuel in an emergency. Because there is no difference in stack exit temperature and velocity between the two operating modes, the highest impacts predicted for a particular modeled averaging period is only dependent on the emission rate which is highest when combusting liquid fuel. Therefore, for the 3-hour and 24-hour averaging periods, impacts are highest assuming liquid fuel combustion. For the 1-hour averaging period, gaseous fuel combustion results in a higher modeled emission rate because liquid fuel is used for emergency operation and the resulting emission rate can be annualized. The annual modeled emission rate is highest assuming a maximum 500 hours per year combusting liquid fuel and the rest of the year combusting gaseous fuel. **Appendix C** presents a load screening analysis for the seven CPF-1 turbines which have operating WHRUs and will have variable stack exit conditions. While there are four other facility turbines with WHRUs, those WHRUs have not operated for over a decade and there is no plan to operate them in the foreseeable future. Therefore, these turbines were modeled as though they did not have a WHRU.
Restricted (non-vertical, capped, etc.) Stack Parameters are Described	With the exceptions noted in **Table 2-3**, all stacks were assumed to be non-capped with vertical releases.
Description of Modeled Source Types	All project emissions are released through exhaust stacks; therefore, all project sources were represented by point sources. Some of the offsite source groups were modeled as single volume source for the reasons discussed in **Appendix B**.

Checklist Element	Remarks
2.9 Pollutant Specific Modeling Issues	
PM Modeling – Description of Deposition Approach	Deposition modeling was not required or conducted.
$PM_{2.5}$ Modeling – Discussion of Secondary Impacts	$PM_{2.5}$ modeling was not required or conducted.
NO_2 Modeling – Description of NO_x to NO_2 Chemical Transformation Technique used.	NO_2 modeling was not required or conducted.
2.10 Building Downwash	
Description of how Building Downwash was Accounted for	The effects of plume downwash were considered for all project emission units except for those located at aggregated drill sites. Direction-specific building dimensions were calculated using the current version of the USEPA approved Building Profile Input Program BPIPPRM. Many building dimensions come from the 1992 PSD modeling but have been revised at the start of nearly every permitting action since that time. Like past projects, building dimensions were revisited for this project and revised to add new buildings and make slight adjustments to existing buildings to take advantage of more accurate information and mapping tools.
Scaled Plot of the Stationary Source	• For CPF-1 see **Figure 2-2** through **Figure 2-4**. • For DS1E see **Figure 2-5**. • For DS1J see **Figure 2-6**.
2.11 Ambient Air Boundary	
Description of the Ambient Boundary	For CPF-1, DS1E, and DS1J, the ambient boundary was set as the gravel pad edge consistent with ADEC guidance (ADEC 2018a). See **Figure 2-2** through **Figure 2-6**. The exception is the road located on the north side of the CPF-1 facility which is a primary access route and an area centrally located on the north part of the CPF-1 pad which has frequent public access and is identified on **Figure 2-2**. Both the road and public access area were modeled as ambient air and were established through collaboration with ADEC as part of modeling conducted to support permit AQ0267MSS07 which added two emergency generators to the source.

Checklist Element	Remarks
2.12 Receptor Grid	
Description of the Modeled Receptor Grid	Cartesian receptor grids were used with the following resolution: <u>For the CPF-1 near-field analysis:</u> • 25-meter receptor spacing along the ambient boundary, • 25-meter receptor grid representing the public access area within the CPF-1 pad boundary and the primary transportation road on the north side of the pad, • 25-meter receptor spacing from the ambient boundary out to 100 meters in each cardinal direction, • 100-meter receptor spacing from the 25-meter density grid out to 1.4 kilometers in each cardinal direction, and • 250-meter receptor spacing from the 100-meter density grid out to 2.5 kilometers in each cardinal direction. <u>For the DS1E and DS1J near-field analysis:</u> • 25-meter receptor spacing along the ambient boundary, • 25-meter receptor spacing from the ambient boundary out to 100 meters in each cardinal direction, and • 100-meter receptor spacing from the 25-meter density grid out to 0.9 kilometers in each cardinal direction. Maximum project impacts were predicted to occur on or near the ambient boundaries in the highest density grids and decreased in all directions away from the modeled facility until they became dominated by modeled offsite sources. At that point, project impacts were below the SILs and of no concern. This demonstrates that the modeling domain was large enough to show that the project impacts will not cause or contribute to a violation. *…Remark Continued on the Next Page*

Checklist Element	Remarks
Description of the Modeled Receptor Grid (continued)	*…Remark Continued from the Prior Page* To be sure the magnitude of maximum impacts were predicted, results were reviewed to determine if impacts of greater than 75 percent of an AAAQS or increment occurred in a coarser receptor grid. This occurred in one case. The CPF-1 near-field assessment 24-hour increment result exceeded 75 percent of the increment for a sole receptor in the 250-meter domain. However further review indicated this receptor is contained within the fine grid generated to assess impacts near the DS1E heater. Therefore, the receptor grid used with the DS1E near-field model run was of sufficient density to properly assess impacts in this area.
Description of how Modeled Receptor Elevations were Determined	The ground level elevation throughout the entire modeling domain was set to 0 meters to simulate the flat terrain in the project impact area. This is common practice for new source review modeling on the North Slope coastal plain.
Scaled Map Depicting Receptors Relative to the Ambient Boundary	See **Figure 2-7** through **Figure 2-10**.
2.13 Offsite Impacts	
Description of how Offsite Sources were Accounted for in the Analysis	Offsite sources previously described were modeled explicitly. All other offsite sources are represented in the cumulative impact analysis through the addition of a representative ambient background concentration.
Description of Modeled Offsite Source Exhaust Parameters	Modeled offsite source modeled parameters are described in **Appendix B**.
Description of Ambient Monitoring Data Demonstrating it is Representative and meets Applicable Quality Assurance Requirements	Representative ambient background concentrations utilized were obtained from data collected at the Kuparuk DS1F monitoring site during 2012 and 2013. The data were obtained from ADEC's May 22, 2018 Industrial Data Summary (ADEC 2018b) and are found in **Table 2-5**. The DS1F monitoring site is located only 4 kilometers southwest of CPF-1, 3 kilometers west of DS1E, and 7 kilometers northwest of DS1J. This monitoring site is impacted by the same types of regional sources and natural background as the project impact area. Additional details regarding data representativeness and quality can be found in **Appendix A**.
Description of Measurements Culled from the Ambient Monitoring Dataset	No measurements were culled from the ambient monitoring dataset.

Checklist Element	Remarks
Listing of Background Concentrations used to Represent non-Modeled Sources	See **Table 2-5** and **Appendix A**.
2.14 Design Concentrations	
Description of Modeled Output Compared to Applicable Thresholds	See **Section 3** of this document.
2.15 Post-Processing	
Description of Post-Processing	No post-processing was conducted.
2.16 Results and Discussion	
Tables of Model-Predicted Impacts	See **Table 3-1** through **Table 3-3** for a comparison of predicted cumulative impacts to the AAAQS. See **Table 3-4** through **Table 3-6** for a comparison of predicted cumulative impacts to the PSD Class II Increments.
Conclusions	See **Section 3** of this document.
2.17 Electronic Data	
Has Digital Data been Transmitted?	Modeling files (both input and output) has been transmitted electronically in a package separate from this analysis.

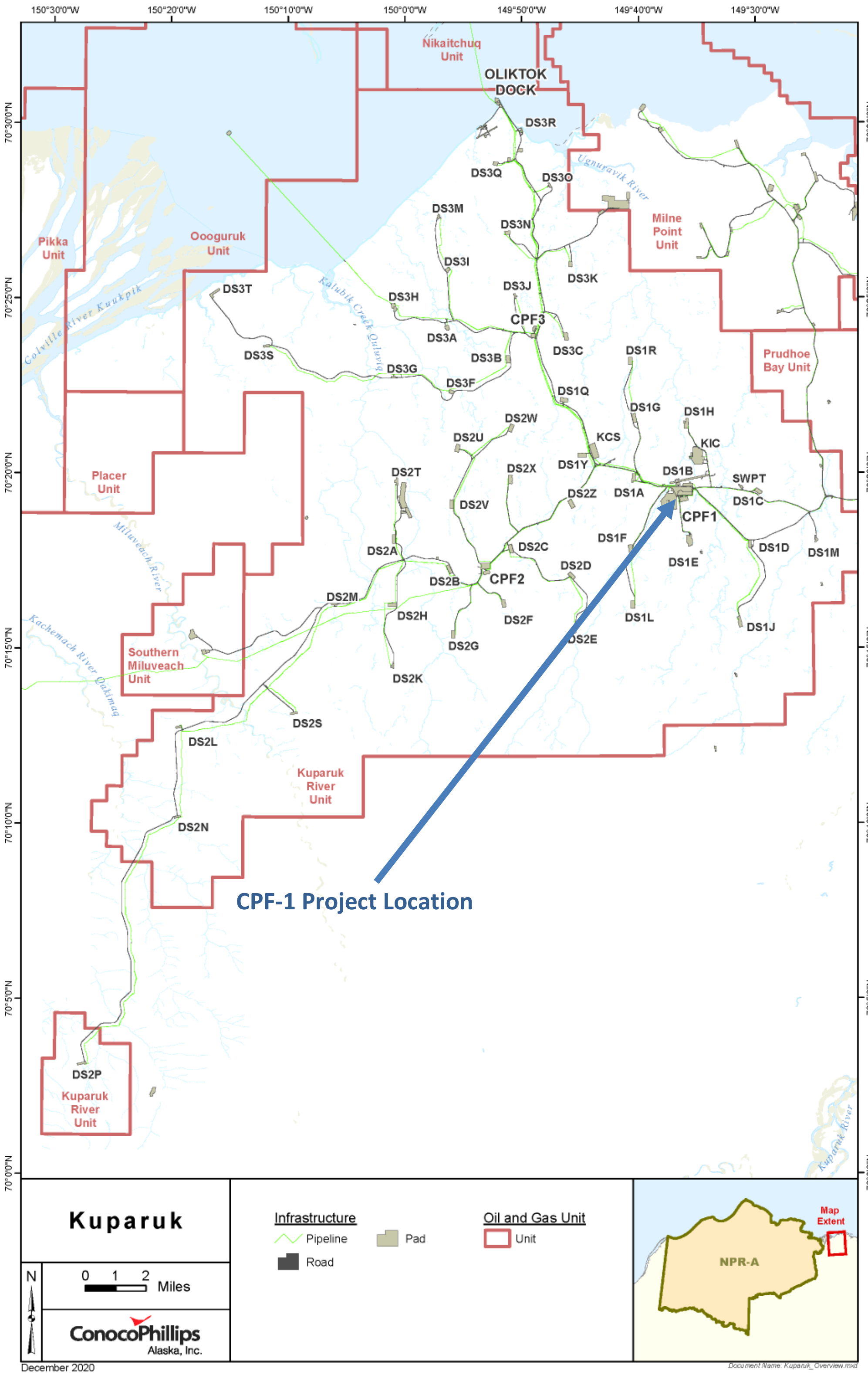

Figure 2-1 Project Location

Table 2-2 Description of Project Emission Units and Their Model Identifier (ID)

Equipment Tag #	AERMOD ID	Source Description	Notes
C-2101-A	C2101A1	GE/MS3002K-HE Gas Lift Compressor Turbine and associated WHRU	Bypass stack model ID
	C2101A2		WHRU stack model ID
C-2101-B	C2101B1	GE/MS3002K-HE Gas Lift Compressor Turbine and associated WHRU	Bypass stack model ID
	C2101B2		WHRU stack model ID
C-2101-C	C2101C1	GE/MS3002K-HE Gas Lift Compressor Turbine and associated WHRU	Bypass stack model ID
	C2101C2		WHRU stack model ID
G-201-A	G201A1	Ruston/TB5000 Generator Turbine and associated WHRU	Bypass stack model ID
	G201A2		WHRU stack model ID
G-201-B	G201B1	Ruston/TB5000 Generator Turbine and associated WHRU	Bypass stack model ID
	G201B2		WHRU stack model ID
G-201-C	G201C1	Ruston/TB5000 Generator Turbine and associated WHRU	Bypass stack model ID
	G201C2		WHRU stack model ID
G-201-D	G201D1	Ruston/TB5000 Generator and associated WHRU	Bypass stack model ID
	G201D2		WHRU stack model ID
G-3201-E	G3201E	Ruston/TB5000 Generator	-
G-3201-F	G3201F	Ruston/TB5000 Generator	-
P-2202-A	P2202A1	Ruston/TB5400 Water Injection Pump Turbine and associated WHRU	The WHRU has been decommissioned but left in the modeling with no emissions or flow.
	P2202A2		
P-2202-B	P2202B1	Ruston/TB5400 Water Injection Pump Turbine and associated WHRU	The WHRU has been decommissioned but left in the modeling with no emissions or flow.
	P2202B2		
P-CL07-A	PCL07A	Ruston/TB5400 Water Injection Pump Turbine	-
P-CL07-B	PCL07B	Ruston/TB5400 Water Injection Pump Turbine	-

Equipment Tag #	AERMOD ID	Source Description	Notes
E-CL06-A	ECL06A	Econotherm WHRU with Supplemental Firing associated with P-CL07-A	This unit has been decommissioned but left in the modeling with no emissions or flow.
E-CL06-B	ECL06B	Econotherm WHRU with Supplemental Firing associated with P-CL07-B	This unit has been decommissioned but left in the modeling with no emissions or flow.
H-201	H201L	Broach Heater Dual Fuel-Fired	Liquid-fired operation model ID
	H201G		Gas-fired operation model ID
G1-14-01	G11401	Born Topping Plant Crude Heater	-
H-250	H250	Solid Waste Incinerator	-
H-101B	H101B	McGill Flare	-
H-KF01	HKF01	Kaldair I-58-VS Flare	-
H-KF02	HKF02	Kaldair I-87-FS Flare	-
H-CR01A	HCR01A	McGill Flare	-
H-CR01B	HCR01B	McGill Flare	-
G-3203	G3203	GE Frame 6 (PG6561B) Combustion Turbine Generator	-
H-3204	H3204	Kvaerner Fuel Gas Heater	-
G-702-A	G702A	MTU 16V4000G83L Emergency Generator	-
G-702-B	G702B	MTU 16V4000G83L Emergency Generator	-
H-1A01	H1A01	Latoka Drill Site 1A Heater	-
H-1B01	H1B01	Latoka Drill Site 1B Heater	-
H-2V01	H2V01	CE Natco Drill Site 1C Heater	-
H-3F01	H3F01	CE Natco Drill Site 1D Heater	-
H-1F01	H1F01	BS&B Drill Site 1F Heater	-
H-1G01	H1G01	BS&B Drill Site 1G Heater	-
H-1F-1901	H1F1901	Latoka Drill Site 1H Heater	-
H-1Q01	H1Q01	BS&B Drill Site 1Q Heater	-

Equipment Tag #	AERMOD ID	Source Description	Notes
H-1R01	H1R01	BS&B Drill Site 1R Heater	-
H-1E02	H1E02	GTS Energy Production Heater Drill Site 1E Heater	-
H-1J01A	H1J01AB	Petrochem Development Production Heater Drill Site 1J Heater	Two heaters are installed on the drill site. For simplicity, they have been combined into a single modeled source.
H-1J01B		Petrochem Development Production Heater Drill Site 1J Heater	
P-1A02	-	Drill Site 1A GM Detroit Freeze Protection Pump Engine	These engines are all less than 300 hp and have not been modeled as previously discussed.
P-1F02	-	Drill Site 1F GM Detroit Freeze Protection Pump Engine	
P-1G02	-	Drill Site 1G GM Detroit Freeze Protection Pump Engine	
P-1L02	-	Drill Site 1L GM Detroit Freeze Protection Pump Engine	
P-1Q02	-	Drill Site 1Q GM Detroit Freeze Protection Pump Engine	
P-1R02	-	Drill Site 1R GM Detroit Freeze Protection Pump Engine	
P-1Y02	-	Drill Site 1Y GM Detroit Freeze Protection Pump Engine	
-	-	Drill Site 1B Cuttings Module Boiler	This is a small seasonally used boiler that has not been modeled as previously discussed.

Table 2-3 Modeled Source Parameters

AERMOD ID	Stack Exit Config.	Stack Location [a]			Modeled Stack Parameters [b]			
		Easting (m)	Northing (m)	Base Elev. (m)	Release Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
C2101A1	vertical	401858	7804102	1.5	25.9	740	20	1.83
C2101A2	vertical	401858	7804108	1.5	24.7	430	2	2.23
C2101B1	vertical	401841	7804103	1.5	25.9	740	20	1.83
C2101B2	vertical	401842	7804109	1.5	24.7	430	2	2.23
C2101C1	vertical	401825	7804104	1.5	25.9	740	20	1.83
C2101C2	vertical	401825	7804109	1.5	24.7	430	2	2.23
G201A1	vertical	401872	7804172	1.5	18.6	670	15	1.22
G201A2	vertical	401872	7804175	1.5	18.6	370	5	1.22
G201B1	vertical	401866	7804172	1.5	18.6	670	15	1.22
G201B2	vertical	401866	7804176	1.5	18.6	370	5	1.22
G201C1	vertical	401860	7804173	1.5	18.6	670	15	1.22
G201C2	vertical	401860	7804176	1.5	18.6	370	5	1.22
G201D1	vertical	401854	7804173	1.5	18.6	670	15	1.22
G201D2	vertical	401854	7804176	1.5	18.6	370	5	1.22
G3201E	vertical	401845	7804173	1.5	19.8	723	40.4	1.22
G3201F	vertical	401839	7804174	1.5	19.8	723	40.4	1.22
P2202A1	vertical	401985	7804122	1.5	21.8	736	41.5	1.10
P2202A2	vertical	401982	7804122	1.5	21.8	0	0	1.10
P2202B1	vertical	401985	7804114	1.5	21.8	736	41.5	1.10
P2202B2	vertical	401981	7804114	1.5	21.8	0	0	1.10
PCL07A	vertical	401984	7804139	1.5	25.3	736	41.5	1.77

AERMOD ID	Stack Exit Config.	Stack Location [a]			Modeled Stack Parameters [b]			
		Easting (m)	Northing (m)	Base Elev. (m)	Release Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
PCL07B	vertical	401984	7804132	1.5	25.3	736	41.5	1.77
ECL06A	vertical	401977	7804139	1.5	25.3	0	0	1.31
ECL06B	vertical	401977	7804133	1.5	25.3	0	0	1.31
H201L	vertical & **capped**	401905	7804152	1.5	23.2	491	7.62	0.914
H201G	vertical & **capped**	401905	7804152	1.5	23.2	491	7.62	0.914
G11401	vertical	402044	7804138	1.5	18.9	618	8.32	1.22
H250	vertical	401898	7804220	1.5	16	1144	6.49	1.22
H101B [b]	**horizontal**	402018	7803875	1.5	0.00 (0.00)	1273	20	0.706
HKF01 [b]	vertical	401924	7803861	1.5	10.7 (7.17)	1273	20	0.706
HKF02 [b]	vertical	401939	7803862	1.5	11.4 (7.86)	1273	20	0.706
HCR01A [b]	**horizontal**	401898	7803856	1.5	0.00 (0.00)	1273	20	0.706
HCR01B [b]	**horizontal**	402049	7803880	1.5	0.00 (0.00)	1273	20	0.706
G3203	vertical	401804	7804189	1.5	23.8	807	42.9	3.35
H3204	vertical	401802	7804103	1.5	23.6	728	8.02	0.457
G702A	vertical	402176	7804231	1.5	10.4	788	64.0	0.445
G702B	vertical	402175	7804219	1.5	10.4	788	64.0	0.445
H1A01	vertical	399595	7804924	1.5	15.9	450	8.20	0.800
H1B01	vertical	402440	7804394	1.5	15.9	450	8.20	0.800
H2V01	vertical	406167	7803867	1.5	10.4	450	8.20	0.800
H3F01	vertical	405605	7801093	1.5	10.0	450	8.20	0.800
H1F01	vertical	399255	7801122	1.5	10.0	450	8.20	0.800

AERMOD ID	Stack Exit Config.	Stack Location [a]			Modeled Stack Parameters [b]			
		Easting (m)	Northing (m)	Base Elev. (m)	Release Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
H1G01	vertical	399769	7808063	1.5	10.4	450	8.20	0.800
H1F1901	vertical	402508	7807577	1.5	15.9	450	8.20	0.800
H1Q01	vertical	396097	7809203	1.5	10.4	450	8.20	0.800
H1R01	vertical	399719	7811093	1.5	10.4	450	8.20	0.800
H1E02	vertical & **capped**	402413	7801433	1.5	10.3	576	7.19	1.16
H1J01AB	vertical & **capped**	404830	7797169	1.5	25.0	576	7.62	1.13

a Coordinates are UTM Zone 6, NAD 83.

b For vertical flares, the flare height listed is the effective height calculated based on recommendations from ADEC Modeling Guideline (ADEC 2018a). The actual flare stack height is shown in parenthesis. In the case of the horizontal flares, the effective stack was set equal to the actual release height for simplicity.

- Flare stack temperatures and velocities are values recommended by the ADEC Modeling Guideline (ADEC 2018a).
- Flare diameter is the effective diameter calculated on a per flare basis using the permitted combined limit of 1.6 MMscf/day split evenly among the five flares and calculated based on recommendations from the ADEC Modeling Guideline (ADEC 2018a).

