ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Amendments to:

State Air Quality Control Plan

Volume III: Appendix III.K.13

2021 Alaska Regional Haze State Implementation Plan

Appendix to Section III.K.13.H

Public Notice Draft

March 30, 2022

Mike J. Dunleavy, Governor

Jason W. Brune, Commissioner

(This page serves as a placeholder for two-sided-copying)

Appendix III.K.13.H. Long-Term Strategy

Contents

Regional Haze Visibility Protection Area
Hank Nikkels and George Sullivan Plants

APPENDIX III.K.13.H REGIONAL HAZE VISIBILITY PROTECTION AREA

1. OVERVIEW

The Regional Haze Rule requires Alaska to submit a 10- to 15-year long-term strategy (LTS) to address regional haze visibility impairment in each Class I area in Alaska. To assist the state's efforts in establishing the LTS and to track and control current and potential new sources that may affect visibility in the Class I areas, ADEC is proposing to establish a Regional Haze Visibility Protection Area (VPA). Emitting sources within the VPA would be subject to reporting and permit application requirements to be set by the state.

VPA is proposed for Denali National Park and Preserve and Tuxedni National Wildlife Refuge Class I areas. There is no air monitoring being conducted for the Bering Sea Wilderness Area due to its remote location and its inaccessibility. VPA is not established for the Simenof Wilderness Area due to its remoteness and large visibility contributions from natural sources and commercial marine emissions that are being addressed through different measures.

This appendix describes methodology used to establish the VPA. The fundamental considerations of establishing VPA are that VPA must 1) capture transport of pollution impacting visibility at each Class I area; 2) address existing and new potential high impacting sources; 3) align with established jurisdictional boundaries. The first two fundamentals are addressed through an Area of Influence (AOI) and Weighted Emissions Potential (WEP) analysis as described in Section K.13.G.6 *Alaska Area of Influence (AOI) and Weighted Emissions Potential (WEP) analysis*.

2. ESTABLISHMENT OF VISIBILITY PROTECTION AREA BOUNDARY

The establishment of the VPA required four main steps that are summarized here and described in more detail below:

1. Define the subset of stationary point sources that affect visibility for the Class I area.

2. Select a jurisdictional boundary over which the VPA was to be defined that includes those sources.

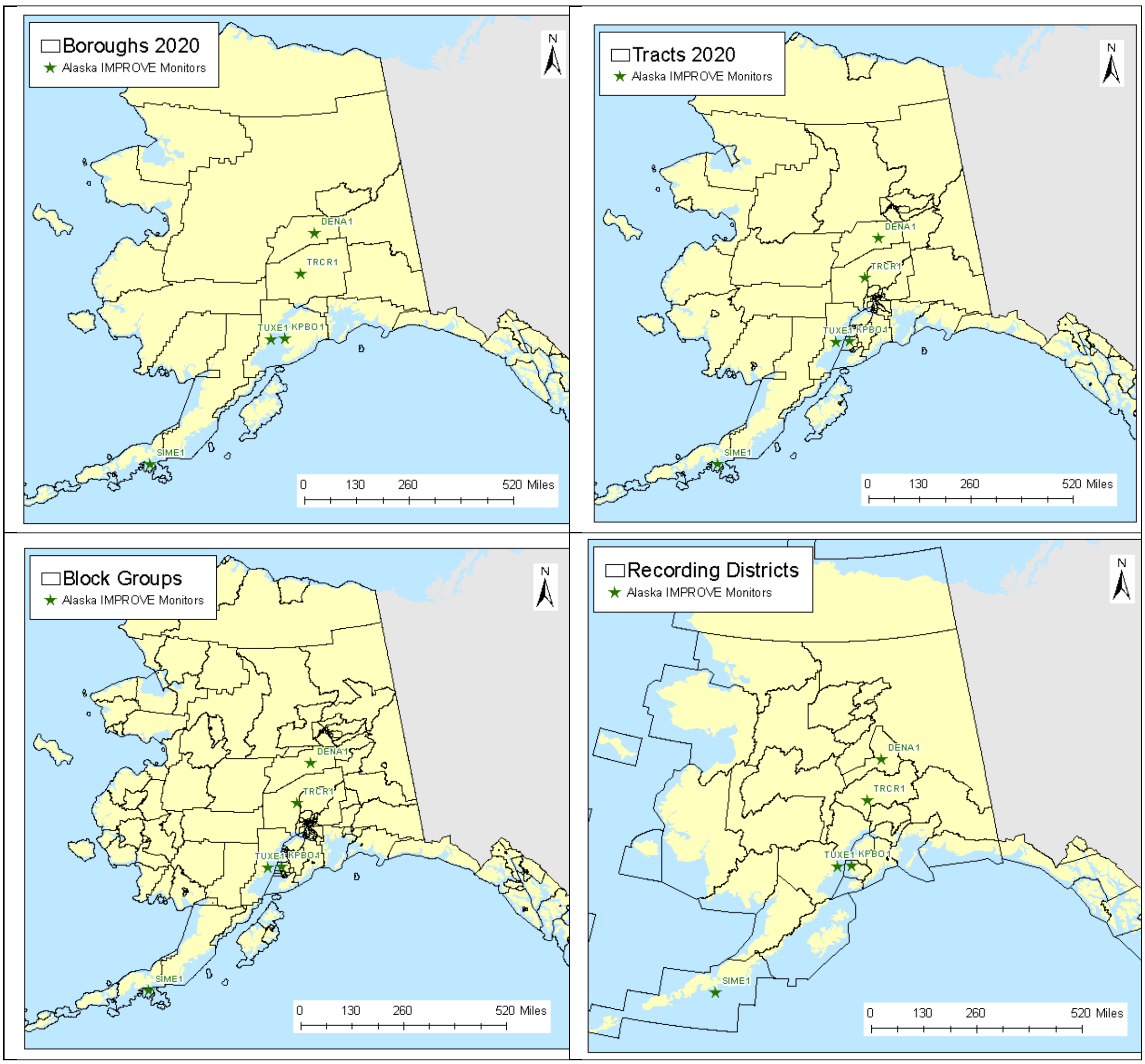
3. Determine the appropriate directionality and extent of the VPA for each Class I area. This was accomplished by analysis of the back-trajectory residence times (RT) analysis and WEP NO_x and SO_x analysis for the most impaired days (MID). NO_x and SO_x are the two main PM precursors from anthropogenic sources that contribute to visibility impairment at these locations.