Table 2-4 Modeled Emission Rates

AERMOD ID	Basis for Emission Rate [a]	SO₂ Emissions [a]					
		1-hour		3-hour & 24-hour		Annual	
		(lb/hr)	(g/s)	(lb/hr)	(g/s)	(tpy)	(g/s)
C2101A1	An analysis of operating data included in **Appendix C** shows that higher impacts will result in modeling more emissions through the WHRU stack. Conservatively representative operation apportions 55% of the flow through the WHRU. While these turbines operate under an annual ton per year group limit, turbine emissions were calculated as though the group limit does not exist.	7.45	0.422	7.45	0.422	32.6	0.422
C2101A2			0.516		0.516		0.516
C2101B1		7.45	0.422	7.45	0.422	32.6	0.422
C2101B2			0.516		0.516		0.516
C2101C1		7.45	0.422	7.45	0.422	32.6	0.422
C2101C2			0.516		0.516		0.516
G201A1	An analysis of operating data included in **Appendix C** shows that higher impacts will result in modeling more emissions through the WHRU stack. Conservatively representative operation apportions 50% of the flow through the WHRU. While these turbines operate under an annual ton per year group limit, turbine emissions were calculated as though the group limit does not exist.	2.37	0.149	2.37	0.149	10.4	0.149
G201A2			0.149		0.149		0.149
G201B1		2.37	0.149	2.37	0.149	10.4	0.149
G201B2			0.149		0.149		0.149
G201C1		2.37	0.149	2.37	0.149	10.4	0.149
G201C2			0.149		0.149		0.149
G201D1		2.37	0.149	2.37	0.149	10.4	0.149
G201D2			0.149		0.149		0.149
G3201E	While these turbines operate under an annual ton per year group limit, emissions were calculated as though the group limit does not exist.	2.37	0.299	2.37	0.299	10.4	0.299
G3201F		2.37	0.299		0.299	10.4	0.299

AERMOD ID	Basis for Emission Rate [a]	SO₂ Emissions [a]					
		1-hour		3-hour & 24-hour		Annual	
		(lb/hr)	(g/s)	(lb/hr)	(g/s)	(tpy)	(g/s)
P2202A1	While these turbines have WHRUs, the WHRUs have not operated recently. Therefore, all emissions are modeled through the bypass stacks consisted with current and projected future operation. While these turbines operate under an annual ton per year group limit, emissions were calculated as though the group limit does not exist.	2.53	0.319	2.53	0.319	11.1	0.319
P2202A2			0.000		0.000		0.000
P2202B1		2.53	0.319	2.53	0.319	11.1	0.319
P2202B2			0.000		0.000		0.000
PCL07A	While these turbines operate under an annual ton per year group limit, emissions were calculated as though the group limit does not exist.	2.53	0.319	2.53	0.319	11.1	0.319
PCL07B		2.53	0.319	2.53	0.319	11.1	0.319
ECL06A	These units have been decommissioned and are no longer on the permit.	0	0	0	0	0	0
ECL06B		0	0	0	0	0	0
H201**L**	Liquid-fired operations result in the highest short-term emissions. While this is the case, 1-hour emissions are based on combusting gas because for this averaging period, liquid fired operation emission rates can be annualized and would be lower.	7.44	NA	7.44	0.938	1.86	0.054
H201G		1.28	0.161	1.28	NA	5.28	0.152
G11401	While this heater operates under an annual ton per year group limit, emissions were calculated as though the group limit does not exist. This heater has a 162 ppmv H_2S fuel gas concentration NSPS limit. Regardless, modeled emissions assume 300 ppmv so that the facility will have a single ambient protection H_2S limit.	1.97	2.49	1.97	0.249	8.64	0.249
H250	-	1.79	0.226	1.79	0.226	7.58	0.218

AERMOD ID	Basis for Emission Rate [a]	SO_2 Emissions [a]					
		1-hour		3-hour & 24-hour		Annual	
		(lb/hr)	(g/s)	(lb/hr)	(g/s)	(tpy)	(g/s)
H101B	The 5 flares have a group rating. That rating and the resulting emissions are split evenly among the flares.	3.37	0.0850	3.37	0.0850	14.8	0.0850
HKF01			0.0850		0.0850		0.0850
HKF02			0.0850		0.0850		0.0850
HCR01A			0.0850		0.0850		0.0850
HCR01B			0.0850		0.0850		0.0850
G3203	This turbine has a 200 ppmv H_2S fuel gas concentration BACT limit. Regardless, modeled emissions assume 300 ppmv so that the facility will have a single ambient protection H_2S limit.	22.5	2.83	22.5	2.83	98.4	2.83
H3204	This heater has a 200 ppmv H_2S fuel gas concentration BACT limit. Regardless, modeled emissions assume 300 ppmv so that the facility will have a single ambient protection H_2S limit.	0.446	0.0562	0.446	0.0562	1.95	0.0562
G702A	Emergency engine – 500 hours per year. 1-hour g/s emission rates are annualized. lb/hr represents the potential to emit.	0.0363	0.000261	0.0363	0.00457	0.00908	0.000261
G702B	Emergency engine – 500 hours per year. 1-hour g/s emission rates are annualized. lb/hr represents the potential to emit.	0.0363	0.000261	0.0363	0.00457	0.00908	0.000261

AERMOD ID	Basis for Emission Rate [(a)]	SO₂ Emissions [(a)]					
		1-hour		3-hour & 24-hour		Annual	
		(lb/hr)	(g/s)	(lb/hr)	(g/s)	(tpy)	(g/s)
H1A01	While these heaters operate under an annual ton per year group limit, emissions were calculated as though the group limit does not exist.	1.26	0.158	1.26	0.158	5.51	0.158
H1B01		1.26	0.158	1.26	0.158	5.51	0.158
H2V01		1.11	0.140	1.11	0.140	4.87	0.140
H3F01		1.50	0.189	1.50	0.189	6.58	0.189
H1F01		1.14	0.144	1.14	0.144	5.00	0.144
H1G01		1.14	0.144	1.14	0.144	5.00	0.144
H1F1901		1.26	0.158	1.26	0.158	5.51	0.158
H1Q01		1.61	0.203	1.61	0.203	7.05	0.203
H1R01		1.32	0.166	1.32	0.166	5.78	0.166
H1E02	The heaters at drill sites 1E and 1J are included in a single 184 MMBtu/hr limit. The full limit is modeled at each site for simplicity and conservatism. In reality, DS1E only has a single 30 MMBtu/hour heater and DS1J only has two 36.8 MMBtu/hour heaters.	12.8	1.61	12.8	1.61	56.0	1.61
H1J01AB			1.61		1.61		1.61

a lb/hr and ton/yr emission rates are detailed in permit application Attachment C (Emissions Summary Form) and Attachment G (Emissions Calculations Spreadsheet). The emissions rates used in the modeling are given in g/s.

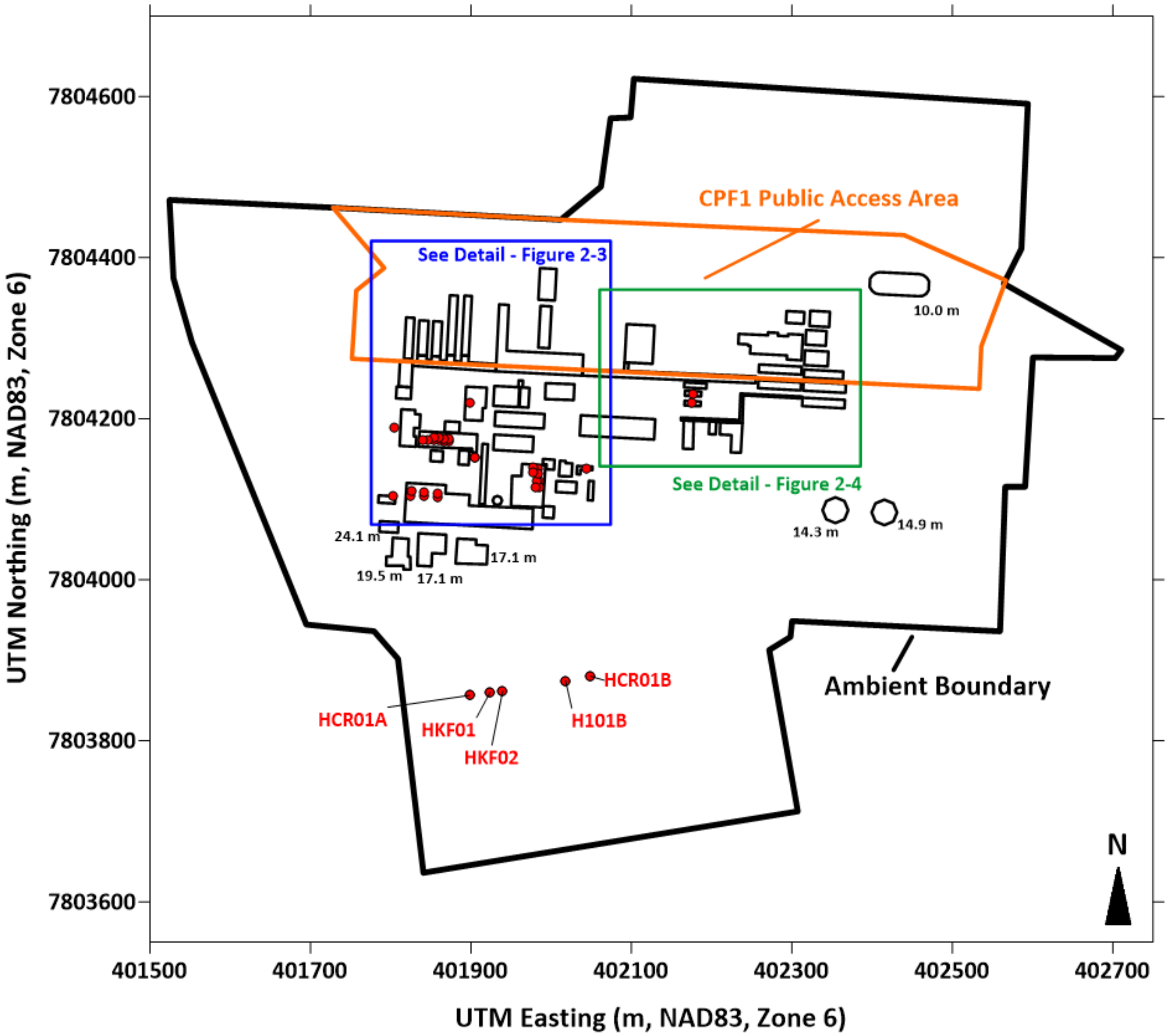

Figure 2-2 CPF-1 Pad Source and Building Configuration (UTM Zone 6, NAD83)

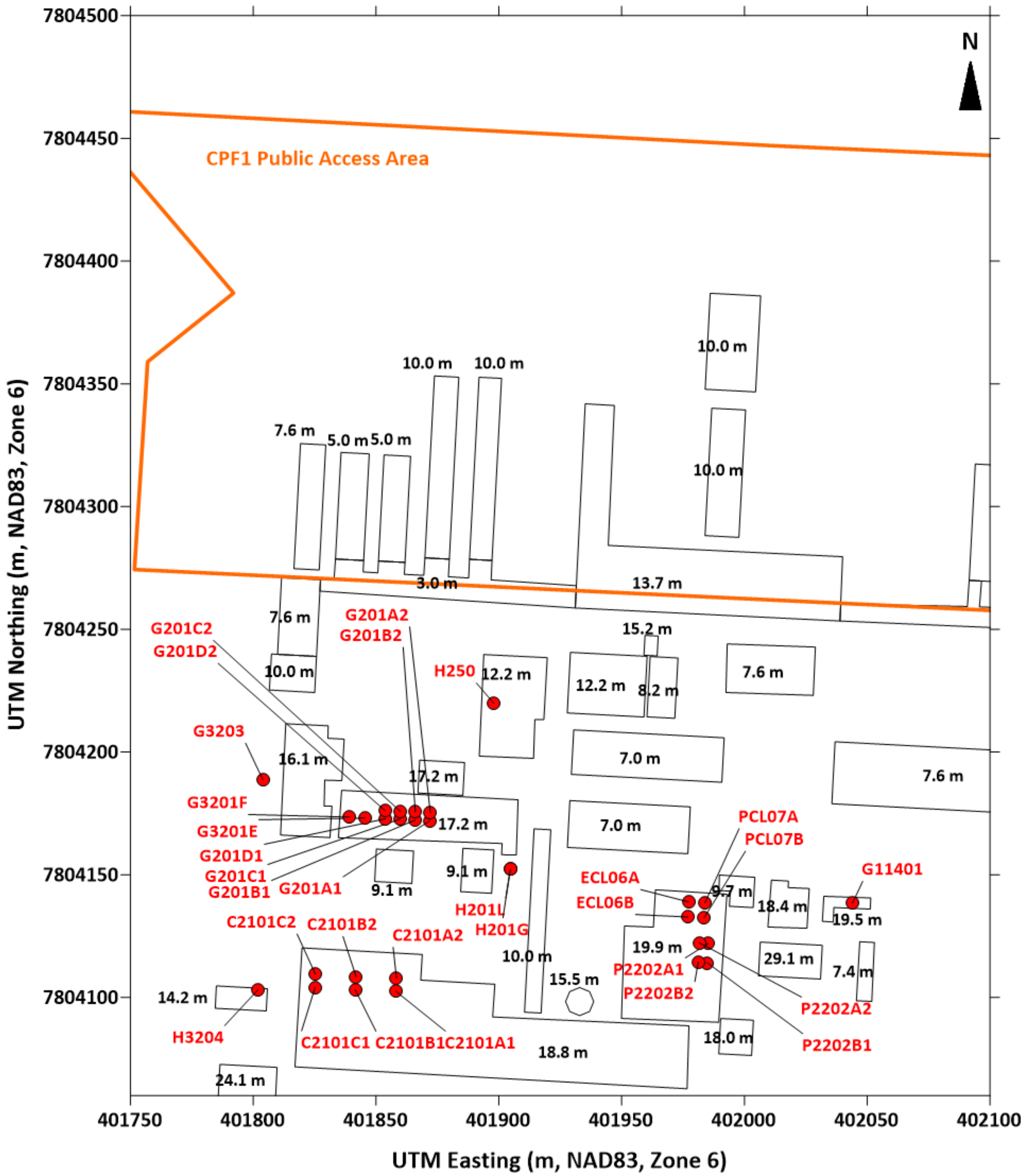

Figure 2-3 CPF-1 Pad Source and Building Configuration (Zoom Left) (UTM Zone 6, NAD83)

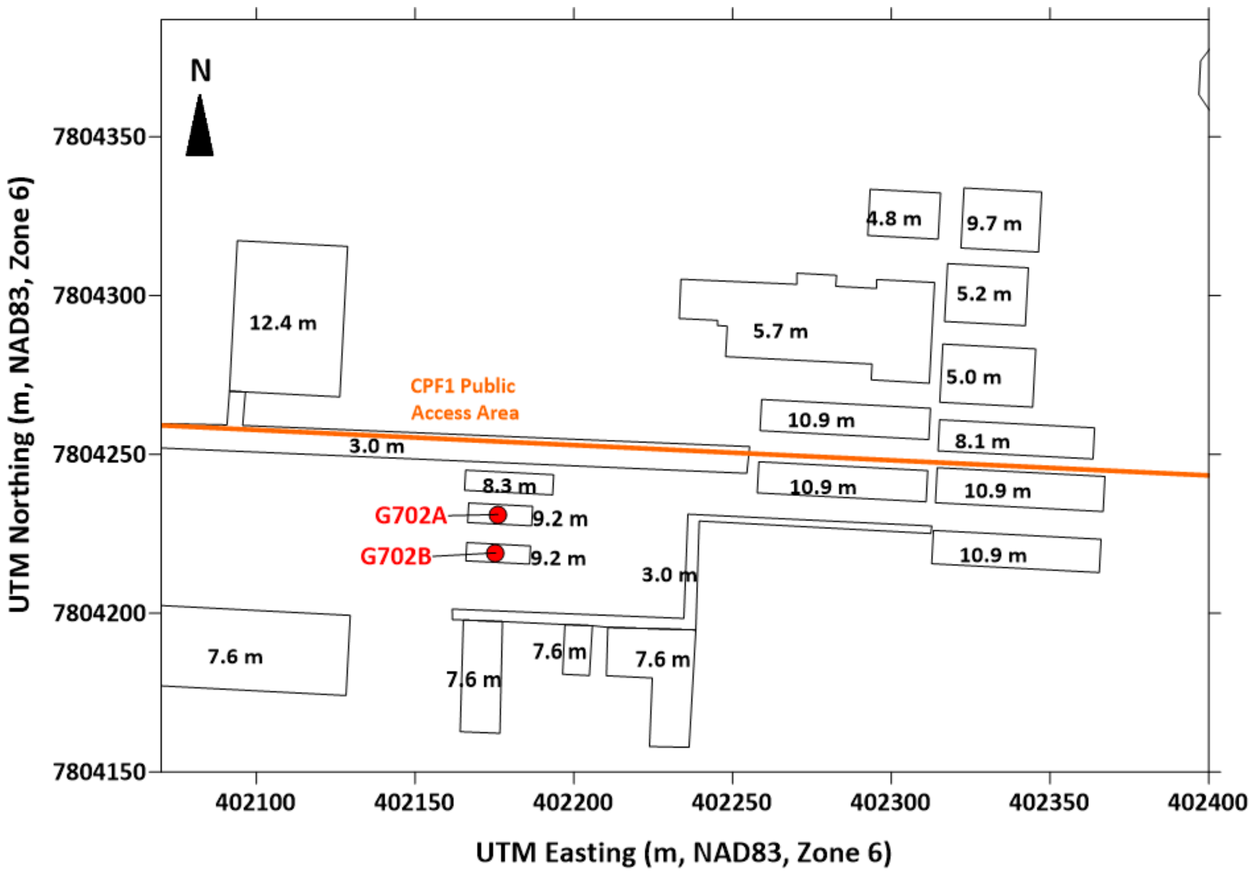

Figure 2-4 CPF-1 Pad Source and Building Configuration (Zoom Right) (UTM Zone 6, NAD83)

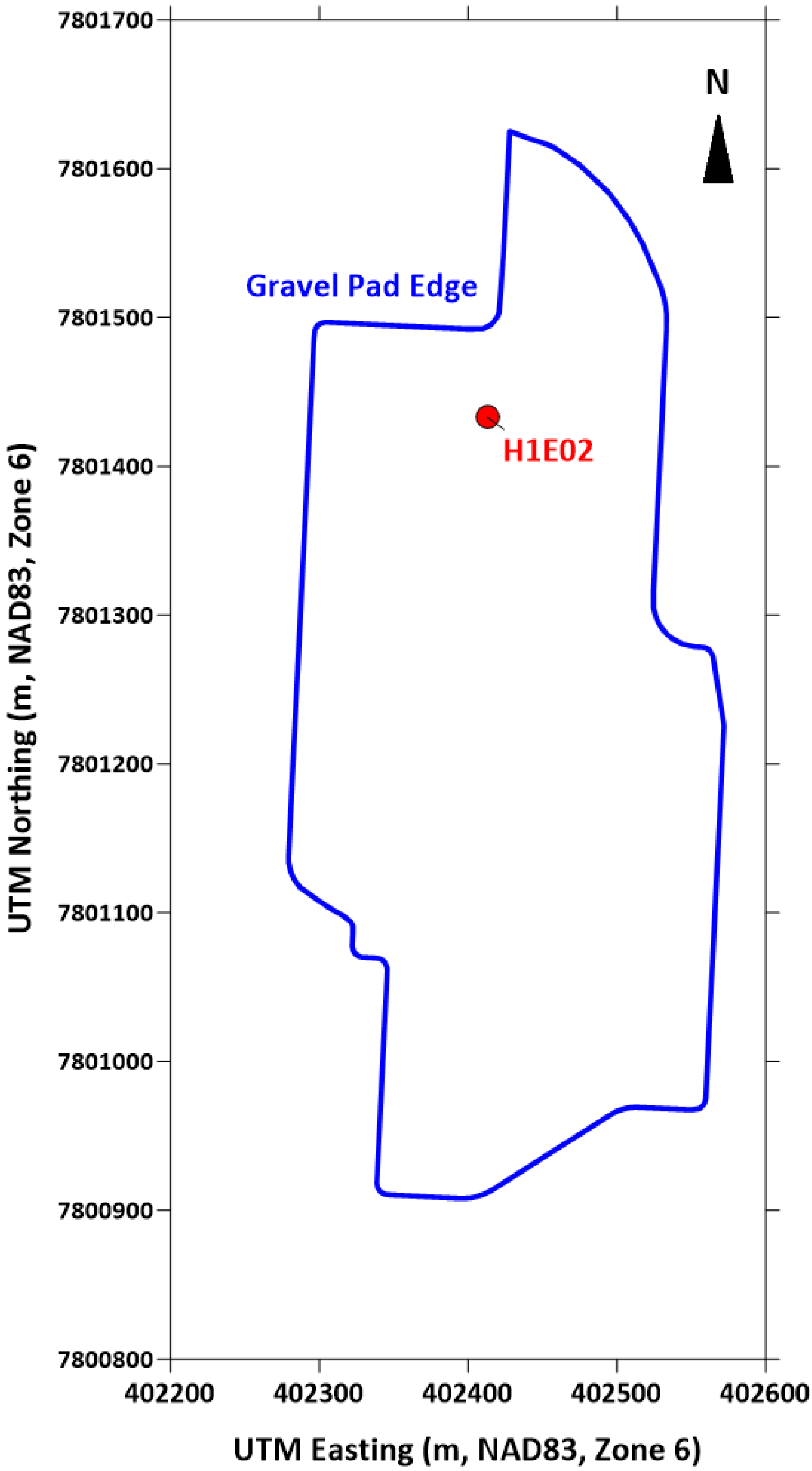

Figure 2-5 DS1E Pad Source and Building Configuration (UTM Zone 6, NAD83)

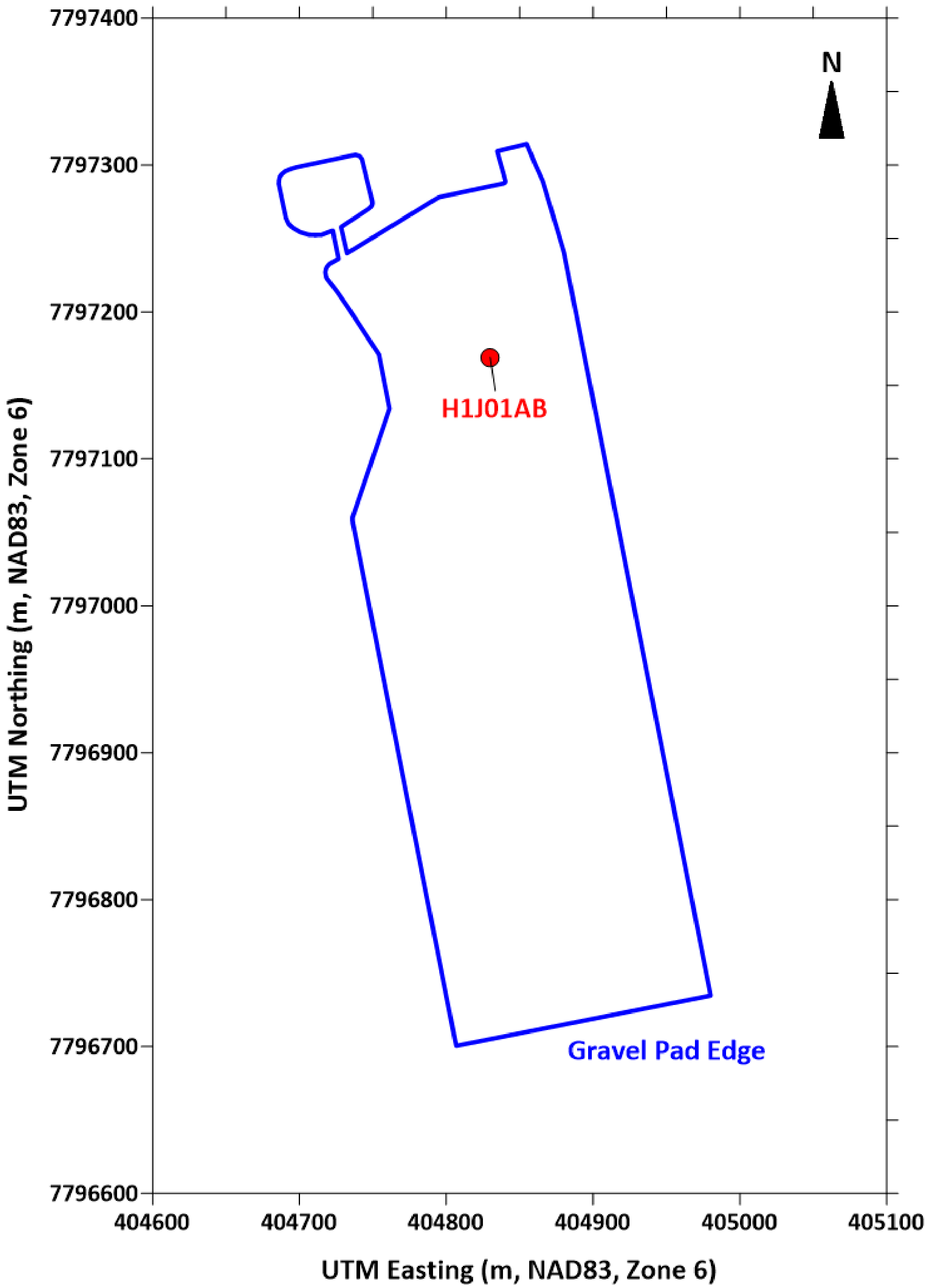

Figure 2-6 DS1J Pad Source and Building Configuration (UTM Zone 6, NAD83)

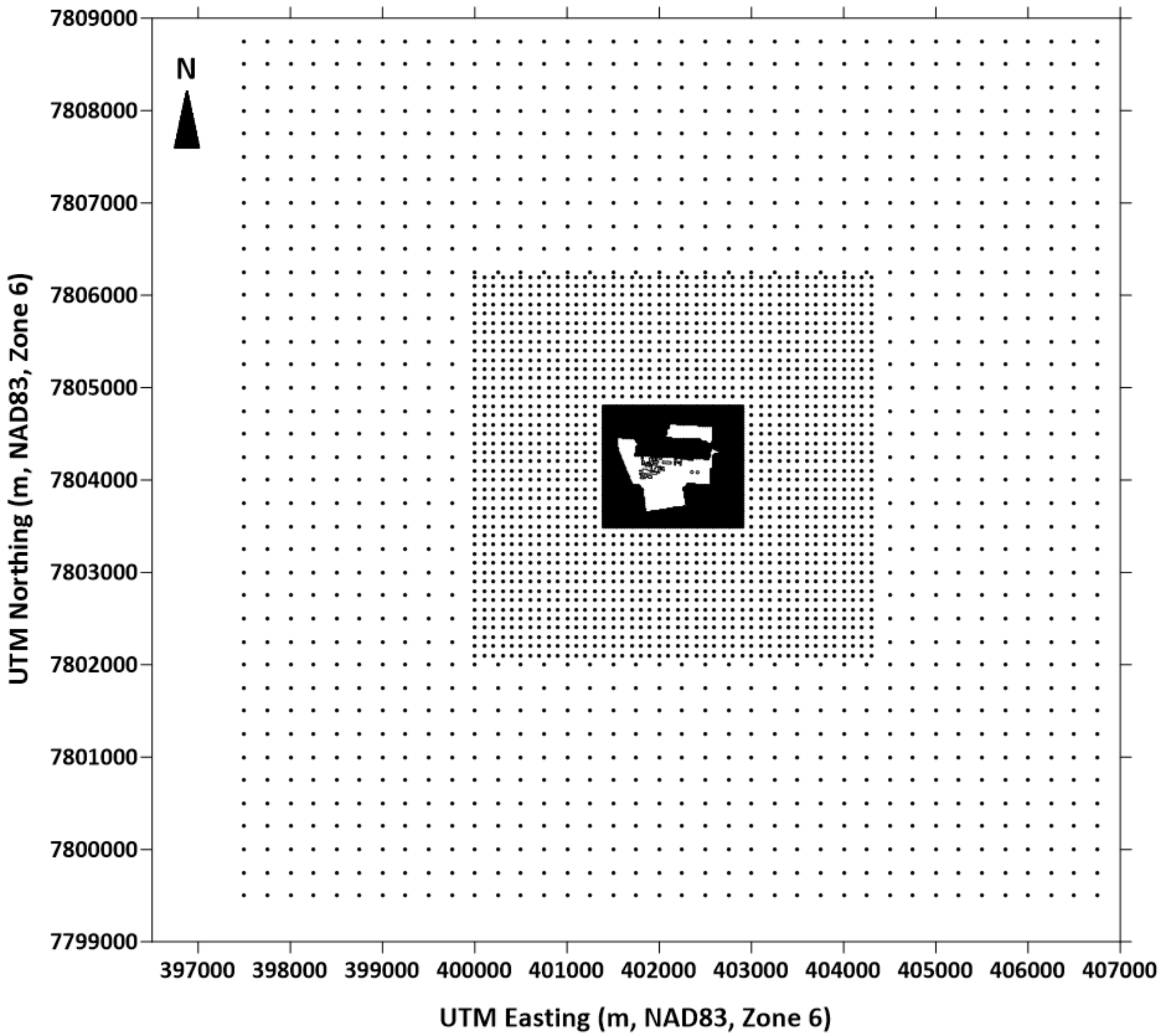

Figure 2-7 Far-Field Modeling Receptor Grid (UTM Zone 6, NAD83)

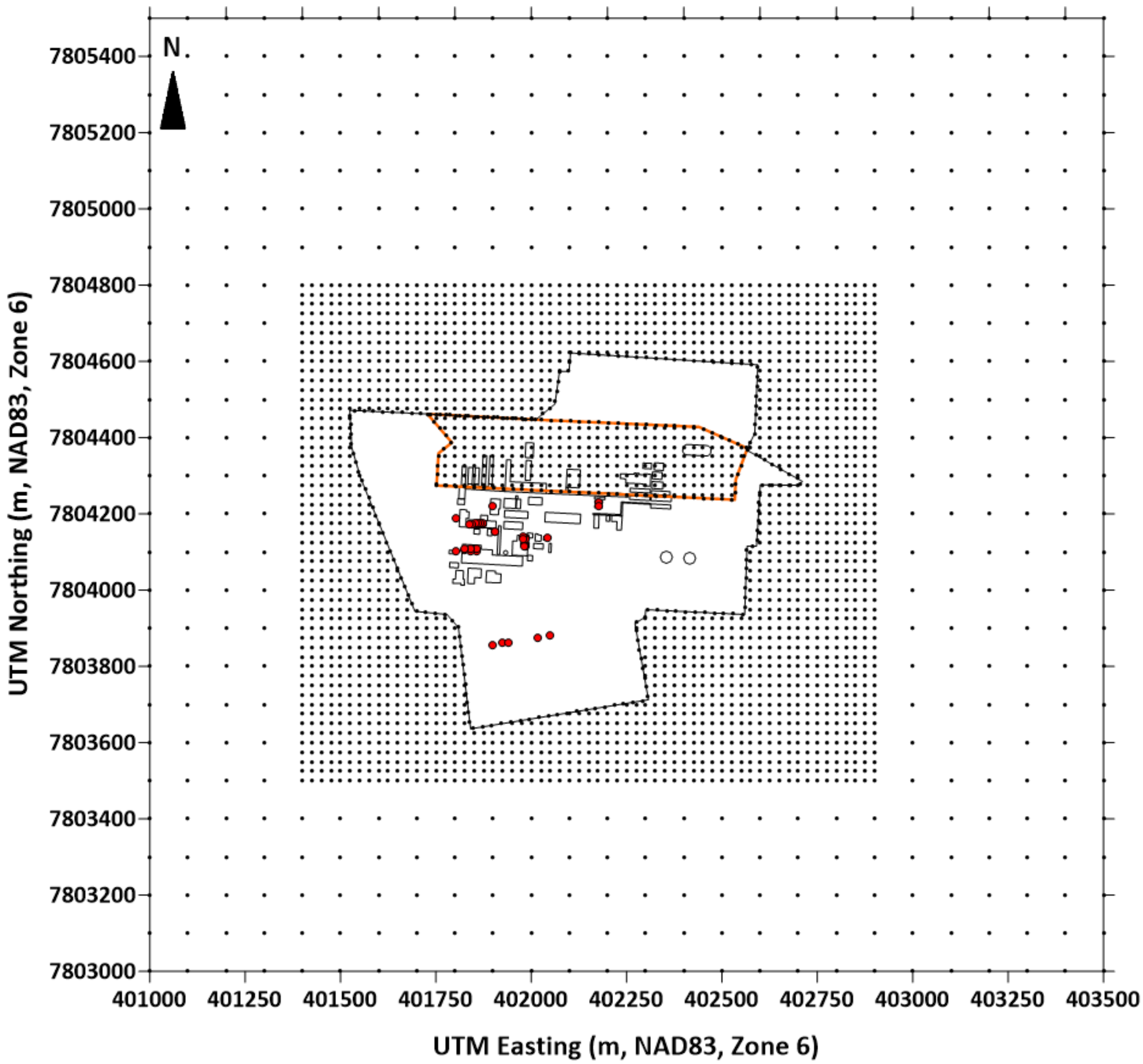

Figure 2-8 CPF-1 Near-Field Modeling Receptor Grid (UTM Zone 6, NAD83)

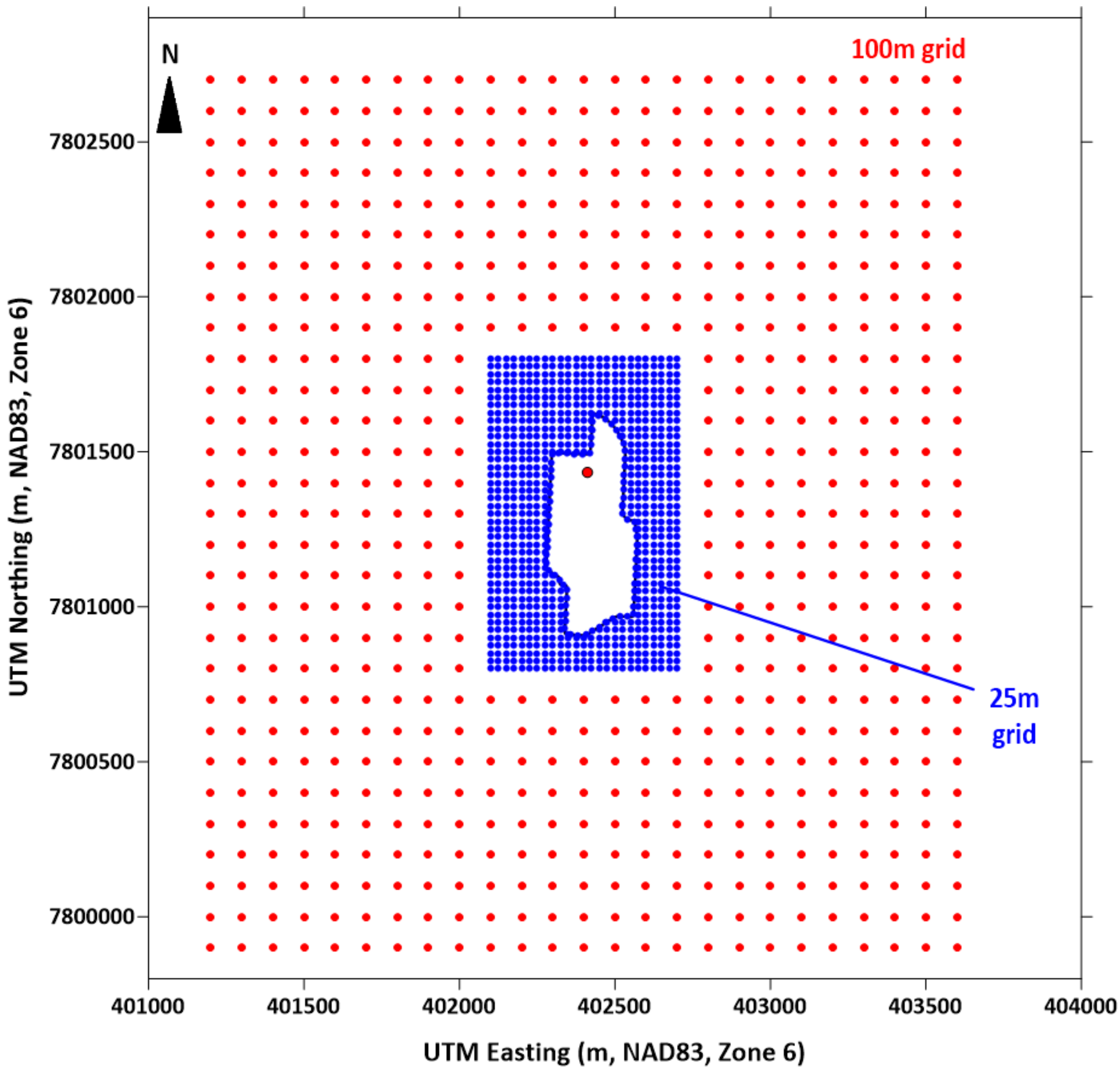

Figure 2-9 DS1E Near-Field Modeling Receptor Grid (UTM Zone 6, NAD83)

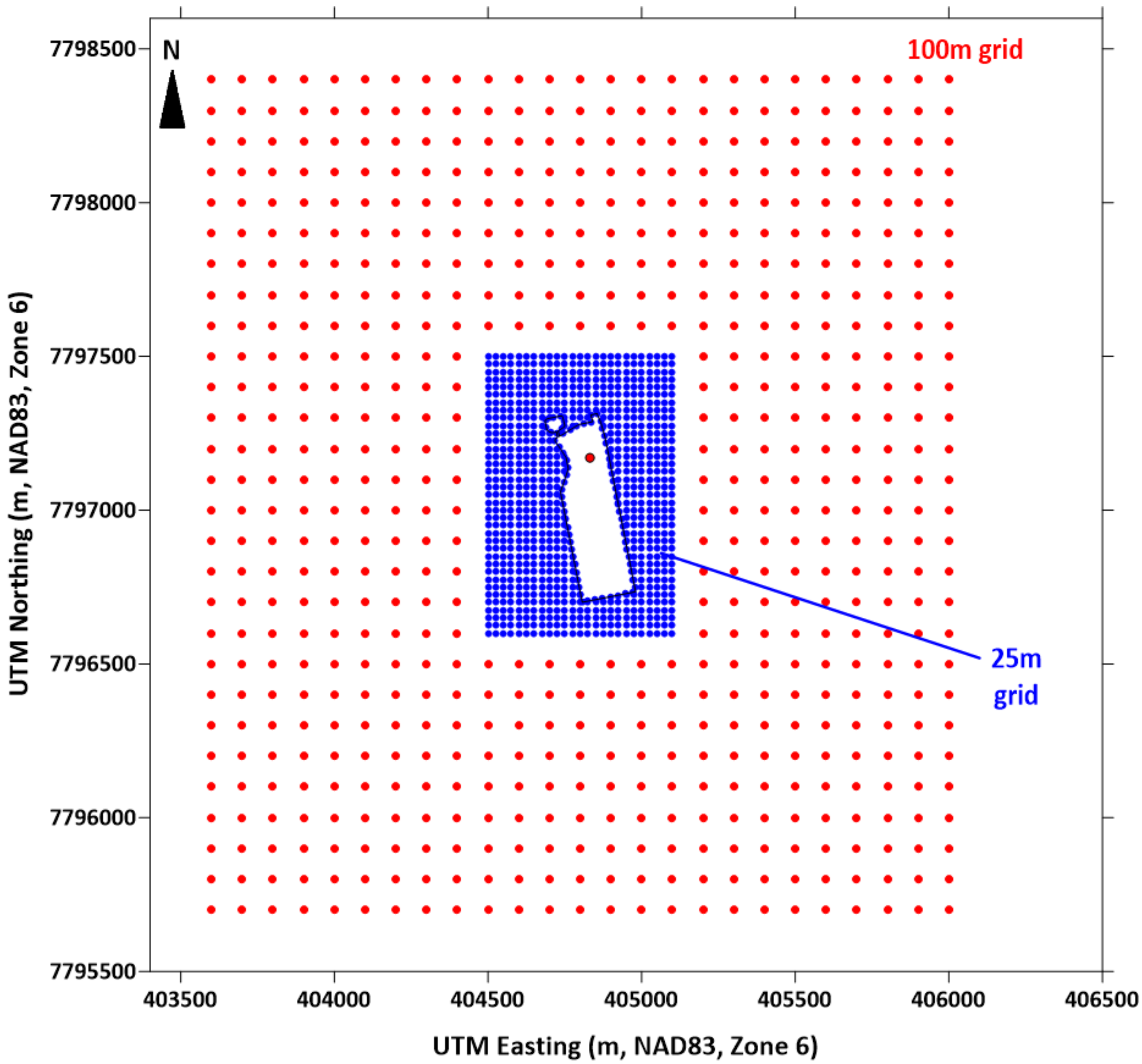

Figure 2-10 DS1J Near-Field Modeling Receptor Grid (UTM Zone 6, NAD83)

Table 2-5 Ambient Background Concentrations

Pollutant	Averaging Period	Ambient Background ($\mu g/m^3$) [(a)]	Rank of Background Value
SO_2	1-hour	6.0	99th percentile of daily maximum hourly values
	3-hour	5.5	Highest second high of hourly values
	24-hour	2.9	Highest second high of hourly values
	Annual	0.3	Annual average of hourly values

a All concentrations are compiled from ADEC's Industrial Data Summary (ADEC 2018b) for the Kuparuk DS1F 2012-2013 dataset.

3. RESULTS AND CONCLUSIONS

Three separate near-field analyses were conducted for this assessment to confirm compliance with applicable standards and increments at the main CPF-1 facility and its aggregated drill sites: a near-field analysis around CPF-1, DS1E, and DS1J. The results of those separate assessments are described in this section.

Cumulative model-predicted concentrations for CPF-1, DS1E, and DS1J are presented in **Table 3-1**, **Table 3-2**, and **Table 3-3**, respectively. These were added to background concentrations and compared to applicable AAAQS. Similarly, cumulative model-predicted concentrations for CPF-1, DS1E, and DS1J, respectively are compared to Class II PSD Increments in **Table 3-4**, **Table 3-5**, and **Table 3-6**. In all cases, the predicted impacts for all averaging periods show compliance with all applicable standards and increments.

While CPF-1 has various BACT, NSPS, and Permit Classification Avoidance Limits that apply on an emission unit-specific basis, this analysis shows that for SO_2, only two limits are required to protect ambient air quality: 1) a limit of 300 ppmv H_2S in the fuel gas applicable to emission units located on the CPF-1 pad, and 2) a limit of 500 ppmv H_2S in the fuel gas applicable to emission units located at the drill sites aggregated with the CPF-1 stationary source.

Table 3-1 CPF-1 Near-Field Analysis - Modeled-Predicted Cumulative SO_2 Concentrations Compared to the AAAQS

Averaging Period	Rank	AERMOD Predicted Design Value (µg/m³)	Ambient Background (µg/m³)	Total (µg/m³)	AAAQS (µg/m³)	% of AAAQS
1-hour	99th %tile [(a)]	173	6.0	179	196	91
3-hour	H2H [(b)]	229	5.5	234	1300	18
24-hour	H2H [(b)]	83.4	2.9	86.3	365	24
Annual	Max. Annual Mean [(c)]	11.9	0.30	12.2	80	15

a 99th Percentile of the 1-hour daily maximum impact averaged over 3-years.

b Maximum of the highest-second-high concentration obtained from each of the 3 modeled years.

c Maximum of the annual mean concentration obtained from each of the 3 modeled years.

Table 3-2 DS1E Near-Field Analysis - Modeled-Predicted Cumulative SO_2 Concentrations Compared to the AAAQS

Averaging Period	Rank	AERMOD Predicted Design Value (µg/m^3)	Ambient Background (µg/m^3)	Total (µg/m^3)	AAAQS (µg/m^3)	% of AAAQS
1-hour	99th %tile [(a)]	126	6.0	132	196	67
3-hour	H2H [(b)]	168	5.5	173	1300	13
24-hour	H2H [(b)]	83.9	2.9	86.8	365	24
Annual	Max. Annual Mean [(c)]	4.63	0.30	4.93	80	6.2

a 99th Percentile of the 1-hour daily maximum impact averaged over 3-years.

b Maximum of the highest-second-high concentration obtained from each of the 3 modeled years.

c Maximum of the annual mean concentration obtained from each of the 3 modeled years.

Table 3-3 DS1J Near-Field Analysis - Modeled-Predicted Cumulative SO_2 Concentrations Compared to the AAAQS

Averaging Period	Rank	AERMOD Predicted Design Value (µg/m^3)	Ambient Background (µg/m^3)	Total (µg/m^3)	AAAQS (µg/m^3)	% of AAAQS
1-hour	99th %tile [(a)]	38.3	6.0	44.3	196	23
3-hour	H2H [(b)]	41.8	5.5	47.3	1300	3.6
24-hour	H2H [(b)]	15.6	2.9	18.5	365	5.1
Annual	Max. Annual Mean [(c)]	1.37	0.30	1.67	80	2.1

a 99th Percentile of the 1-hour daily maximum impact averaged over 3-years.

b Maximum of the highest-second-high concentration obtained from each of the 3 modeled years.

c Maximum of the annual mean concentration obtained from each of the 3 modeled years.

Table 3-4 CPF-1 Near-Field Analysis - Modeled-Predicted Cumulative SO_2 Concentrations Compared to Class II PSD Increments

Averaging Period	Rank	AERMOD Predicted Design Value (µg/m³)	Class II PSD Increment (µg/m³)	% of Increment
3-hour	H2H [a]	229	512	45
24-hour	H2H [a]	83.4	91	92
Annual	Max. Annual Mean [b]	11.9	20	60

a Maximum of the highest-second-high concentration obtained from each of the 3 modeled years.

b Maximum of the annual mean concentration obtained from each of the 3 modeled years.

Table 3-5 DS1E Near-Field Analysis - Modeled-Predicted Cumulative SO_2 Concentrations Compared to Class II PSD Increments

Averaging Period	Rank	AERMOD Predicted Design Value (µg/m³)	Class II PSD Increment (µg/m³)	% of Increment
3-hour	H2H [a]	168	512	33
24-hour	H2H [a]	83.9	91	92
Annual	Max. Annual Mean [b]	4.63	20	23

a Maximum of the highest-second-high concentration obtained from each of the 3 modeled years.

b Maximum of the annual mean concentration obtained from each of the 3 modeled years.

Table 3-6 DS1J Near-Field Analysis - Modeled-Predicted Cumulative SO_2 Concentrations Compared to Class II PSD Increments

Averaging Period	Rank	AERMOD Predicted Design Value (µg/m³)	Class II PSD Increment (µg/m³)	% of Increment
3-hour	H2H [a]	41.8	512	8.2
24-hour	H2H [a]	15.6	91	17
Annual	Max. Annual Mean [b]	1.37	20	6.9

a Maximum of the highest-second-high concentration obtained from each of the 3 modeled years.

b Maximum of the annual mean concentration obtained from each of the 3 modeled years.

4. REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2018a. ADEC. Modeling Review Procedures Manual. October 8, 2018.

Alaska Department of Environmental Conservation (ADEC), 2018b. ADEC Division of Air Quality Air Permit Program – Permit Information; Industrial Data Summary 05/22/2018.xlsx. Last Revised May 22, 2018. Available online: http://dec.alaska.gov/air/ap/mainair.htm. Accessed May 2020.

Alaska Department of Environmental Conservation (ADEC), 2017. Air Quality Modeling Submittal Checklist – Minor Permit Applications, 2017. ADEC. Version 1.0. October 24, 2017. Available online: https://dec.alaska.gov/media/10232/model-submittal-checklist-minor-102417.pdf. Accessed February 2020.

US Environmental Protection Agency (USEPA), 2020. 2017 National Emissions Inventory (NEI) Data – Data Summaries – Point Inventory. – 2017v1/2017neiApr_facility_process_byregions.zip. Available online: https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data. Accessed May 2020.

US Environmental Protection Agency (USEPA), 2017. Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. 40 CFR 51. January 17, 2017.

APPENDIX A

DESCRIPTION OF AMBIENT BACKGROUND DATA

Cumulative Ambient Air Quality Impact Assessment

ConocoPhillips Alaska, Inc.
May 2021

Introduction

This appendix discusses the use of ambient monitoring data collected between July 1, 2012 and June 30, 2013 at CPAI's Kuparuk Drill Site 1F Monitoring Station[1] to develop representative background concentrations to combine with model-predicted impacts for the CPF-1, DS1E, and DS1J cumulative modeling demonstration. Drill Site 1F is an active well pad located approximately 4 kilometers southwest of CPF-1 and aligned with the prevailing winds downwind of CPF-1. Therefore, impacts from CPF-1 may be part of the background concentrations.

For a cumulative impact analysis, representative ambient background concentrations must be developed to combine with model-predicted impacts to account for any non-modeled emission sources. According to Section 8.3.1 of the Guideline on Air Quality Models (USEPA 2017), background concentrations should be representative of the following in the vicinity of the source(s) under consideration:

- Nearby sources, other than the sources(s) currently under consideration and other source(s) that are explicitly modeled; and
- Other sources, including natural sources, unidentified sources, and regional transport.

Concentrations derived from ambient data collected at the Drill Site 1F Monitoring Station were used because these background SO_2 concentrations are representative of the inventory of nearby and other non-modeled sources in the vicinity of CPF-1 and its drill sites. However, because of the age of this data, additional consideration is given to the development of the modeling demonstration using these background concentrations.

Nearby Sources

There are no emission sources expected to be near enough to cause a significant concentration gradient in the impact area of CPF-1, DS1E, and DS1J. The closest drill site with a stationary source (Drill Site 1A) to CPF-1 is located approximately 2.5 kilometers away, and the nearest PSD major facilities (CPF-2 and CPF-3) are located over 11 kilometers from the CPF-1. Furthermore, none of the drill sites are located within 3 kilometers of each other and both DS1E and DS1J are located more than 2.5 kilometers from the nearest PSD major facility (CPF-1). However, given that this ambient data was collected approximately seven years ago, it may not be representative of more recent changes in North Slope operations, such as changing sulfur content in combusted fuels. Increasingly over recent years, regional North Slope operations have been transitioning to lower sulfur liquid fuels, such as ultra-low sulfur diesel (ULSD), but also higher sulfur gaseous fuels, due to the souring of gas reservoirs.

To account for these more recent potential changes in SO_2 concentrations, permitted large regional stationary sources have been explicitly modeled as offsite sources. The characterization of these sources is discussed in **Appendix B**. This approach is conservative because any impacts predicted from these offsite sources in the vicinity of CPF-1, DS1E, or DS1J will also be added to background concentrations developed

[1] Between July 1, 2012 and June 30, 2013, the Drill Site 1F Monitoring Station collected PSD-quality meteorological data and ambient concentration measurements of CO, NO_x, NO_2, NO, O_3, SO_2, $PM_{2.5}$, and PM_{10} in accordance with its approved QAPP. The QAPP for the Kuparuk Ambient Air and Meteorological Monitoring Program was approved by ADEC on September 28, 2012.

from the Drill Site 1F ambient SO_2 data. The bimodal winds on the North Slope make the Drill Site 1F Monitoring Station frequently downwind of some of these explicitly modeled facilities, such as CPF-2 and CPF-3, thus making some of these SO_2 impacts potentially double-counted.

As an active drill site, the Drill Site 1F ambient data also includes impacts from near-field mobile and stationary emission sources operating at the drill site, including a freeze protection pump, a production heater, drill rigs, well servicing equipment, mobile sources, and other portable and temporary equipment supporting oil and gas operations. This makes it representative of these types of nonmodeled sources at DS1E, DS1J, and DS1B which is located across the Spine road from CPF-1.

Other Sources

The Drill Site 1F Monitoring Station is centrally located among regional oil and gas development on the North Slope and is downwind of several major facilities within the Kuparuk River Unit, as well as more far-field sources in the Prudhoe Bay Unit, Colville River Unit, and other North Slope operating units. The location of the Drill Site 1F Monitoring Station ensures that the station captures regional impacts from minor stationary, major stationary, and mobile transportation sources associated with regional oil and gas development, including impacts from processing facilities, power stations, drill rigs, well servicing activities, and other temporary and mobile sources supporting well pad development and maintenance.

Given the Drill Site 1F Monitoring Station's location on the North Slope and within the Kuparuk River Unit, the Drill Site 1F ambient SO_2 data should be impacted by the same types of regional non-modeled sources as the CPF-1. Therefore, the Drill Site 1F ambient SO_2 data is representative of impacts at CPF-1, DS1E, and DS1J from other non-modeled sources, including regional oil and gas development activity, biogenic, unidentified, and globally transported emissions throughout the North Slope.

References

US Environmental Protection Agency (USEPA), 2017. Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter. 40 CFR 51. January 17, 2017.

APPENDIX B

DESCRIPTION OF MODELED OFFSITE SOURCES

Cumulative Ambient Air Quality Impact Assessment

ConocoPhillips Alaska, Inc.

May 2021

Introduction

This appendix provides additional information regarding the modeled offsite source inventory that was included in the dispersion modeling analysis. As mentioned in **Appendix A**, given that the ambient background data from the Drill Site 1F Monitoring Station being used in the analysis was collected approximately eight years ago, it may not be representative of impacts from more recent SO_2 emissions resulting from changing sulfur content in combusted fuels due to the souring of gas reservoirs. Therefore, permitted regional stationary sources within at least 20 kilometers of CPF-1 were modeled as offsite sources to account for these more recent potential changes in SO_2 concentrations. **Table B-1** presents the modeled offsite sources.

These offsite sources are not considered Nearby Sources and would not typically be explicitly included in a CPF-1 ambient air quality impact assessment since they are not expected to be near enough to cause a significant concentration gradient in the impact area of CPF-1. The purpose of including them in the dispersion modeling is solely to elevate the ambient background concentrations. Considering this and with a goal of a simplified but reasonably conservative source characterization, the offsite sources were modeled as single volume sources representing the total facility emissions. Using a volume source simplifies the characterization because it captures the plume downwash and elevated emissions release attributable to all facility emission units in one modeled source but is more conservative than using point sources because mechanical momentum due to stack exit velocity and thermal buoyancy are not considered. Furthermore, concentrating the source of emissions by assuming plumes are collocated out of a single volume at each facility results in higher far-field concentrations in the vicinity of CPF-1 compared to spreading emissions out over numerous point sources achieving the intended purpose which is to simulate an elevated background concentration attributable to these sources near CPF-1. Modeling these offsite sources as volumes provides a conservative addition to modeled impacts that, when added to ambient SO_2 concentrations from Drill Site 1F, prudently accounts for regional background concentrations that are required for the SO_2 AAAQS compliance demonstration.

Each volume source was identically sized as 100-meter length x 100-meter width x 15-meter release height. These dimensions correspond to the approximate footprint of the general collection of buildings associated with the modeled offsite facilities and was designed to approximate the downwash and merged plumes originating from the collection of facility sources. Facility locations and annual emissions were obtained from the 2017 National Emissions Inventory (NEI) (USEPA 2020). Short-term emission rates (≤ 24 hours) are assumed to be equal to the annual emission rates. **Table B-2** presents the modeled volume source parameters.

Table B-1 Offsite Sources Included in the AQIA

Source Owner	Source Name	Source ID	Emission Rate [a] (tpy)	Distance from CPF-1 (km)
ConocoPhillips Alaska, Inc.	CPF-3, Kuparuk Central Production Facility #1	CPF3	135	11
ConocoPhillips Alaska, Inc.	CPF-2, Kuparuk Central Production Facility #2	CFP2	83.9	11
ConocoPhillips Alaska, Inc.	Kuparuk Seawater Treatment Plant (STP)	KSTP	11.0	23
Hilcorp Alaska, LLC	Milne Point Production Facility (MPU)	MPU	11.0	16
eni US Operating Co. Inc.	Nikaitchuq Development	NIKD	6.1	23
eni US Operating Co. Inc.	Oooguruk Development Project	OOOGD	15.2	31

a Emission rates were obtained from 2017 NEI (USEPA 2020).

Table B-2 Modeled Offsite Source Parameters

Source ID	Source Coordinates [a], [b]		Elevation (m)	Emission Rate [b], [c] (g/sec)	Release Height (m)	Sigma-Y [d] (m)	Sigma-Z [d] (m)
	Easting (m)	Northing (m)					
CPF3	394567	7812823	1.5	3.89E+00	15	23.26	6.98
CFP2	391461	7800749	1.5	2.41E+00	15	23.26	6.98
KSTP	393243	7825503	1.5	3.15E-01	15	23.26	6.98
MPU	408890	7818712	1.5	3.15E-01	15	23.26	6.98
NIKD	393442	7825136	1.5	1.74E-01	15	23.26	6.98
OOOGD	378922	7824381	0.0	4.38E-01	15	23.26	6.98

a Coordinates are UTM Zone 6, NAD 83.

b Obtained from 2017 NEI (USEPA 2020).

c Short-term emission rates (≤ 24 hours) assumed to be equal to annual emission rate.

d Sigma-y = 100-m source length divided by 4.3 = 23.26 m.

Sigma-z = 15-m vertical dimension divided by 2.15 = 6.98 m (USEPA 2018).

References

US Environmental Protection Agency (USEPA), 2020. 2017 National Emissions Inventory (NEI) Data – Data Summaries – Point Inventory. – 2017v1/2017neiApr_facility_process_byregions.zip. Available online: https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data. Accessed May 2020.

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APPENDIX C

CPF-1 WASTE HEAT RECOVERY UNITS – STACK PARAMETER DEVELOPMENT

Cumulative Ambient Air Quality Impact Assessment

ConocoPhillips Alaska, Inc.
May 2021

Introduction

This appendix provides a summary of the analysis conducted to determine stack parameters to use when modeling the CPF-1 turbines with operating waste heat recovery units (WHRUs). This analysis was necessary so that a single set of parameters could be modeled from among the range of potential stack exit conditions that occur for the WHRU and bypass stacks for each of these units. This analysis focuses on determining representative WHRU and bypass stack exit temperature, velocity, and mass flow split to model. Emission rates are based on potential to emit and assigned based on the mass flow split.

At CPF-1, turbines are the only type of emission unit that include WHRUs. The turbines with WHRUs are grouped into 2 categories based on service. The three GE/MS3002K-HE Gas Lift Compressor (GLC) turbines (Tag # C-2101-A, C-2101-B, and C-2101-C), and the four Ruston/TB5000 Power Generator (PG) turbines (Tag # G-201-A, G-201-B, G-201-C, and G-201-D). Except during maintenance or failures, the turbines in each group work together to contribute nearly equally to the same objective. Therefore, they will all have very similar operation. None of these WHRUs are equipped with supplemental firing systems.

In all cases, the total turbine exhaust is apportioned between the WHRU and bypass stacks using a damper installed in the exhaust stream downstream of the turbine. The WHRU stack includes a heat exchanger which transfers exhaust heat to a heat medium which is then used throughout the production facility. The bypass stack handles any exhaust flow not being channeled to the WHRU. Therefore, the physical properties of the flow through the bypass stack are unmodified. By contrast, an energy loss is experienced when heat is transferred to the heat exchanger in the WHRU stack, thereby resulting in a large reduction in exit temperature as well as volumetric flow.

Approach

Continuous hourly facility operations monitoring data collected during calendar years 2018 and 2019 was used to characterize relevant operating conditions for each bypass/WHRU stack combination. This data included turbine operating parameters necessary to calculate exhaust mass flow (fuel flow, inlet air temperature, etc.), exhaust damper position setting, bypass stack exhaust temperature, and bypass stack temperature before and after the heat exchanger. This data was cleaned to remove periods when the turbine was not operating, and erroneous data points caused by measurement system faults. The cleaned data used to characterize stack exit conditions is shown in **Figure C-1** through **Figure C-5** for the GLC bypass/WHRUs and **Figure C-6** through **Figure C-10** for the PG turbines. These figures show that the bypass/WHRU operation for each unit within the two turbine groups is similar enough to the other units in the group that it is reasonable to characterize all WHRU/bypass stacks within a group using the same modeled exit conditions.

Based on this assumption and recognizing that the data for a particular parameter approximates a normal distribution, the 90th and 10th percentile values for each operating parameter from each group of turbines was used to establish reasonable bounds on typical operation. The 90th and 10th percentile values are included on **Figure C-1** through **Figure C-10** and shown in **Table C-1** and **Table C-2** for the GLC group and **Table C-3** and **Table C-4** for the PG group.

Rather than attempt to establish which sets of paired-in-time stack exit velocity and temperature resulted in the highest model-predicted impacts from a particular stack, these modeled stack parameters were based on the lowest temperature (10th percentile) paired with the lowest exit velocity (10th percentile) even though those exit conditions will not occur at the same time. This was also done for the bypass stack independent of the WHRU stack even though exit parameters for these stacks are interdependent. This process should ensure modeling with stack parameters that will produce the highest impacts across all operating conditions without the need to model a wide range of actual paired-in-time stack exit conditions.

With the exit temperature and velocity established, turbine potential emissions were apportioned between the WHRU and bypass stacks assuming the stack with the worst dispersion characteristics would emit the most emissions based solely on the typical range of damper settings. For example, if the WHRU had the worst dispersion characteristics (i.e., lowest modeled temperature and velocity), the emissions were apportioned between the bypass and WHRU stacks based on a damper position setting favoring flow to the WHRU. It is important to note that modeled exit temperature and velocity were only used to identify the stack with the worst-case dispersion characteristics. Once that stack was determined, the damper position was selected independent (i.e., not paired in time) of the operating condition resulting in the stack temperature and velocity. This approach decouples the emissions assigned to each stack from the temperature and velocity to ensure the modeled stack parameters selected will produce the highest impacts across all operating conditions without the need to model a wide range of actual paired-in-time stack exit conditions. It is important to reiterate that while actual operating data was used to establish exit temperature and velocity, emissions were based on maximum potential operation.

As with the exit temperature and velocity, the damper position data approximates a normal distribution and the 90th and 10th percentile damper position from each group of turbines was used to establish reasonable bounds on typical operation and apportion the turbine emissions. The 90th and 10th percentile are included on **Figure C-5** and **Figure C-10** and shown in **Table C-1** through **Table C-4** for the GLCs and PG turbine/WHRU groups.

Results

The stack exit conditions that were used to simulate the WHRU/bypass stack pair for each group of WHRUs is provided in **Table C-1** and **Table C-2** for the GLCs and **Table C-3** and **Table C-4** for the PGs.

This methodology used to obtain the modeled stack parameters relied on the following simplifications that should provide reasonable assurance that stack parameters selected will produce the highest impacts while avoiding a refined modeling analysis of a range of operating conditions for each group of WHRUs:

1) Modeled parameters are based on actual temperature and velocity distributions. Temperature and velocity corresponding to full load operating conditions and potential emissions would be higher because the turbines rarely operate at full load.

2) Exhaust parameters were not paired in time. Modeled operating conditions represent a combination of low exit temperature and low velocity minimizing dispersion which could not occur under either actual or potential operation.

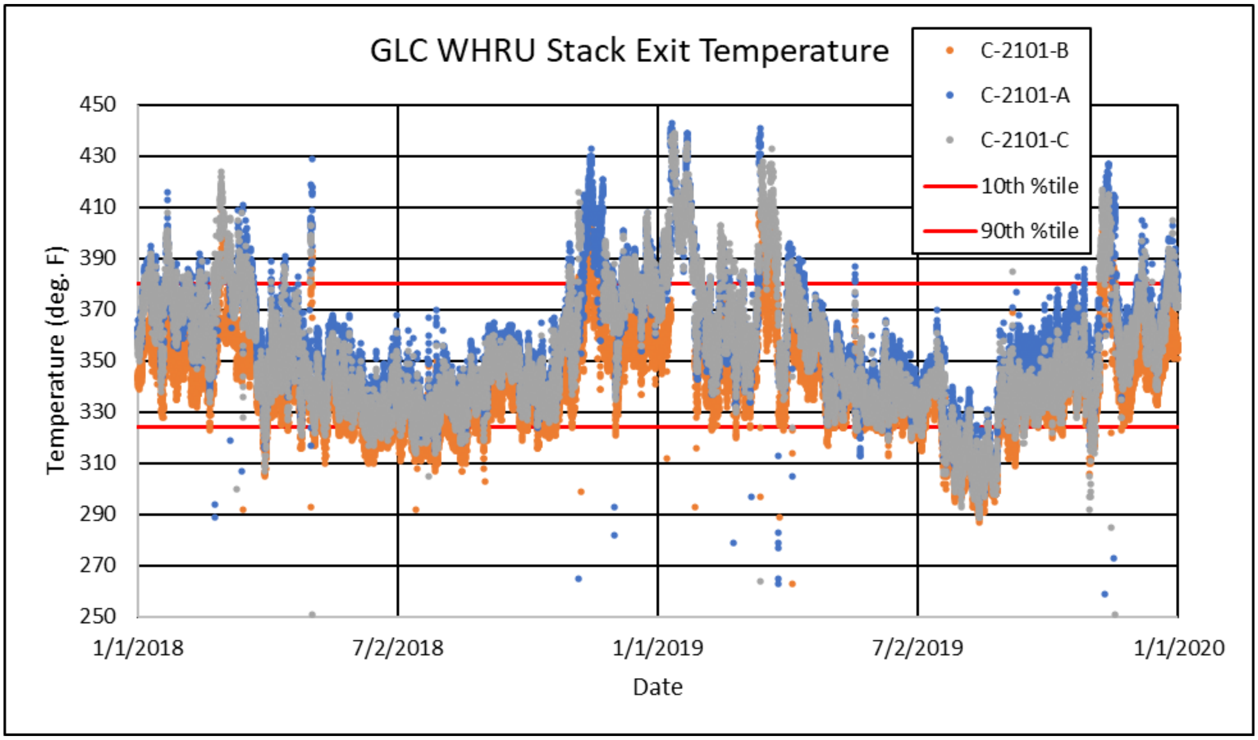

Figure C-1 GLC WHRU Stack Measured Temperature

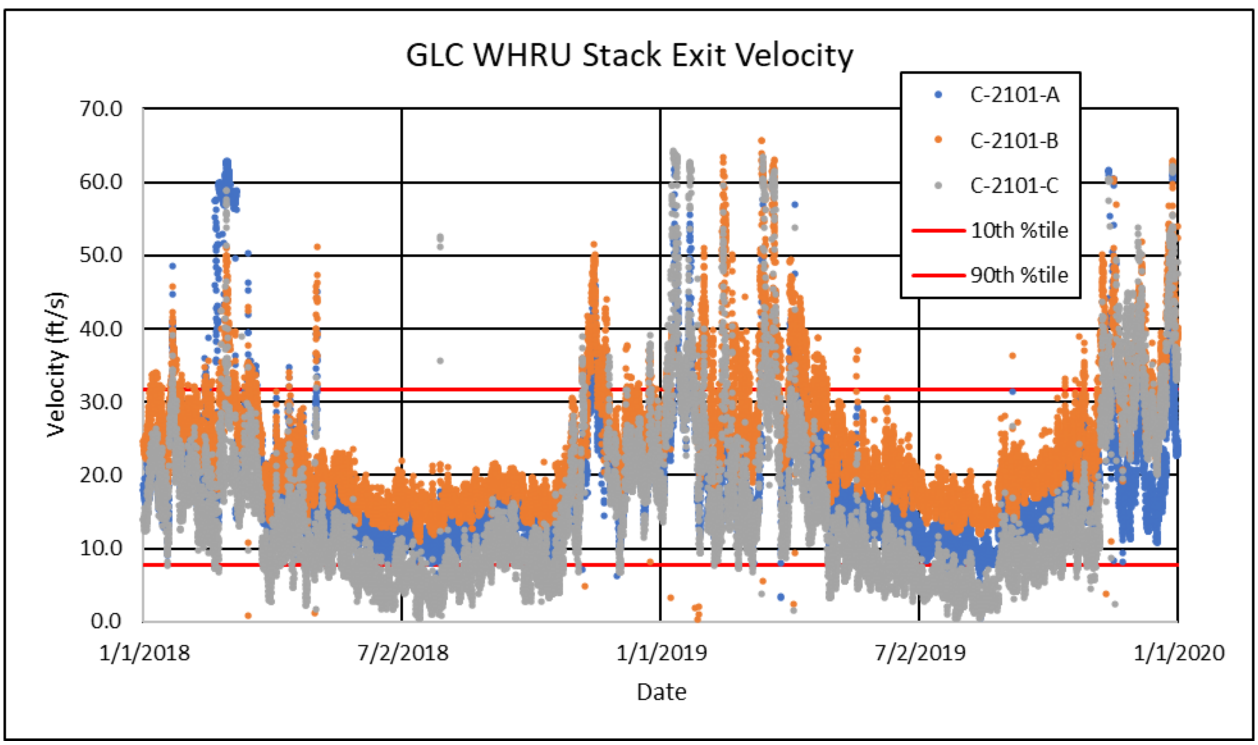

Figure C-2 GLC WHRU Stack Calculated Velocity

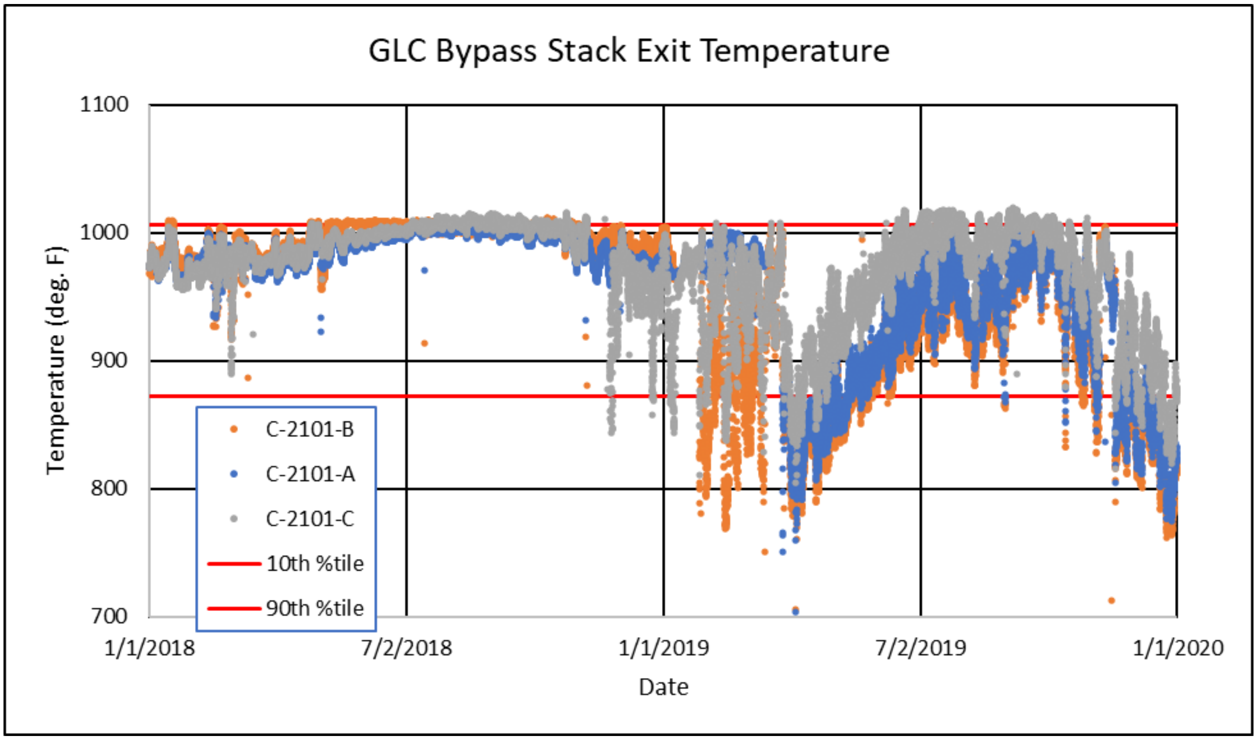

Figure C-3 GLC Bypass Stack Measured Temperature

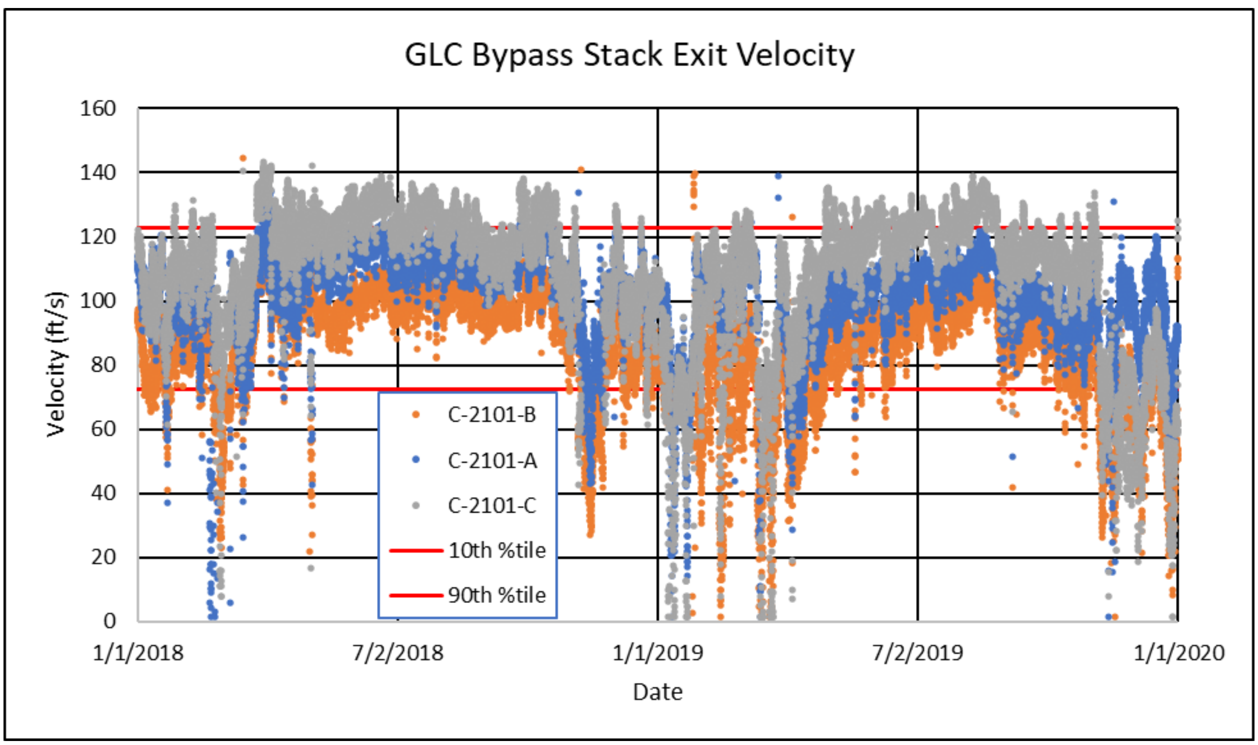

Figure C-4 GLC Bypass Stack Calculated Velocity

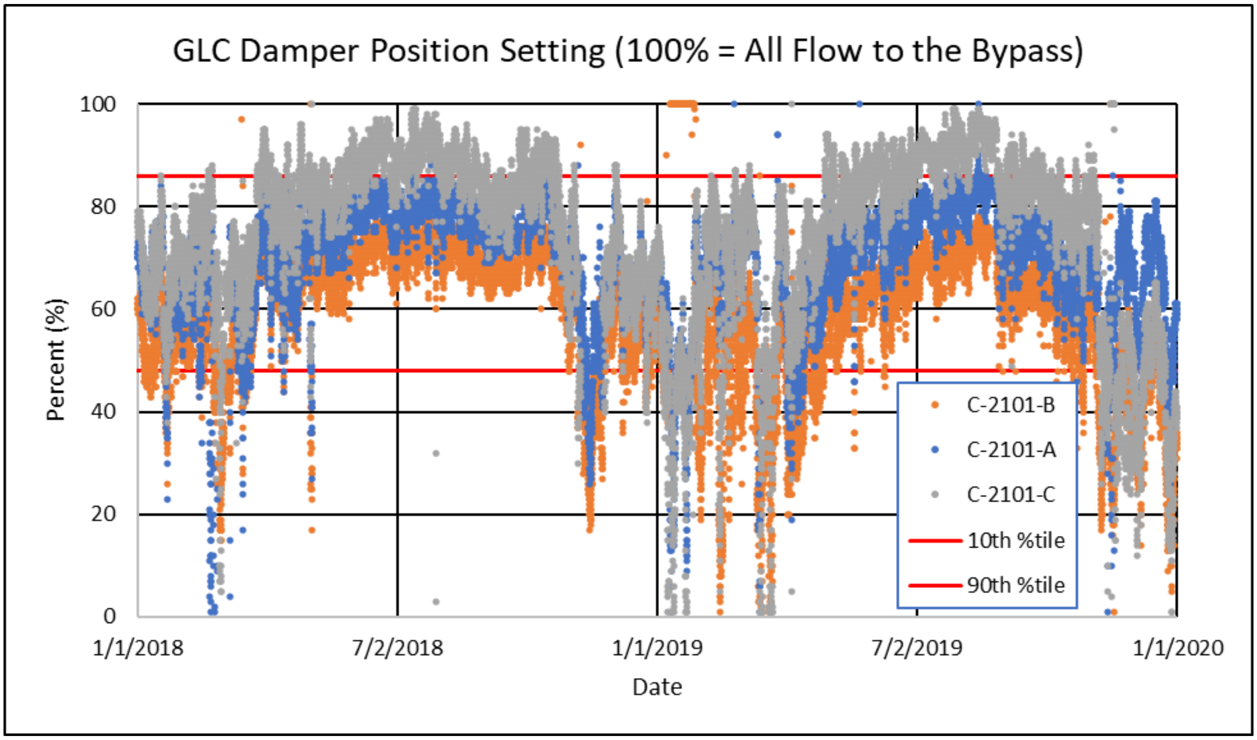

Figure C-5 GLC WHRU/Bypass Stack Damper Position

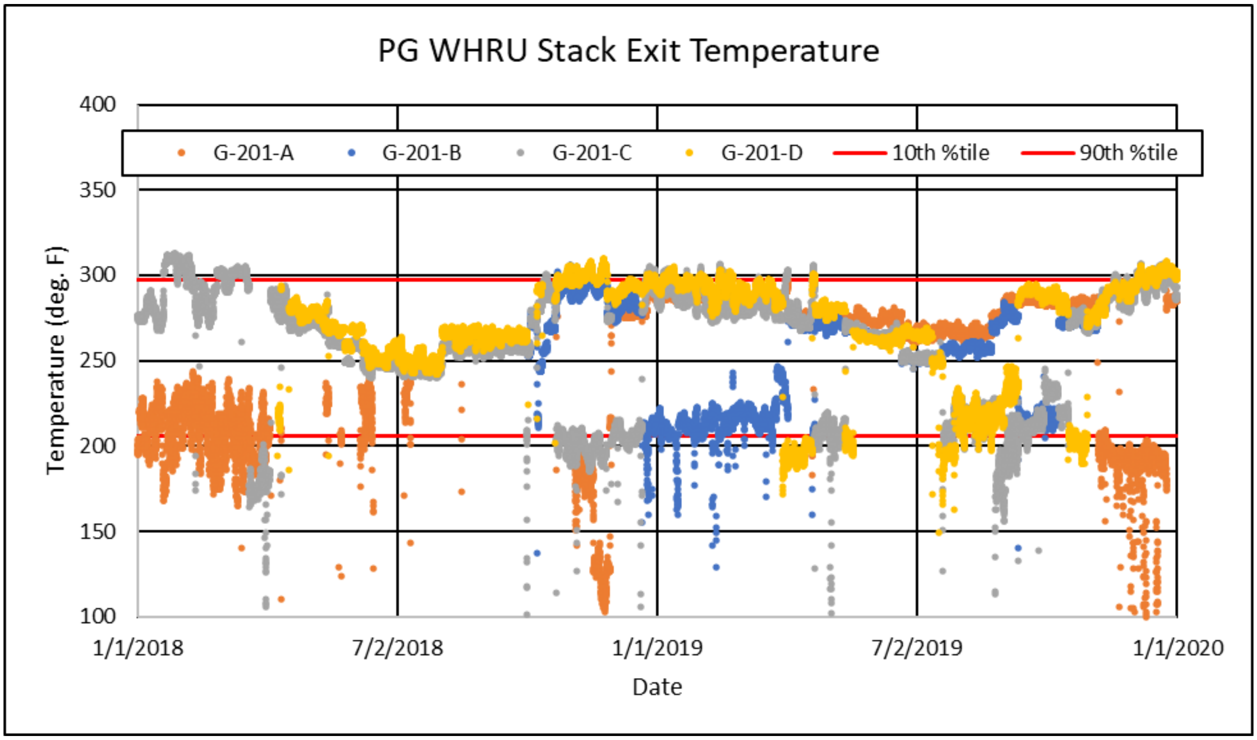

Figure C-6 PG WHRU Stack Measured Temperature

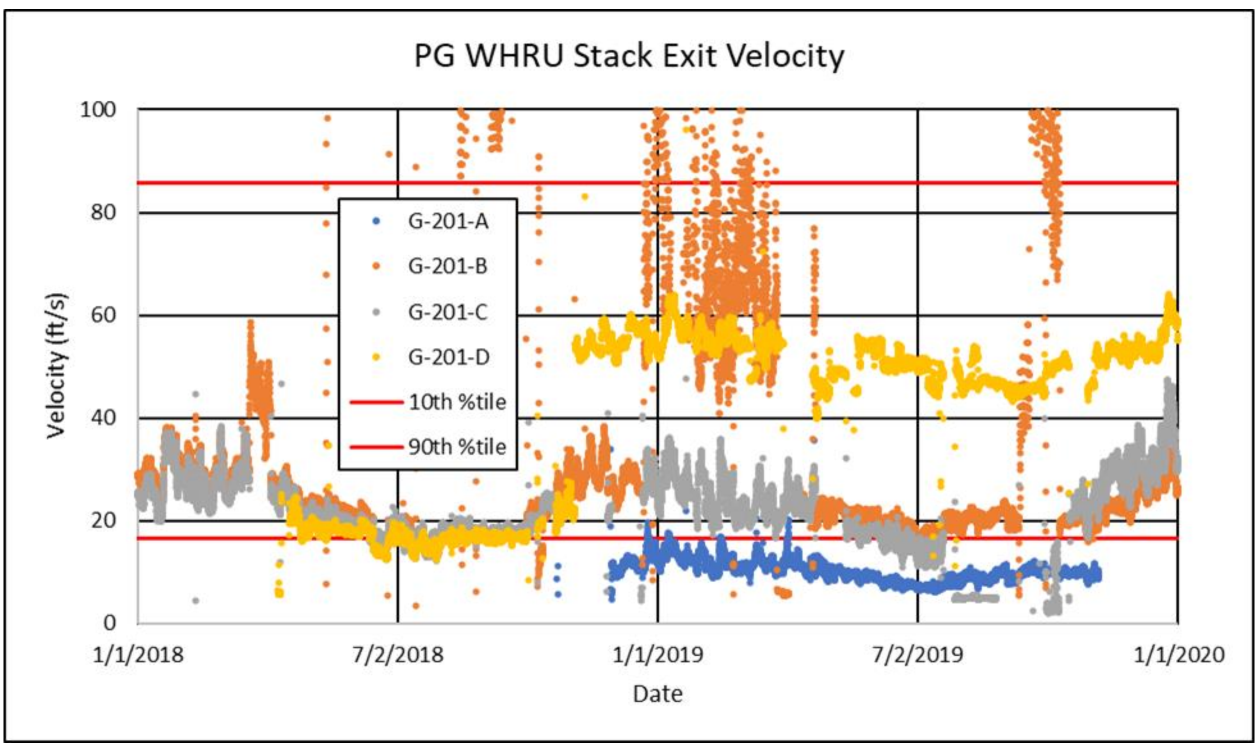

Figure C-7 PG WHRU Stack Calculated Velocity

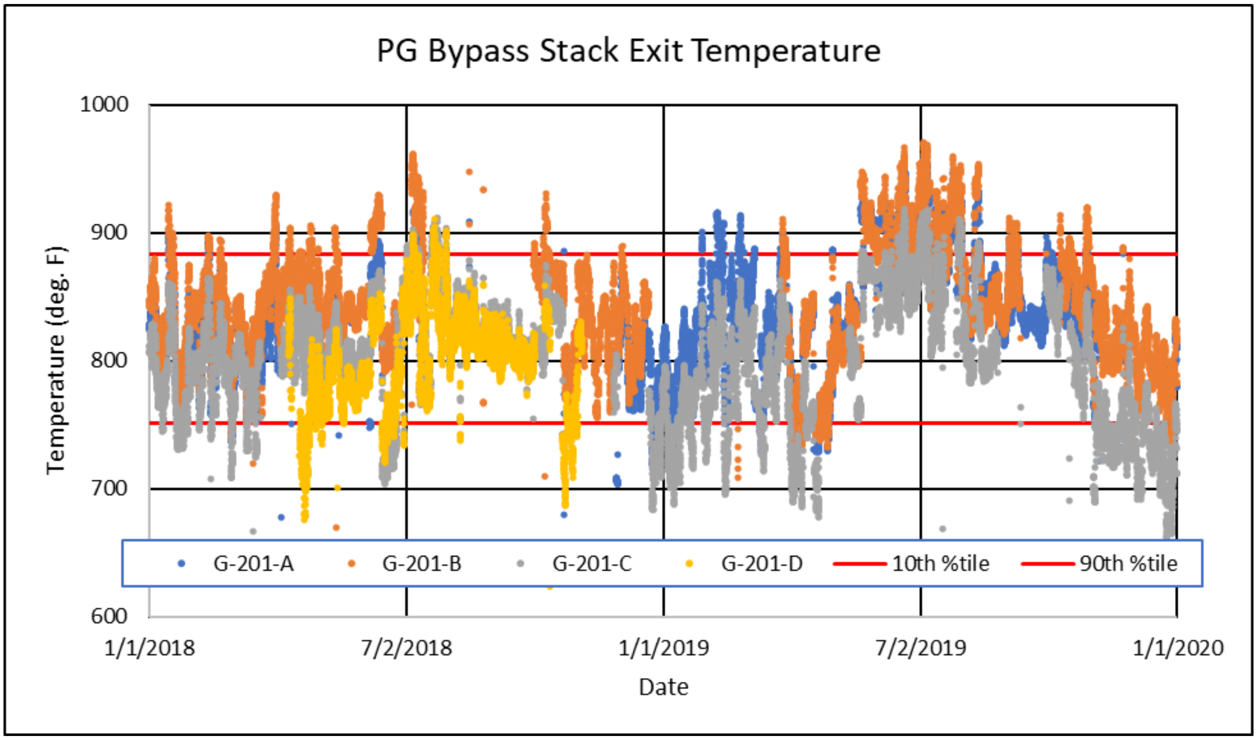

Figure C-8 PG Bypass Stack Measured Temperature

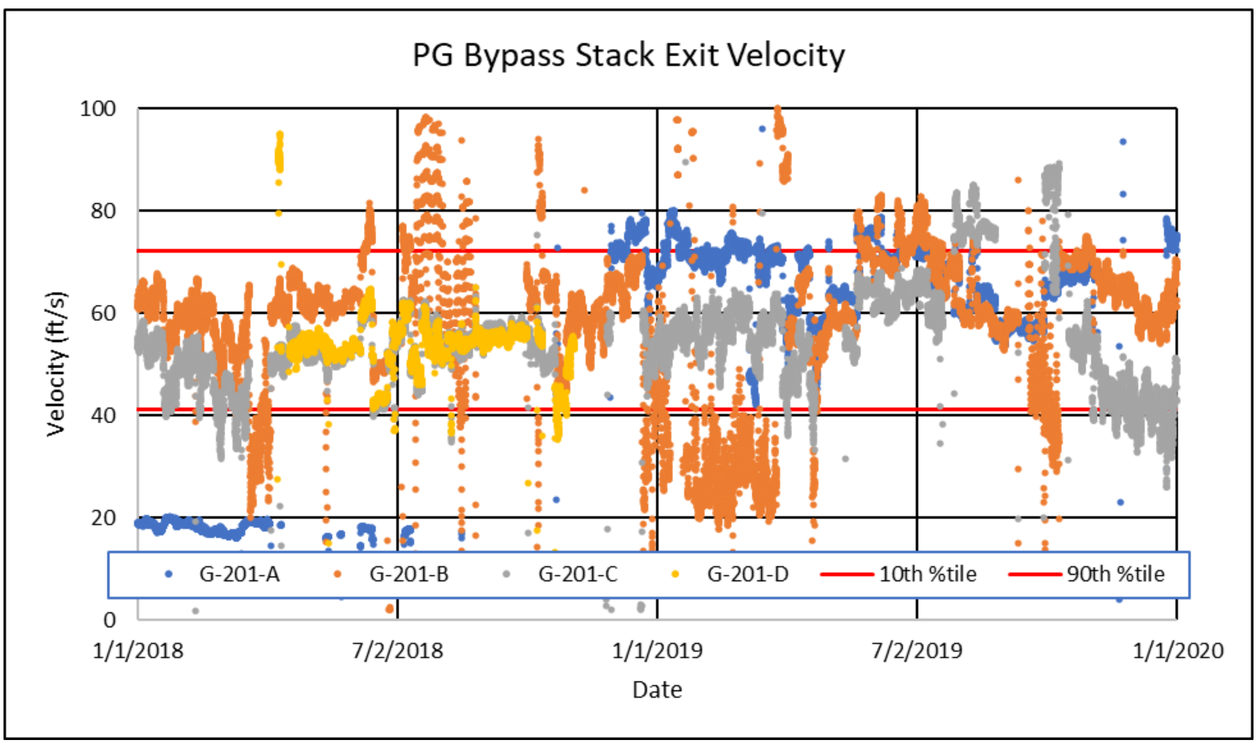

Figure C-9 PG Bypass Stack Calculated Velocity

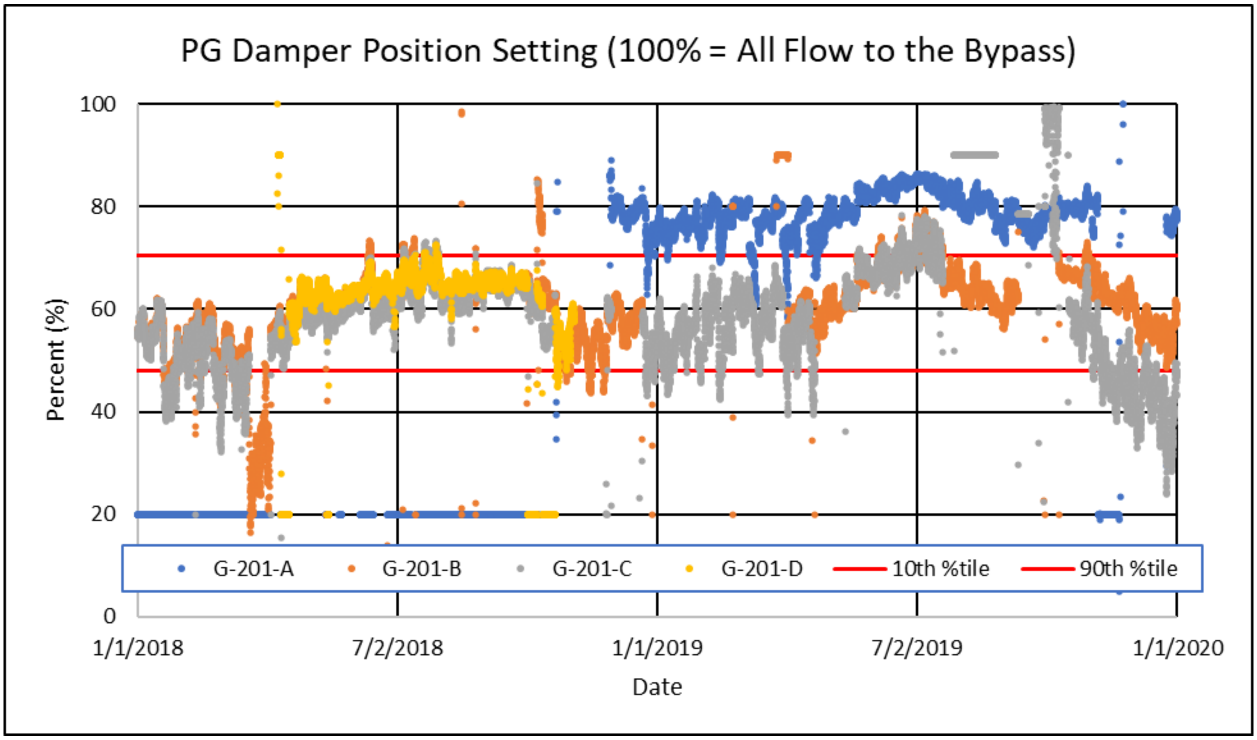

Figure C-10 PG WHRU/Bypass Stack Damper Position

Table C-1 GLC Bypass Stack Exit Characteristics Summary

Parameter	% of Total Turbine Exhaust Flow	English Units		SI Units	
		Stack Temperature (°F)	Stack Velocity (ft/s)	Stack Temperature (°K)	Stack Velocity (m/s)
90^{th} %tile	85%	1006	123	814	37
10^{th} %tile	48%	872	72	**740**	**22**
Modeled Value [(a)]	**45%**	-	-	**740**	**20**

a Rounded down to the nearest whole number based on 2 significant digits for temperature; and the nearest multiple of 5 for velocity. % Flow is rounded to the nearest multiple of 5 based on 2 significant digits.

Table C-2 GLC WHRU Stack Exit Characteristics Summary

Parameter	% of Total Turbine Exhaust Flow	English Units		SI Units	
		Stack Temperature (°F)	Stack Velocity (ft/s)	Stack Temperature (°K)	Stack Velocity (m/s)
90^{th} %tile	53%	380	32	466	10
10^{th} %tile	14%	323	8	**435**	**2**
Modeled Value [(a)]	**55%**	-	-	**430**	**2**

a Rounded down to the nearest whole number based on 2 significant digits for temperature; and the nearest multiple of 5 for velocity. % Flow is rounded to the nearest multiple of 5 based on 2 significant digits.

Table C-3 PG Bypass Stack Exit Characteristics Summary

Parameter	% of Total Turbine Exhaust Flow	English Units		SI Units	
		Stack Temperature (°F)	Stack Velocity (ft/s)	Stack Temperature (°K)	Stack Velocity (m/s)
90th %tile	71%	883	72	746	22
10th %tile	**48%**	751	41	**672**	**13**
Modeled Value [(a)]	**50%**	-	-	**670**	**15**

a Rounded to the nearest whole number based on 2 significant digits for temperature; and the nearest multiple of 5 for velocity. % Flow is rounded to the nearest multiple of 5 based on 2 significant digits.

Table C-4 PG WHRU Stack Exit Characteristics Summary

Parameter	% of Total Turbine Exhaust Flow	English Units		SI Units	
		Stack Temperature (°F)	Stack Velocity (ft/s)	Stack Temperature (°K)	Stack Velocity (m/s)
90th %tile	**52%**	297	31	420	26
10th %tile	30%	206	16	**370**	**5**
Modeled Value [(a)]	**50%**	-	-	**370**	**5**

a Rounded down to the nearest whole number based on 2 significant digits for temperature; and the nearest multiple of 5 for velocity. % Flow is rounded to the nearest multiple of 5 based on 2 significant digits.

Attachment F

Copy of:

Construction Permit No. 9773-AC016 Revision 1 (AQ0267CPT04)

Construction Permit No. AQ0267CP01

Minor Permit No. AQ0267MSS06

CPF-1

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF AIR AND WATER QUALITY
AIR PERMITS PROGRAM

410 Willoughby, Suite 303
Juneau, AK 99801-1795
PHONE: (907) 465-5100
FAX: (907) 465-5129
TTY: (907) 465-5010
http://www.state.ak.us/dec/

☑ Compliance Notebook
☐ TS Folder
☐ Permits Notebook

June 27, 2001

Copy: AB Reader
HSET Reader at ATO-1978
Slope Env. @ NSK61
File 9.1.7 @ NSK61
OPTIX @ ATO-1905

Alice Bullington
Phillips Alaska Inc.
P.O. Box 100360
Anchorage Alaska 99510-0360 Potreet

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
NO: 7000-0520-0025-2109-3316

Subject: Phillips Kuparuk Central Processing Facility No. 1 final decision for the administrative revision to PSD Construction Permit No. 9773-AC016.

Dear Alice Bullington:

Under the authority of AS 46.14.285, the Department is taking action to make the administrative revision to PSD Construction Permit No. 9773-AC016 to alter identification of equipment that has been replaced with equivalent equipment. Phillps proposes to install and operate the Industrial Commercial Equipment (ICE) 3.5 MMBtu/hr dual fired heater, tag No. H-102A, at the Circus Tent of the Kuparuk Operations Center and remove from service the diesel fired Tioga 4.5 MMBtu/hr heater, tag No. KS3680, that currently heats the tent. In addition, the Department is changing the permit to document change in operational control from ARCO Alaska Inc., to Phillips Alaska Inc.,

Enclosed is the revised PSD Construction Permit No. 9773-AC016 which contains the requirements of AS 46.14 and 18 AAC 50 applicable to the replacement of the Tioga heater with the ICE heater.

The terms and conditions of this revised construction permit remain effective until modified or revoked by the Department, regardless of any change in ownership of the facility or its sources. The responsibilities imposed by this construction permit may not be transferred without the written consent of the Department.

Please note that Alaska's air quality statutes, regulations, and permit application information can be obtained from the Department's Web Page at the following address: http://www.state.ak.us/dec/dawq/aqi/decaqi.htm.

Department regulations provide that if you disagree with this decision, you may request an adjudicatory hearing in accordance with 18 AAC 15.200-910. The request should be mailed to the Commissioner, Alaska Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, AK 99801-1795, by Certified Mail, Return Receipt Requested. If a hearing is requested, one copy of the request should be sent to the undersigned. Failure to submit a request within thirty days of service of this letter shall constitute a waiver of your right to an administrative review of this permit action by the Department.

RECEIVED
JUL 19 2001

In addition, any other person who has a private, substantive, legally-protected interest under state law that may be affected by the permit action, or a person who participated in the public process, may request an adjudicatory hearing within thirty days of service of the action. If a hearing is granted, it will be limited to the issues related to this permit action. You are reminded that, even if a request for an adjudicatory hearing has been granted, all permit terms and conditions remain in full force and effect.

Sincerely,

John F. Kuterbach, Manager
Air Permits Program

JFK/JB/JK/ G:\AWQ\Awq-Permits\AIRFACS\ARCO Kuparuk CPF-1\Construction\X16\amendment\permit revision cvrltr.doc

Enclosure: Revised Air Quality Construction Permit 9773-AC016

cc: Robert Cannone, ADEC/APP, Fairbanks
Bill MacClarence, ADEC/APP, Anchorage
Laurie Kral, U.S. EPA, Region 10, MS OAQ-108, Seattle
Kaye Laughlin , DGC/OMB, JPO Anchorage
Glenn Gray, DGC/OMB Juneau

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONSTRUCTION PERMIT

Permit No. 9773-AC016-Revision 1 Date: June 27, 2001
Originally issued February 13, 1998

The Department of Environmental Conservation, under the authority of AS 46.03, AS 46.14, 6 AAC 50, 18 AAC 15, and 18 AAC 50, issues this Air Quality Control Construction Permit to:

Owners: **Phillips Alaska, Inc., BP Exploration (Alaska), Inc., Chevron U.S.A., Inc., Exxon Company U.S.A., Mobile Oil Corporation, Union Oil Company of California**

Operator: **Phillips Alaska, Inc.**
P.O. Box 100360
Anchorage, AK 99510-0360

Permittee: **Phillips Alaska, Inc.**
Facility: **Kuparuk River Unit (KRU), Central Production Facility-1 (CPF-1)**

UTM Coordinates: Northing 7803.9 km, Easting 402.0 km, Zone 6
Township/Range: Section 9, T11N, R10E, Umiat Meridian

This permit authorizes the Permittee to install a GE Frame 6 gas-fired combustion turbine and an 8 MMBtu/hr gas-fired heater in accordance with the terms and conditions of this permit, and as described in the original permit application and subsequent submittals listed in Exhibit C. This permit lists a 4.2 MMBtu/hr heater installed in 1993, but not listed in permit 9373-AA004. The 4.2 MMBtu/hr heater is scheduled for replacement in the month of June 2001 by a 3.5 MMBtu/hr dual fired unit. This permit also authorizes the Permittee to operate the sources referenced above as provided by AS 46.14.120.

John F. Kuterbach 6/27/01

John F. Kuterbach, Manager Date
Air Permits Program

G:\AWQ\AWQ-PERMITS\AIRFACS\ARCO KUPARUK CPF-1\CONSTRUCTION\X16\REVISION 1.DOC

PERMIT TERMS AND CONDITIONS

I. Permit Continuity

Except as revised or rescinded herein, or as superseded by an Air Quality Operating Permit issued under AS 46.14.170, the Permittee shall comply with terms and conditions of Air Quality Control Permit to Operate No. 9373-AA004, as amended through January 4, 1997. If permit terms and conditions listed in this permit conflict with those of Permit No. 9373-AA004, then the Permittee shall comply with terms and conditions listed herein.

II. Standard Permit Conditions

A. The Permittee shall comply with each permit term and condition; noncompliance constitutes a violation of AS 46.14, 18 AAC 50, and the Clean Air Act, and is grounds for:

1. An enforcement action;

2. Permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280; or

3. Denial of an operating permits application.

B. It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.

C. Each permit term or condition is independent of the permit as a whole, and remains valid regardless of a challenge to any other part of the permit;

D. Compliance with the permit terms and conditions is considered to be compliance with those requirements that are:

1. Included and specifically identified in the permit; or

2. Determined in writing in the permit to be inapplicable.

E. The permit may be modified, reopened, revoked and reissued, or terminated for cause; a request by the permittee for modification, revocation and reissuance, or termination of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

F. The permit does not convey any property rights of any sort, nor any exclusive privilege.

G. The Permittee shall allow an officer or employee of the Department, or an inspector authorized by the Department, upon presentation of credentials and at reasonable times, with the consent of the owner or operator, to:

1. enter upon the premises where a source subject to the construction permit is located or where records required by the permit are kept;

2. have access to and copy any records required by the permit;

3. inspect any facilities, equipment, practices, or operations regulated by or referenced in the permit; and

4. sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

H. The Permittee shall furnish to the Department, within a reasonable time, any information the Department requests in writing to determine whether cause exists to modify, revoke and reissue, or terminate the permit, or to determine compliance with the permit; upon request, the Permittee shall furnish to the Department copies of records required to be kept; the Department, in its discretion, will require the Permittee to furnish copies of those records directly to the federal administrator.

III. Standard Record Keeping, Reporting, and Testing Conditions

A. The Permittee shall certify all reports, compliance certifications, or other documents submitted to the Department under this permit as required by 18 AAC 50.205.

B. The Permittee shall submit test plans, reports, certifications, and notices required under Air Quality Control Permit No. 9373-AA004 and this permit to the Department's Air Quality Maintenance Section, Compliance Assurance Group, 410 Willoughby Avenue, Suite 105, Juneau, AK 99801-1795; telephone (907) 465-5022, facsimile (907) 465-5129.

C. The Permittee shall keep records of required monitoring data and support information for at least five years after the date of the collection; support information includes calibration and maintenance records, original strip-chart recordings for continuous monitoring instrumentation, and copies of reports required by this permit. The Permittee shall keep monitoring and compliance records as required by the Clean Air Act and applicable federal air quality regulations.

D. The Permittee shall conduct source testing as requested by the Department, required by this permit and 18 AAC 50.220. The Permittee shall comply with all applicable federal Air Quality requirements, and shall:

1. use the applicable test methods set out in 40 CFR Part 60, Appendix A, and 40 CFR Part 61, Appendix B, to ascertain compliance with applicable standards and permit requirements;

a. The Permittee shall conduct source tests of unit exhausts and report the results as described. The Permittee may propose alternative test methods if it can be shown to be of equivalent accuracy, and will ensure compliance with the applicable standards or limits. Alternative test procedures must be approved by the Department prior to the test date.

(1) Nitrogen Oxides, NOx, expresses as NO_2 (ppm, lb/MMBtu, and lbs/hr): Reference Method 7E or Method 20 specified in 40 CFR, Part 60, Appendix A.

(2) Oxygen, O_2 (percent): Reference Method 3 or 3A as specified in 40 CFR, Part 60, Appendix A.

(3) Stack Velocity and Volumetric Flow Rate: Reference Methods 1-4 as specified in 40 CFR, Part 60, Appendix A.
(4) Particulate Matter (grains/dscf, lb/MMBtu, and lb/hr): Reference Method 5 as specified in 40 CFR, Part 60, Appendix A.
(5) Sulfur dioxide (SO_2) (ppm, lb/MMBtu, and lbs/hr) Reference Method 6 or 6C as specified in 40 CFR, Part 60, Appendix A.
(6) Visible Emission Surveillance (Percent): Reference Method 9 as specified in 40 CFR, Part 60, Appendix A.

2. submit to the Department, within 60 days after receiving a request and at least 30 days before the scheduled date of the tests, a complete plan for conducting the source tests;

3. give the Department written notice of the test dates 10 days before each series; and

4. within 45 days after completion of the set of tests, submit the results, to the extent practical, in the format set out in Source Test Report Outline in Volume III, Section IV.3, of the State Air Quality Control Plan, adopted by reference in 18 AAC 50.030(8).

E. The Permittee shall: install; calibrate; conduct applicable continuous monitoring system performance tests listed in 40 CFR 60, Appendix B, and certify test results; operate; and maintain air contaminant emissions and process monitoring equipment on the sources as described herein and in documents provided by the Permittee, listed in Exhibit C. The applicant shall submit monitoring equipment siting, operation, and maintenance plans and procedures for approval by the Department.

For continuous emission monitoring systems, the Permittee shall comply with each applicable monitoring system requirement, as listed in 40 CFR 60.13, 60.19, the applicable subpart as incorporated by reference in Condition VI, 40 CFR 60, Appendix F, and the EPA Quality Assurance Handbook For Air Pollution Measurements, EPA/600 R-94/038b. The Permittee shall attach to the Facility Operating Report required by Condition III.G, a copy of each continuous emission monitoring system data assessment report for Quality Assurance Procedures conducted in accordance with 40 CFR 60, Appendix F.

F. The Permittee may seek Department approval of alternate monitoring, record keeping, and reporting requirements than those listed in this permit by submitting a written request to the Department. Until such time as the Department approves an alternative monitoring, record keeping, or reporting requirement, the Permittee shall comply with the requirements listed in this permit.

G. Permittee shall submit to the Department two copies of a quarterly Facility Operating Report, as set out in Air Quality Control Permit No. 9373-AA004, Condition 15, and Exhibit A of this permit by January 30th, April 30th, July 30th, and October 30th each year for operations during the preceding calendar quarter.

H. Permittee shall report all excess emissions, meaning those emissions that exceed permit conditions or State and federal emission standards, to the Department as follows:

1. Upon discovery of any excess emission in quantity or duration that are potentially injurious to human health, immediately notify the Department's Spill Prevention and Response (SPAR) Division. Additionally, the Permittee shall send by facsimile a completed and signed "Excess Emission Notification Form," found in Exhibit D, to the Department within 24 hours of the discovery of the excess emission.

SPAR can be reached at the following numbers:

Central Alaska	269-7500	FAX 269-7648
Northern Alaska	451-2121	FAX 451-2362
Southeast Alaska	465-5340	FAX 465-2237

2. For excess emissions that do not fall in the above category, send by facsimile a completed and signed "Excess Emission Notification Form," found in Exhibit D, to the Department at (907) 465-5129, within 24 hours of discovery of the excess emission.

I. The Permittee shall operate each source in compliance with the applicable emission standards specified by 18 AAC 50.040-.070, by an applicable federal New Source Performance Standard (NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP), by limits established as the result of a BACT or LAER determination, or the owner-requested emission limits, standards, fuel specifications, and operating limits.

IV. Notification and Operating Conditions

A. The Permittee is authorized to install and operate the following new emission sources at the Kuparuk CPF-1 Facility:

Tag #	Description	Rated Capacity
G-3203	GE Frame 6 --PG6551(B) Gas Turbine	38,932 kW @ ISO Condition
H-3204	Kvaerner Process Systems Fuel-Gas Heater	8 MM Btu/hr heat input

The Permittee is authorized to operate the following existing emission source at the Kuparuk CPF-1 Facility:

Tag #	Description	Rated Capacity
H-102A	Industrial Commercial Equipment dual-fired 1. Air Heater	3.5 MM Btu/hr heat input

B. The Permittee shall develop and implement standard operating and maintenance procedures for each source listed in Condition IV.A of this permit. Permittee shall keep a copy of the procedures available at a location within the facility that is readily accessible to operators of the equipment and to authorized representatives of the Department.

The Permittee shall install, maintain, and operate, in accordance with standard operating procedures, fuel-burning equipment, process equipment, emission control devices, and testing equipment and monitoring equipment to provide an optimum control of air contaminant emissions during all operating periods.

C. The Permittee shall keep a copy of this permit, the State Air Quality Control Regulations 18 AAC 50, and Alaska Statutes 46.14, on file at the facility.

D. The Permittee shall document the date construction commences, stops, and when construction is completed for each new emission source listed in Condition IV(A). If subject to 18 AAC 50.320(c)(1) or (2), the Permittee shall notify the Department and submit a new Best Available Control Technology assessment for review before commencing or continuing construction.

E. For each source listed in Condition IV(A), the Permittee shall monitor and record the hours of operation. The Permittee shall report the hours each source operates each month in the Facility Operating Report required by Condition III(G).

V. 18 AAC 50.010: Ambient Air Quality Standards and Increments

A. The Permittee shall not interfere with the attainment or maintenance of the Ambient Air Quality Standards listed in 18 AAC 50.010, and shall not cause or contribute to a violation of the maximum allowable ambient concentrations (the PSD increments) listed in 18 AAC 50.020 as follows:

1. Except as provided for in Condition V(A)(2), construct and operate the facility in accordance with the application and subsequent submittals listed in Exhibit C of this permit.

2. Notify the Department prior to making any change at the facility that deviates from the permit application and subsequent submittals listed in Exhibit C, such as changes in equipment size, configuration, or location.

   a. The Permittee shall ask the Department if additional ambient impact assessment modeling is warranted for the proposed change.

   b. Within 60 days upon receiving written Department notice that modeling is warranted, the Permittee shall prepare and submit to the Department an ambient impact assessment for the specified air contaminant and averaging period.

   c. The Permittee shall not make the change until the Department concurs the change will not interfere with attainment or maintenance of ambient standards and increments.

should not

3. Limits on fuel type and quality. The Permittee shall operate the new emission sources G-3203 and H-3204 using only natural gas fuel with a hydrogen sulfide (H_2S) content not exceed 200 ppm, 24-hour average. The Permittee shall operate Source No. H-102A using gas or distillate fuel oil with a fuel sulfur content not to exceed 0.5%. (?

B. Monitoring and recording: The Permittee shall conduct periodic fuel sulfur tests or obtain vendor certification of fuel sulfur content in accordance with Condition VII(C);

C. Reporting: The Permittee shall report fuel sulfur test results or copies of vendor certification of fuel sulfur content in accordance with Condition VII(C);

VI. 18 AAC 50.040: Federal Standards Adopted by Reference

The Permittee shall comply with the requirements of 40 CFR 60, New Source Performance Standards (NSPS), and 40 CFR 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), as they apply to the equipment specified below.

The Permittee shall submit a copy of all NSPS and NESHAPS reporting to the U.S. EPA Region 10 and the Department, as required by the applicable Federal standards. The Permittee may attach periodic federal reporting to the Facility Operating Report required by Condition III(G).

The Permittee shall notify the Department of any U.S. Environmental Protection Agency (EPA) granted waivers of NSPS or NESHAP emission standards, record keeping, monitoring, performance testing, or reporting requirements within 30 days after the Permittee receives a waiver.

A. 40 CFR 60, Subpart A. In accordance with 40 CFR 60, Subpart A, 40 CFR 61, Subpart A, and 18 AAC 50.040, for each construction, modification, or reconstruction of affected facilities and sources regulated under 40 CFR 60 and 61, the Permittee shall notify the Department and EPA of anticipated beginning construction date, initial equipment start-up date, actual equipment start-up date, and performance test date, and submit all information required under 40 CFR 60.6-60.8, 60.11-13, 60.14-19, 40 CFR 61.07, and 61.09-61.14.

B. 40 CFR 60, Subpart GG; Gas-fired turbine unit G-3203

1. Applicability and designation of affected facilities, 40 CFR 60.330. Affected units are all stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour based on lower heating value as described in 40 CFR 60.330(a) and (b).

2. Standard for sulfur dioxide, 40 CFR 60.333. The Permittee shall comply with the sulfur dioxide new source performance limitation listed in 40 CFR 60.333(a) or (b) of 150 ppm or 0.8% sulfur content by weight. The permittee shall comply with these requirements by burning natural gas with a hydrogen sulfide content no greater than 200 ppm, 24-hour average.

3. Monitoring of operations, 40 CFR 60.334. The permittee shall comply with 40 CFR 60.334(b) to monitor the sulfur content of the fuel gas. The permittee shall record fuel gas sulfur content or develop a custom schedule to test fuel as specified in 40 CFR 60.334(b)(2). The permittee shall include with reports submitted under 40 CFR 60.7(c), information as listed in 40 CFR 60.334(c), (c)(2) and (c)(4).

4. Test methods and procedures, 40 CFR 60.335.

   a. The permittee shall conduct performance tests in accordance with Condition III.D as required in 40 CFR 60.335(b), or alternative test methods in accordance with 40 CFR 60.335(f).

   b. The permittee may propose an alternative to the reference methods in accordance with 40 CFR 60.335(f)(1).

'II. 18 AAC 50.055: Industrial Processes and Fuel-Burning Equipment

Sources G-3203, H-3204, and H-102A

A. The Permittee shall comply with 18 AAC 50.055(a)(1) and 18 AAC 50.055(b)(1), which state that visible emissions, excluding condensed water vapor, from an industrial process or fuel-burning equipment may not reduce visibility through the exhaust effluent by greater than 20 percent, for a total of more than three minutes in any one hour, and particulate matter emitted from an industrial process or fuel-burning equipment may not exceed, per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours, 0.05 grains.

B. The Permittee shall comply with 18 AAC 50.055, which states that sulfur compound emissions, expressed as sulfur dioxide, may not exceed 500 ppm averaged over a period of three hours. The Permittee shall ensure compliance with this requirement by using only natural gas fuel in units G-3203 and H-3204 with a hydrogen sulfide content not to exceed 200 ppm, 24-hour average, and by using gas or distillate fuel oil with a sulfur content not to exceed 0.50% for source H-102A.

C. Monitoring and recording: The Permittee shall:

1. Conduct a visible emission surveillance for sources G-3203, H-3204, and H-102A, no less than once each calendar year in accordance with Condition III(D).

2. Upon Department request, conduct a particulate matter emission test or visible emission surveillance as set out in permit Condition III(D);

3. Measure the hydrogen sulfide content of natural gas fuel in accordance with Permit Condition VI.B.4. Measure the fuel sulfur content of distillate fuel oil in accordance with sulfur measurement methods incorporated by reference under ASTM D 196 no less than once a month or attach a vendor certification documenting the fuel sulfur content of each delivery to the CPF-1 facility;

4. Measure the amount of fuel consumed in each source. The fuel use may be estimated by calculations approved by the Department. Fuel meters, if used, must be calibrated and certified to be accurate to ±5%; submit a copy of the manufacturer's certification of accuracy for each fuel meter within 90 days after meter installation.

D. Reporting--The Permittee shall:

obsolete requirement

Revise

1. Attach to the Facility Operating Report under Condition III(G), Visible Emission Reports for a surveillance conducted under VII(C)(1) or (2).

2. List in the Quarterly Facility Operating Report under Condition III(G):

   a. The daily average natural gas fuel hydrogen sulfide content measured in accordance with Condition VII(C)(3).

   b. For each source, the fuel use each month.

   c. The analytical results of distillate fuel oil sulfur content or vendor certification required by Condition VII(C)(3).

3. Submit a copy of the fuel meter(s) certification, if applicable.

VIII. 18 AAC 50.110: Air Pollution Prohibited

A urces

The Permittee shall comply with 18 AAC 50.110, which states that no person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property.

To comply with this requirement, the Permittee shall:

A. Within 10 days, submit a written report of any public complaint, including the date, time, and nature of complaint;

B. Take reasonable actions to address air pollution complaints resulting from emissions at the facility; and

C. Notify the Department no less than 30 days in advance of any planned modification or replacement of the fuel burning equipment, which might result in increased potential air contaminant emissions. The notification must be in writing and must include a description of the proposed change and an estimate of any change in the quantity of emissions of each regulated air contaminant that may occur as the result of the modification or replacement.

IX. 18 AAC 50.315 (e) (3) (A): Best Available Control Technology (BACT)

The Permittee shall install emission or operational controls as BACT for the following equipment:

A. Limits

1. Oxides of Nitrogen (NOx) control technology:

   a. The Permittee shall install and operate
      (1) Source G-3203 with CZ liner lean-head combustion technology or alternative technology capable of achieving continuous compliance with the limit specified in IX(A)(1)(b).
      (2) Source H-3204 with low NOx burners.

   b. The Permittee shall comply with the following NOx emission limits:
      (1) Emissions from Source G-3203 not to exceed 150 ppmvd corrected to 15% oxygen and ISO conditions, and not to exceed 266 lbs/hour.
      (2) Emissions from Source H-3204 not to exceed 0.10 lb/MMBtu.

2. Sulfur Dioxide (SO_2) control technology: The permittee shall operate sources G-3203 and H-3204 with natural gas fuel only. The Permittee shall use natural gas fuel with a hydrogen sulfide content not exceed 200 ppmv, 24-hour average.

B. Monitoring and Record Keeping

1. NOx--Permittee shall monitor and record compliance as follows:

   a. Permittee shall obtain from the manufacturer and submit to the Department NOx emission curves that reflect expected NOx emissions over the expected range of loads and operating temperatures;

   b. Permittee shall conduct two NOx emission source tests of Source G-3203 within one year of the commission date, in accordance with permit condition III(D). Permittee shall conduct one test during June through August, and the second test in January or February;

   c. if source test results of IX(B)(I)(b) are both below 80% of the NOx limit specified in Condition IX(A)(1), Permittee shall conduct an emission source test no less than once every five years;

   d. except as provided for in Condition IX(B)(1)(c), if source test results are both below 90%, Permittee shall conduct an emission source test no less than once every two years;

   e. except as provided for in Conditions IX(B)(1)(c) or (d)

   Permittee shall, within 90 days after conclusion of tests set out in IX(B)(1)(b), install, calibrate, certify, operate, and maintain in accordance with Condition III(e), a continuous oxides of nitrogen emission monitoring system (CEMS) on the exhaust stack of Source G-3203. Permittee shall continuously monitor and record compliance with Condition IX(A)(1)(b)(1) based upon 1-hour average oxides of nitrogen measurements.

2. SO_2--Refer to sulfur dioxide monitoring and record keeping, Conditions VI(B) and VII(C).

C. Reporting

1. NOx

   a. Before Source G-3203 is commissioned, the Permittee shall submit to the Department a copy of the contractor documentation that Source G-3203 has been fitted with the CZ Liner lean-head combustion technology.

   b. If subject to IX(B)(1)(e), the Permittee shall attach a copy of the CEMS quarterly cylinder gas audit and annual relative accuracy audit data reports to the facility operating report required under Condition III(G).

   c. If subject to IX(B)(1)(e), the Permittee shall attach to the facility operating report a table of daily average oxides of nitrogen emission from Source G-3203.

2. SO_2--Report as provided for under Condition VII(D).

EXHIBIT A
FACILITY OPERATING REPORT ATTACHMENTS

Unless transmitted under a separate cover to the Department, the Permittee shall attach or include reports as listed below in accordance with Condition III(B) and the Conditions cited below:

1. Condition III(E) and IX(C)(1)(e)--Continuous Emission Monitoring System Data assessment reports.

2. Condition IV(E)--List of Operational Hours for emission sources.

3. Condition VI--EPA periodic reporting for New Source Performance Standard Affected Facilities at Kuparuk CPF-1, or Industrial process and fuel burning equipment emission standards.

4. Condition VII(D)(1)--Visible Emission Surveillance Forms.

5. Condition VII(D)(2)--Fuel sulfur content reporting and consumption.

6. Condition IX(C)(1)(c)--Daily average NOx turbine emissions, if applicable.

Certify the Facility Operating Report in accordance with Condition III(A) and submit to the Department in accordance with Condition III(B).

EXHIBIT B
SUBMITTAL LIST

1. Certify and submit all notifications in accordance with Conditions III(A) and (B).

2. Submit reports and notices required under Conditions III(D)(2), (3), and (4), for source tests.

3. Submit monitoring notices and requests set out under Condition III(E) and (F).

4. Submit excess emission reports as set out in Condition III(H) and Exhibit D.

5. Submit BACT analyses if subject to Condition IV(D) and 18 AAC 50.320(c).

6. Submit facility changes as set out in Condition V(A)(2).

7. Submit NSPS/NESHAPS reports and certifications as set out in Condition VI(A) and VI(B)(4).

8. Submit the fuel meter certifications as set out in Conditions VII(C)(4) and VII(D)(3).

9. Submit public complaint reports as set out in Condition VIII(A).

10. Submit modification notices as set out in Condition VIII(C).

Submit Low NOx control technology certification in accordance with Condition IX(C)(1).

EXHIBIT C
PERMIT APPLICATION DOCUMENTATION

January 23, 1997	AAI comments regarding preliminary decision.
October 20, 1997	Technical Analysis Report (TAR) drafted by C. Hudson, A. Schuler, J. Baumgartner.
September 25, 1997	Letter from L. Pekich (ARCO), to B. Cannone (ADEC), notifying heater was not included in 1993 permit.
August 30, 1997	Letter from L. Pekich (ARCO), to J. Baumgartner (ADEC). Supplemental information requested not required/no associated impacts from drill rigs.
May 13, 1997	Cover letter from L. Pekich (ARCO), to J. Baumgartner (ADEC), to PSD application including Coastal Project Questionnaire (CPQ).
January 3, 1997	Air Quality Control Permit to Operate 9373-AA004 for Kuparuk River Unit CPF-1, amendment #1.
December 16, 1996	Facsimile from L. Pekich (ARCO), to P. Buck (ADEC), including the EPA-approved alternative monitoring schedule for other facility turbines.
December 12, 1996	Memo from P. Buck (ADEC), to J. Baumgartner (ADEC), including meeting minutes from pre-application meeting.
May 11, 1993	Air Quality Control Permit to Operate 9373-AA004 for Kuparuk River Unit CPF-1.

EXHIBIT D, EXCESS EMISSION REPORT
ARCO ALASKA, INC. • PRUDHOE BAY/GPMA/KUPARUK

FACILITY: ____________ **PERMIT NO.** ____________

GAS DISPOSITION

Date of Occurrence: ________ (mm/dd/yy)

Flare or Vent (Circle Selection)

0000		2400		Minutes
From: ______	To: ______		=	______
From: ______	To: ______		=	______
From: ______	To: ______		=	______
From: ______	To: ______		=	______
From: ______	To: ______		=	______
From: ______	To: ______		=	______

Total Volume Flared: ________ MSCF ________ BBLS

(Includes Volume Flared Which Generated Black Smoke, if applicable)

Meter No.: (By EOC)

Planned **Unplanned** (Circle Selection)

*Venting defined as a release to atmosphere. Flaring is gas leaving through flare tip.

Total Minutes Flared: = ________

(Lisburne Only - Gas flared was from upstream/downstream(Circle One) of TEG contactor meter at LPC.)

A. Description of Incident and Cause: (Check as Many as Needed to Fully Describe the Incident)

- ______ S/D T/C# ______ for ______ .
- ______ T/C SD due to high exhaust temperature.
- ______ Seal oil system difficulties.
- ______ EMERGENCY SHUTDOWN.
- ______ Electrical/Instrumentation malfunction.
- ______ Electrical/Instrumentation malfunction at other facility (T&D).
- ______ High tie line pressure.
- ______ Gas transit system overpressure backing CPF/Flow Station out.
- ______ Excessive/insufficient inlet gas rates into facility.
- ______ Process upset in ______ section of facility.
- ______ Flaring for drillsite shutdown/startup.
- ______ Flare system testing.
- ______ Faulty shutdown on ______ .
- ______ Facility maintenance.
- ______ High ambient temperatures.
- ______ S/D on high vibration.
- ______ Flare valves opened to relieve system overpressure.
- ______ Other: ______

B. Action Taken to Eliminate Cause and Prevent Recurrence: (Check & Describe as Applicable)

- ______ Started/restarted T/C # ______ .
- ______ Compressor/train depressured.
- ______ Reduced/increased inlet gas rates.
- ______ Completed flare testing.
- ______ Corrected E&I fluctuation/failure.
- ______ Corrected E&I fluctuation/failure at other facility (T&D).
- ______ Stabilized facility process and operation.
- ______ Repaired equipment difficulties with with ______ .
- ______ Facility maintenance completed.
- ______ Other: ______

Black Smoke Section

Did Incident Cause Black Smoke? Yes: ______ No: ______ (If Yes, continue with this section)

Did Incident present a potential threat to human health or safety? Yes: ______ No: ______

(If Yes, report to ADEC as soon as possible)

Black Smoke emitted from source: ______ (enter tag number and description)

Notified ADEC by Fax on: Date: ______ Time: ______

Report the following information to ADEC within 24 hours BY FAX (907-465-5129):

Date and Time of black smoke event: From: ______ To: ______

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR QUALITY CONSTRUCTION PERMIT

Permit No. 267CP01 Date: Final – April 28, 2003

ConocoPhillips Alaska, Inc.
Kuparuk Central Production Facility #1
Permit Revisions Pertaining to Emission Limits

The Department of Environmental Conservation, under the authority of AS 46.03, AS 46.14, AS 46.40, 6 AAC 50, 18 AAC 15, and 18 AAC 50.315, issues an Air Quality Construction Permit to:

Owner(s):

ConocoPhillips Alaska, Inc.
700 G Street
P.O. Box 100360
Anchorage, AK 99510-0360

Exxon Company, USA
800 Bell Street, Room 2917
P.O. Box 2180
Houston, TX 77252-2180

BP Exploration (Alaska) Inc
900 E. Benson Blvd.
P.O. Box 196612
Anchorage, AK 99519-6612

Union Oil Company of California
909 West 9th Ave
P.O. Box 190247
Anchorage, AK 99519-0247

Chevron Texaco
P.O. Box 36366
Houston, TX 77236

Mobil Oil Corporation
12450 Greenspoint Drive
Houston, TX 77060-1991

The Department authorizes the following revisions to:

1. Operating Permit No. 9373-AA004 Amendment #1 for
   - the rated capacity for some of the equipment listed in Exhibit A;
   - the removal of some equipment listed in Exhibit A that are no longer in operation;
   - the inclusion of the diesel-fired equipment and storage tanks missing in Exhibit A and provided in 8/30/02 permit application;
   - the short-term and annual emission limits for equipment listed in Exhibit B; and
   - minor deletions from the requirements of Exhibit C.

2. PSD Construction Permit No. 9773-AC016 Revision 1 for
   - the rated capacities of the equipment listed in Section IV.A.

In accordance with the terms and conditions of this permit, and as described in the original permit application. This permit also authorizes the Permittee to operate the proposed equipment as provided by AS 46.14.120.

John F. Kuterbach

John F. Kuterbach, Manager
Air Permits Program

4/28/03
Date

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PERMIT TERMS AND CONDITIONS

A. 18 AAC 50.340(i): Permit Continuity

1. This permit rescinds and replaces Air Quality Control Permit to Operate No. 9373-AA004 and Air Quality Control Construction Permit No. 9773-AC016 as amended through January 3, 1997 and June 27, 2001, respectively.

2. Except as provided herein, the requirements contained in Air Quality Control Permit to Operate No. 9373-AA004 and Air Quality Control Construction Permit No. 9773-AC016 as amended through January 3, 1997 and June 27, 2001, respectively, remain in effect until superseded by an Operating Permit issued under AS 46.14.170.

3. Exhibit A in this permit, Source Inventory, is a revision to Exhibit A of Air Quality Control Permit to Operate No. 9373-AA004 Amendment 1 and Section IV.A of Air Quality Control Construction Permit No. 9773-AC016 Revision 1.

4. Exhibit B in this permit, Air Contaminant Emission Limits, Standards, Fuel Specifications, and Operating Limits, is a revision to Exhibit B of AQC Permit to Operate No. 9373-AA004 Amendment 1 and Sections VII and IX of Air Quality Control Construction Permit No. 9773-AC016 Revision 1.

5. Exhibit C in this permit, Process Monitoring Requirements, is a revision to Exhibit C of Air Quality Control Permit to Operate No. 9373-AA004 (issued May 11, 1993).

B. Record Keeping, Reporting, and Testing Conditions

6. The Permittee shall keep records of required monitoring data and support information for at least five years after the date of the collection; support information includes calibration and maintenance records, original strip-chart recordings for continuous monitoring instrumentation, and copies of reports required by this permit. The Permittee shall keep monitoring and compliance records as required by the Clean Air Act and applicable federal air quality regulations.

C. 18 AAC 50.055: Industrial Processes and Fuel-Burning Equipment

7. The Permittee shall comply with 18 AAC 50.055(a)(1) for visible emissions, 18 AAC 50.055(b)(1) for particulate matter emissions, and 18 AAC 50.055(c) for sulfur compound emissions as follows:

   7.1 Visible emissions, excluding condensed water vapor, from an industrial process or fuel-burning equipment may not reduce visibility through the exhaust effluent by any of the following:

      a. more than 20% for more than three minutes in any one hour[1], or

      b. more than 20% averaged over any six consecutive minutes[2].

[1] For purposes of this permit, the "more than three minutes in any one hour" criterion in this condition will no longer be effective when the Air Quality Control (18 AAC 50) regulation package effective 5/3/02 is adopted by the U.S. EPA.

[2] The six-minute average standard is enforceable only by the state until 18 AAC 50.055(a)(1), dated May 3, 2002, is approved by EPA into the SIP at which time this standard becomes federally enforceable.

7.2 Particulate matter emitted from an industrial process or fuel-burning equipment may not exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

7.3 Sulfur-compound emissions, expressed as sulfur dioxide, from an industrial process or from fuel-burning equipment may not exceed 500 ppm averaged over a period of three hours.

EXHIBIT A
Source Inventory

The table below provides a list of sources included in the AQC Permit to Operate No. 9373-AA004 and Construction Permit No. 9773-AC016, and the revisions made as they are carried forward to this new Construction Permit No 267CP01. The design rating and capacity as set out in this exhibit is only for the purpose of aiding in the field identification of the equipment.

Equipment Tag No.	Equipment New Tag No.	Rating in Permits 9373-AA004 & 9773-AC016	New Revised Rating	Explanation
Group I - Gas-Fired Turbines				
C2-2101-A C2-2101-B C2-2101-C G-201-A G-201-B G-201-C G-201-D G-3201-E G-3201-F P-2202-A P-2202-B P-CL07-A P-CL07-B	No change	15,140 hp ISO 15,140 hp ISO 15,140 hp ISO 4,900 hp ISO 4,900 hp ISO 4,900 hp ISO 4,900 hp ISO 4,900 hp ISO 4,900 hp ISO 5,400 hp ISO 5,400 hp ISO 5,400 hp ISO 5,400 hp ISO	No change	
G-3203	Added in 9773-AC016	38,932 kW ISO	53,500 hp (39,930 kW ISO)	G-3203 (GE Frame 6) was installed in 1999 permitted under 9773-AC016 rev.1, 6/27/01. Rating is revised based on new information from GE, per 8/30/02 permit application.
Group II - Gas-Fired Heaters				
H-201 G1-14-01 H-3204 H-102A	No change No change Added in 9773-AC016	27.8 MMBtu/hr 40 MMBtu/hr 8 MMBtu/hr 3.5 MMBtu/Hr	No Change 44.4 MMBtu/hr 9.7 MMBtu/hr 4.375 MMBtu/hr	New information per 8/30/02 application. Correct maximum design rating. New information (12/23/02 CPAI comment)
E-CL06-A E-CL06-B	Not included. Not included.	15.1 MMBtu/hr 15.1 MMBtu/hr		ECL06-A & B are no longer in service per 8/30/02 application.
Group III - Diesel Fired Equipment				
Not in previous permits.	G-701-A G-701-B P-CL04-ECC P-1A02 P-1E02 P-1F02 P-1G02 P-1L02 P-1Q02 P-1R02 P-1Y02	No values	1,086 hp 1,086 hp 215 hp 240 hp 240 hp 318 hp 318 hp 300 hp 300 hp 300 hp 300 hp	Not included in previous permit. Provided in the source list of 8/30/02 application.
Group IV - Flares				
Existing (All Flares) – Not identified in	H-101B H-KF01 H-KF02	1.6 MMscf/day	1.6 MMscf/day (pilot, purge, assist) combined	New information per 8/30/02 application.

Equipment Tag No.	Equipment New Tag No.	Rating in Permits 9373-AA004 & 9773-AC016	New Revised Rating	Explanation
previous permit.	H-CR01A H-CR01B		total for all flares.	
Group V - Incinerators				
H-250 H-347	No change No change	1,300 lb/hr 765 lb/hr	No change 900 lb/hr	New information per 8/30/02 application. Correct maximum design rating.
Group VI - Other Equipment (Drill Site Heaters)				
12 DS Heaters: 1A 1B 1C 1D (not in service) 1E 1F 1G 1H 1Q 1R 1Y 1L 1M	 H-1A01 H-1B01 H-2V01 H-3F01 H-1E01 H-1F01 H-1G01 H-1F-1901 H-1Q01 H-1R01 H-1Y01 Not included. Not included.	 200.3 MMBtu/hr 11.0 MMBtu/hr 11.0 MMBtu/hr 11.0 MMBtu/hr Not Listed 11.0 MMBtu/hr 10.0 MMBtu/hr 10.0 MMBtu/hr 11.0 MMBtu/hr 14.1 MMBtu/hr 11.5 MMBtu/hr 10.0 MMBtu/hr 9.7 MMBtu/hr 15.0 MMBtu/hr	 16.4 MMBtu/hr 16.4 MMBtu/hr 14.5 MMBtu/hr 19.6 MMBtu/hr 16.4 MMBtu/hr 14.9 MMBtu/hr 14.9 MMBtu/hr 16.4 MMBtu/hr 21.0 MMBtu/hr 17.2 MMBtu/hr 14.9 MMBtu/hr Not in service. Not in service.	New information per 8/30/02 application. Correct maximum design rating and specific equipment ID. There are no heaters in service at DS1L and DS1M per 8/30/02 application. Heater at DS1D is now in service per 8/30/02 application.
Group VII - Fixed Roof Storage Tanks (>10,000 gallon capacity)				
Not in previous permit.	T-201 T-175 T-176 T-177 T-178 T1-P101A T1-P101B G-19501 G-19502 G-19503 G-19504 X-CPF1-TEG T-1009 T-1H01	No Values	2,000 bbls 595 bbls 595 bbls 476 bbls 357 bbls 55,000 bbls 55,000 bbls 3,000 bbls 3,000 bbls 3,000 bbls 9,900 bbls 270 bbls 870 bbls 870 bbls	The storage tanks were not regulated under previous permit.

EXHIBIT B
Air Contaminant Emission Limits, Standards, Fuel Specifications, and Operating Limits

Permittee shall operate each source in compliance with the applicable emission standards specified by 18 AAC 50.040-060 (including Condition 7 of this permit), by an applicable federal New Source Performance Standard or National Emission Standard for Hazardous Air Pollutants, by limits established as the result of a BACT or LAER determination, or the requested emission limits, standards, fuel specifications, and operating limits listed below, whichever is most stringent. All emission limitations are annual average, unless otherwise noted.

Note: In the tables below all turbine group emission limits for NOx refer to full load, ISO conditions. All other emission limits refer to full load, standard conditions.

Sources (Turbines): GE Frame 3 Turbines (C-2101-A, C-2101-B, and C-2101-C), EGT (Ruston) TB5000 Turbines (G-201-A, G-201-B, G-201-C, G-201-D, G-3201-E, and G-3201-F), and EGT (Ruston) TB5400 Turbines (P-2202-A, P-2202-B, P-CL07-A, and P-CL07-B)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
NO_X	GE Frame 3	150 ppmvd @ 15% O_2 and 420.5 tpy for each unit	150 ppmvd @ 15% O_2	EPA PSD BACT and 10/7/97 permit revision
	EGT (Ruston) TB5000 Series	153 ppmvd @ 15 % O_2	153 ppmvd @15% O_2 for G-3201-E & F [150(14.4/Y); Y = 14.1 kJ/W-hr] No limit for G-201- (A through D); value is estimate only.	EPA PSD BACT and 10/7/97 permit revision. No limit for G-201-(A through D), because sources are pre-PSD.
	EGT (Ruston) TB5400 Series	115 ppmvd @ 15 % O_2 and 98.1 tpy for each unit	115 ppmvd @ 15 % O_2	EPA PSD BACT and 10/7/97 permit revision
	All units, except G-201-(A through D)		2,046 tpy total	EPA PSD BACT and 10/7/97 permit revision
SO_2	GE Frame 3	200 ppmv H_2S in fuel gas	For all units: 200 ppmv H_2S in fuel gas 109 tpy total combined, except G-201-(A through D)	Carried forward. EPA PSD BACT and 10/7/97 permit revision
	EGT (Ruston) TB5000 Series	200 ppmv H_2S in fuel gas		
	EGT (Ruston) TB5400 Series	200 ppmv H_2S in fuel gas		
CO	GE Frame 3	109 lb/MMscf and 70.7 tpy for each unit	For all units: 0.17 lb/MMBtu for each unit 612 tpy total combined for all units, except G-201- (A through D). No limit for G-201- (A through D); value is estimate only.	EPA PSD BACT and 10/7/97 permit revision and new information No limit for G-201-(A through D) because sources are pre-PSD.
	EGT (Ruston) TB5000 Series	109 lb/MMscf		
	EGT (Ruston) TB5400 Series	109 lb/MMscf and 23.4 tpy for each unit		

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
PM	GE Frame 3	14.0 lb/MMscf 9.1 tpy for each unit 0.05 grains/dscf (3-hr avg.)	For all units except G-201- (A through D): 50 tpy total combined No lb/MMscf limit for any units; value is estimate only. For each unit: 0.05 grains/dscf (3-hr avg.)	Tons per year limit established by EPA PSD BACT and 10/7/97 permit revision. EPA did not establish a lb/MMscf limit. No limit for G-201- (A through D) because sources are pre-PSD. PM standard set by 18 AAC 50.055(b)(1)
	EGT (Ruston) TB5000 Series	14.0 lb/MMscf 2.8 tpy for each unit 0.05 grains/dscf (3-hr avg.)		
	EGT (Ruston) TB5400 Series	14.0 lb/MMscf 2.8 tpy for each unit 0.05 grains/dscf (3-hr avg.)		
Opacity	GE Frame 3	For each unit: 20%, 3 min/hr	For each unit: 20%, 3 min/hr 20%, consecutive 6 min. average 10%, consecutive 6 minute average except G-201-(A through D)	20% limit set by 18 AAC 50.055(a)(1), 1/18/97 & 5/3/02. 10% limit set by EPA PSD BACT and 10/7/97 permit revision. Does not apply to pre-PSD sources, G-201- (A through D)
	EGT (Ruston) TB5000 Series			
	EGT (Ruston) TB5400 Series			
VOC	GE Frame 3	2.3 lb/MMscf and 1.5 tpy for each unit	For all units except G-201-(A through D): 7.5 tpy total No limit for G-201- (A through D); value is estimate only.	EPA PSD BACT and 10/7/97 permit revision. No limit for G-201- (A through D) because sources are pre-PSD.
	EGT (Ruston) TB5000 Series	0.2 lb/MMscf		
	EGT (Ruston) TB5400 Series	2.3 lb/MMscf and 0.5 tpy for each unit		

Source (Turbine): GE Frame 6 Turbine (G-3203),

Pollutant	Source(s)	Limits in AQC Construction Permit No. 9773-AA016	Revised Limits	Explanation
NO_X	G-3203	150 ppmvd @15% O_2 and 266 lbs/hr	No Change	Carried forward. ADEC BACT limit
SO_2	G-3203	200 ppmv H_2S in fuel gas (24-hr avg.)	No Change	Carried forward. ADEC BACT limit
Opacity	G-3203	20% opacity (3 minutes in any hour)	20% opacity (3 minutes in any hour) 20% opacity (consecutive 6-minute avg.)	Per 18 AAC 50.055(a)(1) revised 5/3/02
PM	G-3203	0.05 grains/dscf (3-hr avg.)	No Change	

Sources (Heaters): Broach Dual-fired Heater (H-201); Born Crude Heater (G1-14-01); and Drill Site Heaters (H-1A01, H-1B01, H-2V01, H-3F01, H-1E01, H-1F01, H-1G01, H-1F-1901, H-1Q01, H-1R01, H-1Y01)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
NO_X	Broach Heater	140 lb/MMscf	No limit. Value is emission estimate only.	No limit for H-201; source is a pre-PSD.
	Born Heater	0.10 lb/MMBtu	For Born and drill site heaters: 0.10 lb/MMBtu each unit and 124 tpy (total combined)	EPA PSD BACT and 10/7/97 permit revision.
	Drill Site Heaters	0.10 lb/MMBtu		
SO_2	Broach Heater	200 ppmv H_2S in fuel gas	200 ppmv H_2S in fuel gas	Carried forward.
	Born Heater	168 ppmv H_2S in fuel gas and 4.5 tpy	162 ppmv H_2S in fuel gas (running 3-hr average)	The limit in 40 CFR 60.104(a)(1) converts to 162 ppmv @ 59ºF. Ton per year limit is now rolled into the group limit.
	Drill Site Heaters	200 ppmv H_2S in fuel gas	200 ppmv H_2S in fuel gas	Carried forward.
			33 tpy (total for all units except H-201)	EPA PSD BACT and 10/7/97 permit revision
CO	Broach Heater	35 lb/MMscf	No limit. Value is emission estimate only.	No limit for H-201; source is pre-PSD.
	Born Heater	0.018 lb/MMBtu	For Born and drill site heaters: 0.035 lb/MMBtu each unit and 44 tpy, (total combined)	EPA PSD BACT and 10/7/97 permit revision and new information
	Drill Site Heaters	0.018 lb/MMBtu		
Opacity	All Units: Broach, Born, and Drill Site Heaters	20%, 3 min/hr	20%, 3 min/hr 20%, consecutive 6 min. average	Opacity standard set by 18 AAC 50.055(a)(1), 1/18/97 & 5/3/02.
PM	Broach Heater	0.05 grains/dscf (3-hr. average) 6.2 lb/MMscf	For each source: 0.05 grains/dscf (3-hr avg.) 14 tpy (total for all units except H-201) No lb/MMscf limit for any units; value is estimate only	PM standard set by 18 AAC 50.055(b)(1) Tons per year limit established by EPA PSD BACT and 10/7/97 permit revision. EPA did not establish a lb/MMscf limit.
	Born Heater	0.05 grains/dscf (3-hr average) 6.2 lb/MMscf		
	Drill Site Heaters	0.05 grains/dscf (3-hr average) 6.2 lb/MMscf		
VOC	Broach Heater	2.8 lb/MMscf	No Limit	No BACT or other limits apply. EPA did not establish VOC limits for heaters.
	Born Heater	2.8 lb/MMscf	No Limit	
	Drill Site Heaters	2.8 lb/MMscf	No Limit	

Source (Heaters) : Kvaerner Fuel Gas Heater (H-3204) and ICE Air Heater (H-102A)

Pollutant	Source(s)	Limits in AQC Construction Permit No. 9773-AA016	Revised Limits	Explanation
NO_X	H-3204	0.1 lb/MMBtu	No Change	Carried forward. ADEC BACT limit
SO_2	H-3204	200 ppmv H_2S in fuel gas (24-hr avg.)	No Change	Carried forward. ADEC BACT limit
	H-102A	0.5% sulfur content in liquid fuel	No change	Carried forward.
Opacity	H-3204 and H-102A	20% opacity (3 minutes in any hour)	20% opacity (3 minutes in any hour) 20% opacity (consecutive 6-minutes avg.)	Per 18 AAC 50.055(a)(1) revised 5/3/02
PM	H-3204 and H-102A	0.05 grains/dscf (3-hr avg.)	No Change	Carried forward.

Sources : Incinerators (H-250 and H-347)

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
NO_X	H-250	No limit	No limit.	Source was installed before PSD permit program.
	H-347	No limit	8 tpy	EPA PSD BACT and 10/7/97 permit revision
SO_2	H-250	200 ppmv H_2S in fuel gas	No change.	Carried forward.
		0.5% sulfur content in liquid fuel	No limit.	The incinerator supplemental burners do not use liquid fuel.
	H-347	200 ppmv H_2S in fuel gas	200 ppmv H_2S in fuel gas and 4 tpy	EPA PSD BACT and 10/7/97 permit revision
		0.5% sulfur content in liquid fuel	No limit.	The incinerator supplemental burners do not use liquid fuel.
CO	H-250	No limit	No limit	Source was installed before PSD permit program.
	H-347	No limit	17 tpy	EPA PSD BACT and 10/7/97 permit revision
Opacity	H-250	For each unit: 20%, 3 min/hr	For each unit: 20%, 3 min/hr 20%, consecutive 6 min. avg.	Opacity standard set by 18 AAC 50.050(a), 1/18/97 & 5/3/02.
	H-347		For H-347: 10%, consecutive 6 min. avg.	EPA PSD BACT and 10/7/97 permit revision
PM	H-250	0.15 grain/dscf	0.15 grain/dscf @ 12% CO_2 (3-hr average)	PM standard set by 18 AAC 50.050(b). Carried forward.

Pollutant	Source(s)	Limits in AQCP to Operate No. 9373-AA004	Revised Limits	Explanation
	H-347	0.1 grain/dscf	0.10 grain/dscf @ 12% CO_2 and 12 tpy	EPA PSD BACT and 10/7/97 permit revision
VOC	H-250	No limit	No limit	Source was installed before PSD permit program.
	H-347	No limit	5.3 tpy	EPA PSD BACT and 10/7/97 permit revision adjusted from 0.5 to 5.3 tpy to account for the typographical error found in the EPA PSD permit.

Source (Flares): McGill Emergency Flares (H-101B, H-CR01A and H-CR01B) and Kaldair Smokeless Emergency Flares (H-KF01 and H-KF02)

Pollutant	Limits in AQCP to Operate No. 9373-AA004	Revised Limit	Explanation
NO_X	No limit	No limit.	No BACT limits apply.
SO_2	200 ppm H_2S in fuel gas	No change	Carried forward.
CO	No limit	No limit.	No BACT limits apply.
Opacity	20%, 3 min/hr	20%, 3 min/hr 20%, consecutive 6 min. avg. For smokeless flares (H-KF01 and H-KF02): No visible emissions (except for periods not to exceed 5 minutes in any two hours).	18 AAC 50.050(a), 1/18/97 & 5/3/02. 40 CFR 60.18(c)(1), Subpart A – General Control Device Requirements.
PM	0.05 grains/dscf (3-hr avg.)	No change	Carried forward. PM standard set by 18 AAC 50.055(b)(1)
VOC	No limit	No limit.	No BACT limits apply.

EXHIBIT C
Process Monitoring Requirements

Permittee shall install, calibrate, operate, and maintain in good working order air contaminant emissions and process monitoring equipment on the sources described below.

MONITORING AND REPORTING REQUIREMENTS

Gas Turbines and Heaters Groups I & II	A fuel gas meter, which indicates the volume of natural gas consumed in each group, must be installed or other means of estimating fuel consumption must be provided.
Fuel Gas	Determine the sulfur (H_2S) content of the natural gas burned as fuel once each month. Acceptable methods are ASTM D-4810-88, ASTM 4913-89, Gas Producers Assn. (GPA) method 2377-86 or an alternative analytical method approved by the Department. A reading from the KUTP continuous monitoring system, which monitors CPF-1 plant fuel gas, is also acceptable for reporting the H_2S content of the fuel gas.
KUTP Crude Heater G1-14-01	Permittee shall install, maintain, and operate in good working order a CEMS for recording and monitoring hydrogen sulfide content of the fuel burned in the KUTP crude heater which contains a component of the process gas generated within KUTP. This system shall be installed and calibrated according to 40 CFR Part 60, Appendix B, Performance Specification 7.

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY CONTROL MINOR PERMIT

Permit No. AQ0267MSS06 Date – Final - March 28, 2014
Rescinds Permit No. AQ0267MSS02

The Department of Environmental Conservation, under the authority of AS 46.14 and 18 AAC 50, issues this Air Quality Control Minor Permit to:

Owner(s):	ConocoPhillips Alaska, Inc. BP Exploration (Alaska), Inc. ExxonMobil Alaska Production, Inc. Union Oil Company of California
Operator:	ConocoPhillips Alaska, Inc. P.O. Box 100360 Anchorage, AK 99510-0360
Stationary Source:	Kuparuk Central Production Facility #1
Location:	Section 9, Township 11N, Range 10E (for Production Pad) Sections 16 & 21, Township 11N, Range 10E (for DS1E) Section 35, Township 11N, Range 10E (for DS1J), Umiat Meridian
Physical Address:	Kuparuk River Unit
Project:	Removing Drill Rig Conditions in Permit AQ0267MSS02
Permit Contact:	Brad Thomas (907) 263-4741, Brad.C.Thomas@conocphillips.com

This permit is issued under 18 AAC 50.508(6) to revise permit terms and conditions of a minor permit in accordance with the terms and conditions of this permit and as described in the original permit application, except as specified in this permit. The permit satisfies the obligation of the Permittee to obtain a minor permit under 18 AAC 50. As required under AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this permit.

John F. Kuterbach

John F. Kuterbach, Manager
Air Permits Program

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List of Abbreviations Used in this Permit

AAC......................Alaska Administrative Code
AS.........................Alaska Statutes
DS1E.....................Drill Site 1E
DS1J......................Drill Site 1J
MMBtu/hr............Million British thermal units per hour
PSD.......................Prevention of Significant Deterioration
SO_2.......................Sulfur dioxide

Section 1. Authorization and PSD Major Modification Avoidance

1. The Permittee is authorized to operate the permanent operations emission units listed in Table 1.

Table 1: Permanent Operations Emission Unit

Unit	Equipment Use	Description	Rating
Heaters – Gas Fired	DS1E and DS1J Production Heaters	Unknown	Up to a maximum of 184 MMBtu/hr

2. If permit terms and conditions in this permit conflict with other previous permits, comply with terms and conditions of this permit.

Limits to Avoid Prevention of Significant Deterioration (PSD) Major Modification

3. Limit total nitrogen oxides (NOx) emissions from Emission Units C-2101A, C-2101B and C-2101C listed in the operating permit issued to the stationary source under AS 46.14.130(b) and 18 AAC 50, to no greater than 824 tons per 12 consecutive month period. Monitor record and report NOx emissions, as described in the operating permit issued for the source under AS 46.14.130(b) and 18 AAC 50.

4. The Permittee shall limit the combined total heat input rating of the production heaters listed in Table 1 to no more than 184 million British thermal units per hour (MMBtu/hr) heat input rate.

5. The Permittee shall not burn fuel gas with hydrogen sulfide greater than 275 parts per million by volume dry at DS1E and DS1J.

5.1 Monitor, record and report in accordance with fuel gas hydrogen sulfide monitoring requirements described in the operating permit issued for the source under AS 46 14 130(b) and 18 AAC 50.

5.2 Report Excess Emissions and Permit Deviations as described in the operating permit issued for the source under AS 46 14.130(b) and 18 AAC 50 anytime the fuel sulfur determined under Condition 5.1 exceeds the limit in Condition 5.

6. The Permittee shall limit combined sulfur dioxide (SO_2) emissions from the production heaters listed in Table 1 to no greater than 35 tons per 12 consecutive month period.

6.1 For the production heaters, monitor and record the monthly fuel gas consumption. Calculate and record the total SO_2 emissions from the production heaters for each calendar month using fuel consumption and fuel sulfur content measured in Condition 5.1. If the consumption records are missing or incomplete for any emission unit, estimate SO_2 emissions based on operating hours and maximum design fuel consumption rates.

6.2 Report the 12 consecutive month SO_2 emissions for the production heaters for each month of the reporting period in the operating report described in the operating permit issued for the source under AS 46 14.130(b) and 18 AAC 50.

Section 2. State Emission Standards

Visible Emissions

7. The Permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from fuel burning equipment listed in Table 1, to reduce visibility through the exhaust effluent by more than 20 percent averaged over any six consecutive minutes.

7.1 For the production heaters, burn only gas. Certify in each Annual Compliance Certification as described in the operating permit issued for the source under AS 46.14 130(b) and 18 AAC 50 whether each of these units fired only gas.

Particulate Matter

8. The Permittee shall not cause or allow particulate matter emitted from fuel burning equipment listed in Table 1 to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

8.1 For the production heaters at DS1E and DS1J, monitor in accordance with Condition 7.1.

Sulfur Compound Emissions

9. The Permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, from fuel burning equipment listed in Table 1, to exceed 500 parts per million averaged over three hours. Ensure compliance with this requirement by complying with Condition 5.

Section 3. Emission Fees

10. Assessable Emissions: The Permittee shall pay to the Department annual emission fees based on the stationary source's assessable emissions, as determined by the Department under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410. The Department will assess fees per ton of each air pollutant that the stationary source emits or has the potential to emit in quantities greater than 10 tons per year. The quantity for which fees will be assessed is the lesser of

10.1 the stationary source's assessable potential to emit of 5,309 tons per year; or

10.2 the stationary source's projected annual rate of emissions that will occur from July 1 to the following June 30, based upon actual annual emissions emitted during the most recent calendar year or another 12-month period approved in writing by the Department, when demonstrated by

a. an enforceable test method described in 18 AAC 50.220;

b. material balance calculations;

c. emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or

d. other methods and calculations approved by the Department.

11. Assessable Emission Estimates: Emission fees for the stationary source will be assessed as follows:

11.1 no later than March 31 of each year, the Permittee may submit an estimate of the stationary source's assessable emissions to ADEC, Air Permits Program, ATTN: Assessable Emissions Estimate, 410 Willoughby Ave., Juneau, AK 99801-1795; the submittal must include all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the Department can verify the estimates; or

11.2 if no estimate is submitted on or before March 31 of each year, emission fees for the next fiscal year will be based on the stationary source's potential to emit set out in Condition 10.1.

Section 4. Permit Documentation

November 22, 2013: CPAI submits application to revise AQ0267MSS02

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR PERMITS PROGRAM

TECHNICAL ANALYSIS REPORT
for
Air Quality Control Minor Permit AQ0267MSS06

ConocoPhillips Alaska Inc.
Central Processing Facility-1 Drill Sites 1E and 1J

Removing Drill Rig Conditions in Permit AQ0267MSS02

Prepared by: Kwame Agyei
Supervisor: Zeena Siddeek
Date: Final - March 28, 2014

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ABBREVIATIONS/ACRONYMS

Acronyms

AAC........................Alaska Administrative Code
ADEC......................Alaska Department of Environmental Conservation
AS ....Alaska Statutes
C.F.R. ....Code of Federal Regulations
CPAI ....ConocoPhillips Alaska Inc
CPF-1 ....Central Production Facility #1
Department.............Alaska Department of Environmental Conservation
DS1E.......................Drill Site 1E of CPF-1
DS1J........................Drill Site 1J of CPF-1
MR&R.....................Monitoring, Recordkeeping, and Reporting
PSD ....Prevention of Significant Deterioration

Units and Measures

MMBtu/hr ....million British thermal units per hour
tpy ....tons per year

Pollutants

NOx.........................Oxides of Nitrogen
SO_2 ....Sulfur Dioxide

1.0 Introduction

This Technical Analysis Report provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Air Quality Control Minor Permit AQ0267MSS06 to ConocoPhillips Alaska Inc. (CPAI) for the Central Production Facility-1 (CPF-1) Drill Sites 1E (DS1E) and Drill Sites 1J (DS1J) under 18 AAC 50.508(6) to rescind Permit AQ0267MSS02. CPAI submitted the minor permit application on November 22, 2013. AQ0267MSS06 incorporates changes requested by CPAI and rescinds Minor Permit AQ0267MSS02.CONOCOPHILLIPS Alaska Inc.

1.1 Stationary Source Description

The CPF-1 is an existing stationary source classified as a Petroleum and Natural Gas Production facility. DS1E and DS1J are part of CPF-1. CPF-1 consists of several turbines, engines, heaters, incinerators, and flares. This projects concerns only the DS1E and DS1J sites of CPF-1. The emission units operated at DS1E and DS1J as listed in this permit are the GTS Energy Production Heater with Tag No. H-1E02 at DS1E and Petrochem Development Heater with Tag No. H-1J01A and Petrochem Development Heater with Tag No. H-1J01B at DS1J. These emission units are gas-fired with a combined rating of 103.6 million British thermal units per hour (MMBtu/hr), which is less than the maximum combined rating of 184 MMBtu/hr[1] allowed by this permit.

CPAI currently operates CPF-1 under Permits 267CP01, 9773-AC016, AQ0267MSS02, AQ0267MSS03, AQ0267MSS04, AQ0267MSS05, and expired Operating Permit AQ0267TVP01 under shield.

1.2 Application Description

CPAI submitted an application under 18 AAC 50.508(6) to remove the ambient air quality restrictions on drilling activities at DS1E and DSIJ. These ambient air restrictions were established in Permit 267CP02 and carried over to AQ0267MSS02 through a series of permit revisions. AQ0267MSS02 contains ambient air conditions for construction drilling, post-construction drilling, and non-drilling activities at DS1E and DS1J. The conditions and terms in AQ0267MSS02 pertaining to drilling operations as authorized under this permit have been completed. CPAI requested the Department remove these obsolete conditions and make other typographical revisions. Table 1 summarizes the specific revisions requested.

[1] A Latoka heater with tag no. H-1E01 is also operated at DS1E. It was installed in 1981 and is not part of the project authorized by this permit.

Table 1: Changes Requested in AQ0267MSS02

Condition	Description of Condition in AQ0267MSS02	Requested Revision and Basis of Request
1	Authorization to install and operate the generic emission units listed in Section 5, Table 1 and Table 2	Delete Table 1. Re-label Table 2 as Table 1. CPAI has removed the emissions units in Table 1
3, 4	Post-construction drilling ambient air quality exclusion zone	Delete the conditions and footnote associated with Condition 3. Post-construction drilling is complete and the conditions are obsolete
6	Off-permit change notification for drilling support equipment exceeding 400 horsepower brought to DS1E or DS1J	Delete obsolete condition. The reported information pertained to modeling associated with the completed project drilling operations
7	Document commencement and completion of construction and post-construction drilling	Delete obsolete condition and associated footnote. Construction and post-construction drilling project completed
8, 9	Limits on fuel consumption of drill rig operations	Delete obsolete condition and associated footnote. Drilling completed
10	Limits on fuel consumption of drill rig and well servicing operations	Delete. Conditions are obsolete
11	Monitor, record, and report fuel consumption by drill rig and well servicing operations	Delete. Conditions are obsolete
12	Limits on fuel consumption by well servicing operations	Delete obsolete condition and associated footnote. Project is completed. The Kuparuk Transportable Drill Rig Title V permit which covers portable oil and gas operations will cover future drilling at these sites
13	Limit on fuel consumed by portable flare	Delete. CPAI has removed the flare.
17	Limits on well flowback emissions for Prevention of Significance Deterioration (PSD) avoidance	Delete obsolete condition. The project is completed. Emissions limits associated with project-specific flowback and Temporary Crude Oil Storage Tanks no longer apply.
5	Limit total nitrogen oxides (NOx) from emission units with Tag Nos. C-201A, C-2101B, and C-2101C to no more than 824 tons per year (tpy) as described in Permit 267TVP01	Replace 267TVP01 with 'applicable operating permit issued under AS 46.14.130(b) and 18 AAC 50' to reflect current Department permit language
15, 15.1 and 15.2	Permittee shall not burn fuel oil with sulfur content exceeding 0.150 percent sulfur by weight and field gas with hydrogen sulfide content no greater than 275 parts per million by volume dry	Delete 'fuel oil' from the condition because the liquid fuel sulfur content limit no longer applies.
15.1	Monitor, record, and report sulfur and hydrogen sulfide content as described in Permit 267TVP01	Revise using current Department permit language
15.2	Report Excess Emissions and Deviations as described in Permit 267TVP01	Revise using current Department permit language
16	Limit combined sulfur dioxide (SO_2) emissions from drill rig heaters and boilers listed in Table 1 and production heaters listed in Table 2 to no greater than 35 tons per year.	Delete the drill rig and heaters and boilers from the condition. CPAI has removed the equipment.
16.1	Calculate and record SO_2 emissions from drill rig heaters and boilers for each month	Delete. CPAI has removed the equipment
16.3	For the portable flare, calculate and record SO_2 emissions for each month	Delete. CPAI has removed the flare.
16.4	Calculate and record rolling 12-month SO_2 emissions from drill rig heaters, production heaters, and portable fare	Delete drill rig heaters and portable flare from the condition. CPAI has removed them.
16.5	Report the rolling 12-months from Condition	Delete drill rig heaters and portable flare from

Condition	Description of Condition in AQ0267MSS02	Requested Revision and Basis of Request
	16.4	the condition. CPAI has removed them. Use current Department permit language
18, 18.a, and 18.b	Visible emissions standard	Delete unnecessary leading phrase 'Except for nonroad engines'. Use current Department permit language and correct formatting.
18.1, 18.2, and 18.4	Visible emissions monitoring, recording, and reporting (MR&R) for the drill rig boilers and heaters and portable flare	Delete the condition. The portable oil and gas operations permit will cover drilling activities. Deleted associated footnotes.
18.3	Visible emissions MR&R for the production heaters	Revise using current Department permit language
19	Particulate Matter standard	Delete unnecessary leading phrase' Except for nonroad engines'. Use current Department permit language and correct formatting
19.1, 19.3	Particulate Matter MR&R for rig camp engines, drill rig boilers and heaters	Obsolete. POGO permit will cover any required drilling activities.
20	SO_2 standard	Delete unnecessary leading phrase 'Except for nonroad engines'.
21, 21.1, and 21.2	Emission fees	Revise to include only fees from the entire CPF-1 stationary source. Use current Department permit language
22.2	Emission fees for next fiscal year	Replace 'received' with 'submitted'.
Section 4	Public Access Control	Delete. Construction and post-construction done
Table 1	Generic Transportable Drilling Operations Units	CPAI removed the emissions units
Table 2	Permanent Operations Emission Units	Delete portable flare from the table. CPAI no longer uses the flare

1.3 Effect of Revisions

The Department removed generic transportable drilling operation equipment and the portable flare from the emission unit inventory of DS1E and DS1J. The Department deleted conditions associated with the removed equipment and completed operations. AQ0267MSS06 carried forward the conditions for operation of production heaters to a cumulative capacity up to a maximum of 184 MMBtu/hr at DS1E and DS1J.

1.4 Emissions Summary and Permit Applicability

The applicant requested to retain the 35 tons per year (tpy) of sulfur dioxide (SO_2) owner requested limit for DS1E and DS1J and provided estimated potential emissions to support the potential-to-emit.

1.5 Department Findings

Based on the review of the application, the Department finds that:

1. This project is classified under 18 AAC 50.508(6) to revise permit conditions in an existing Title 1 permit.
2. Turbines with Tag Nos. Tag Nos. C-2101A, C-2101B, and C-2101C are subject to a NOx Prevention of Significant Deterioration (PSD) avoidance limit. The production heaters listed in this permit are subject to a SO_2 PSD avoidance limit. These PSD avoidance limits were established in 267CP02 and carried forward to AQ0267MSS02.
3. The applicant proposes to retain the permanent heaters at DS1E and DS1J. These units

contain PSD avoidance limits established in 267CP02 and carried forward to AQ0267MSS02.

4. The application contains the elements listed in 18 AAC 50.540(k).

2.0 Permit Requirements

18 AAC 50.544 describes the elements that the Department must include in minor permits. This section of the TAR provides the technical and regulatory basis for the permit requirements in AQ0267MSS06, which is classified under 18 AAC 50.508(6).

2.1 General Requirements for all Minor Permits

As described in 18 AAC 50.544(a)(1), this minor permit identifies the stationary source, the project, the Permittee, and contact information in the cover page.

Emission fee requirements are required for each minor permit issued under 18 AAC 50.542, as described in 18 AAC 50.544(a)(2). The assessable emissions are 5,309 tpy. These assessable emissions do not include emissions from non-road engines[2]. Section 3 of the permit contains requirements for emission fees.

The permit does not contain conditions for ambient air quality protection.

2.2 Requirements for a Permit Classified under 18 AAC 50.508(6)

As required in 18 AAC 50.544(i), this minor permit contains terms and conditions necessary to ensure that the Permittee will operate the stationary source in accordance with 18 AAC 50.

The Department revised AQ0267MSS02 based on CPAI’s request to remove obsolete conditions.

3.0 Permit Administration

CPAI is operating the stationary source under shield of the expired Operating Permit AQ0267TVP01. Since the active operating permit for the stationary source is still AQ0267TVP01 Revision 2 and AQ0267TVP01 Revision 2 contains drill rig conditions that Minor Permit AQ0267MSS06 has deleted, the Permittee cannot operate under Operating Permit AQ0267TVP01 Revision 2 and Minor Permit AQ0267MSS06 simultaneously.

Therefore, the CPAI cannot operate under Minor Permit AQ0267MSS06 until the Department issues a renewal operating permit or a revised operating permit that contains the terms and provisions of Minor Permit AQ0267MSS06.

[2] April 28, 2009 email from Department Program Manager (John Kuterbach) to Department staff, *When are nonroad engines charged emission fees?*

Response to Comments on Preliminary Minor Permit No. AQ0267MSS06 ConocoPhillips Alaska, Inc. – Kuparuk Central Production Facility #1

Prepared by Kwame Agyei, March 28, 2014

This document provides the Alaska Department of Environmental Conservation's (Department's) reply to all public comments on the preliminary decision to issue minor permit No. AQ0267MSS06 to the ConocoPhillips Alaska, Inc, for the Kuparuk Central Production Facility #1 at the Kuparuk River Unit. The Department provided opportunity for public comment on the permit starting February 24, 2014 and ending March 26, 2014.

The Department's responses are shown in *Times New Roman italic font*.

Commenter: Brad Thomas, Sr. Environmental Scientist, ConocoPhillips Alaska , Inc.

Comments on the permit, reproduced verbatim:

1. **Cover Page, last paragraph**
   Requested Change: Correct a typographical error as shown in the marked-up permit.

   <u>Response:</u> The Department corrected 'required AS 46.14.120(c)' to 'required under AS 46.14.120(c)' as requested.

2. **Section 1, Table 1**

   Requested Change: Add clarifying language as shown in the marked-up minor permit regarding the rating of the installed heaters and to make the table consistent with the limit stated in Condition 4 of the preliminary minor permit.

   <u>Response:</u> The Department revised the rating in Table 1 from '184 MMBtu/hr' to 'Up to a maximum of 184 MMBtu/hr' as requested.

3. **Conditions 5.1, 5.2, and 6.2**

   Requested Change: Change AS 14.130(b) to AS 46.14.130(b) to correct a typographical error in the citation of the Alaska Statutes.

   <u>Response:</u> The Department corrected 'AS 14.130(b)' in Conditions 5.1, 5.2, and 6.2 to 'AS 46.14.130(b)' as requested.

4. **Condition 10.1**

   Requested Change: Change the assessable PTE value presented in Condition 10.1 of the preliminary permit to match the CPF-1 assessable PTE value stated in Condition 75.1 of the EPA draft CPF-1 Title V permit (5,309 tpy).

   <u>Response:</u> The Department revised the assessable PTE from '5,310' tpy to '5,309' tpy as requested.

Comments on the TAR, reproduced verbatim:

5. **ABBREVIATIONS / ACRONYMS**
Requested Change: Correct typographical errors as shown in the attached marked-up Technical Analysis Report.

Response: *The Department revised 'Central Processing Facility #1' to 'Central Production Facility #1' and revised 'Monitoring, Recording, and Reporting' to 'Monitoring, Recordkeeping, and Reporting' as requested.*

6. **Section 1 Introduction**

Requested Change: Correct typographical errors as shown in the attached marked-up Technical Analysis Report.

Response: *The Department revised 'Permit' to 'Minor Permit' and revised 'Central Processing Facility #1' to 'Central Production Facility #1' as requested.*

7. **Section 1.1 Stationary Source Description**

Requested Change: Revise as shown in the marked up Technical Analysis Report

Basis: There are no boilers at CPF-1.

The proposed revision to the presentation of the DS1E and DS1J emission unit inventory clarifies the existence of another heater at DS1E that pre-dates the heaters installed as part of the project authorized by this permit and its predecessors, as described in the proposed footnote (1).

The revisions to the combined rating and associated text states the correct combined rating of the heaters installed and authorized by this permit, which is not 184 MMBtu/hr, but rather is less than that maximum allowed rating.

The revision to the list of current permits under CPF-1 is operated corrects the reference to Permit 267CP01. We believe permit 267CP01 has been renumbered/renamed as Permit 267CPT01 or AQ0267CPT01.

Response: *The Department revised Section 1.1 (Stationary Source Description), except that the Department did not change '267CP01' to '267CPT01'. The Department has re-numbered some permits to match current naming conventions but the old permit numbers are the legal numbers. To avoid confusing Permittees, the Department uses the permit's legal numbers in official documents. In this instance, ConocoPhillips should have a permit labeled as 267CP01 in their records but may not have 267CPT01 in their records.*

8. Section 1.2 Application Description

Requested Change: Revise as shown in marked up Technical Analysis Report.

Basis: Our proposed revisions correct typographical errors and clarify the permit history.

Response: The Department revised Section 1.2 (Application Description) as requested. The revisions clarify the permit history of the stationary source.

9. **Table 1: Changes Requested in AQ0267MSS0**2

Requested Change: Revise as shown in marked up Technical Analysis Report

Basis: The proposed revisions to the 2nd, 4th, 5th, 8th, 10th and 26th rows in Table 1 (Conditions 3, 7, 8, 9, 12, 17, and 21) are intended to more clearly documents the changes requested in the permit application.

We propose to revise the description of how Condition 21 was changed so that the description matches the outcome of what is contained in Condition 21, including removal of the footnote in that condition and stating the entire CPF-1 stationary source assessable PTE value.

Response: The Department revised several rows in Table 1 of the TAR as requested. The revisions more clearly document the changes requested in the application.

10. Section 1.3 Effect of Revisions

Requested Change: Correct the typographical error as shown in marked up Technical Analysis Report.

Response: The Department revised ‘operating’ to ‘operation’ as requested.

11. Section 1.5 Department Finding No.2

Requested Change: Revise as shown in marked up Technical Analysis Report.

Basis: The proposed revision clarifies that the SO2 PSD avoidance limit applies to the heaters authorized by this permit. It does not apply to the turbines. Also the PSD avoidance limits were established by Permit 267CPT02 (a predecessor to this permit), not in “past permit actions” which implies actions completed prior to the project authorized this permit and its predecessors.

The revision in the 3rd sentence corrects a typographical error.

Response: The Department revised the second bullet in the Department Findings. This permit did not authorize the production heaters. It lists them. The revisions clarify that the production heaters listed in this permit are subject to SO_2 PSD avoidance limit.

12. Section 2.1 General Requirement for all Minor Permits

Requested Change: Revise as shown in marked up Technical Analysis Report

Basis: Change the assessable PTE value presented in this section of the TAR to match the CPF-1 assessable PTE value stated in Condition 75.1 of the EPA draft CPF-1 Title V permit (5,309 tpy).

Response: *The Department revised the assessable PTE from '5,310 tpy' to '5,309 tpy' as requested.*

13. Section 3.0 Permit Administration

Requested Change: Revise as shown in marked up Technical Analysis Report

Basis: The proposed revision is intended to clarify the sentence to state what we believe is the intended allowance for operation of CPF-1 according to the provisions of this minor permit upon issuance.

Response: *The Department declines to add 'upon issuance' to the last sentence in Section 3.0 (Permit Administration). In fact, the last sentence in the draft Technical Analysis Report was an error. Since the active operating permit for the stationary source is still AQ0267TVP01 Revision 2 and AQ0267TVP01 Revision 2 contains drill rig conditions that Minor Permit AQ0267MSS06 has deleted, the Permittee cannot operate under Operating Permit AQ0267TVP01 Revision 2 and Minor Permit AQ0267MSS06 simultaneously.*

Therefore, the CPAI cannot operate under Minor Permit AQ0267MSS06 until the Department issues a renewal operating permit or a revised operating permit that contains the terms and provisions of Minor Permit AQ0267MSS06.

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Attachment G

Emissions Calculations
(enclosed electronically)

Attachment H

Modeling Files
(enclosed electronically)