4. Verify the defined VPA with respect to the current WEP for NO_x and SO_x to ensure that the VPA comprises the vast majority (e.g., more than 80 %) of current anthropogenic emissions that contribute to SO_4 and NO_3 impairment on the MID.

Jurisdiction boundaries selection

The preference for selecting the jurisdictional boundary type was to follow existing jurisdictional boundaries rather than establishing new boundaries. Four boundary types were considered as shown below in Figure 1. The top left panel displays the Alaskan boroughs which was the coarsest jurisdiction that was considered. The top right panel displays census tract boundaries that are a subdivision of the boroughs. The bottom left panel displays the block group jurisdictional boundary that is a subdivision of census tracts. The bottom right panel displays recording districts which are a different type of jurisdiction unrelated to the other three. The most refined jurisdictional boundary type is the block group which was selected as the jurisdictional boundary type for the VPA since it enables the most precise coverage of areas (i.e., the highest visibility impacting areas will be covered while simultaneously excluding areas with negligible visibility impacts).

Figure 1-. Jurisdictional boundary types in Alaska.



Residence Time and WEP Screening

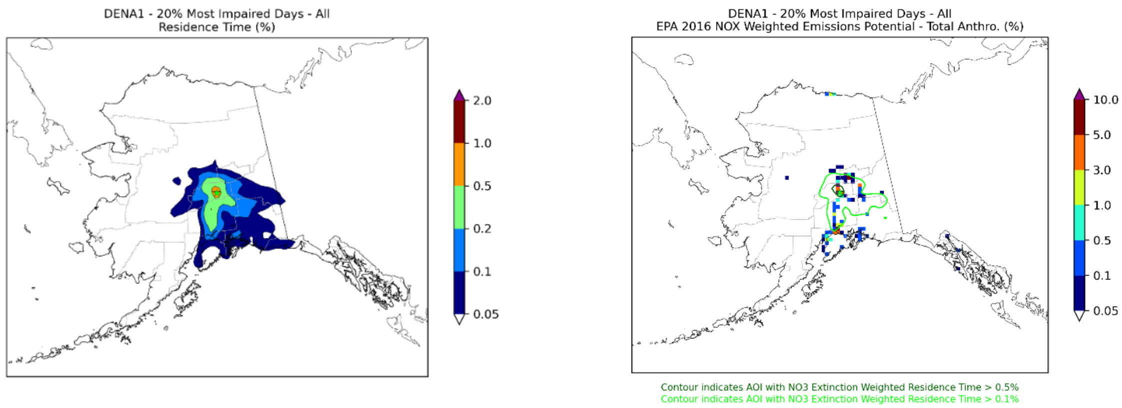
Knowledge of which geographic source regions have a high probability of contributing to anthropogenic visibility impairment at Class I areas on the MID in Alaska is critical to determine appropriate VPA coverage. The RT and WEP analyses identify, respectively, the locations and current anthropogenic sources of emissions within and nearby the state that had the potential to contribute the most to visibility impairment on the IMPROVE MID, thus are used here to form the basis of the VPA determination.

The two metrics used to determine the VPA are:

(1) **Residence Time (RT),** where the RT is the cumulative time that back trajectories reside in a specific geographical area and is normalized to display percentage of total trajectory time. An example is shown in the left panel of Figure 2. Note that the RT analysis was based on a 5-year current period (e.g., 2014-2018 for Denali) and was performed for all the MID over those 5-years to capture various meteorological conditions including those that may not occur every year. The RT analysis was based on the aggregated results for back-trajectories initiated at multiple heights above the ground (100 meter (m), 200 m, 500 m, and 1,000 m).

(2) **Weighted Emissions Potential (WEP**), where the WEP determines the potential impacts from sources by combing the extinction weighted residence time (EWRT) values with emissions (Q) from sources. Note that EWRT is the RT multiplied by the extinction coefficient attributed to the pollutant ((e.g., ammonium sulfate or ammonium nitrate) measured upon arrival at the IMPROVE site on the day that matches the day of the trajectory. To incorporate the dilution effects of dispersion, deposition and chemical transformation along the path of the trajectories, emissions were inversely weighted by the distance (*d*) between the centers of the grid cell emitting the emissions and the grid cell containing the IMPROVE site. An example of a WEP plot is shown in the right panel of Figure 0-2.

Figure 2-. Example of Residence Time (RT) analysis and weighted emissions potential (WEP) analysis for Denali.

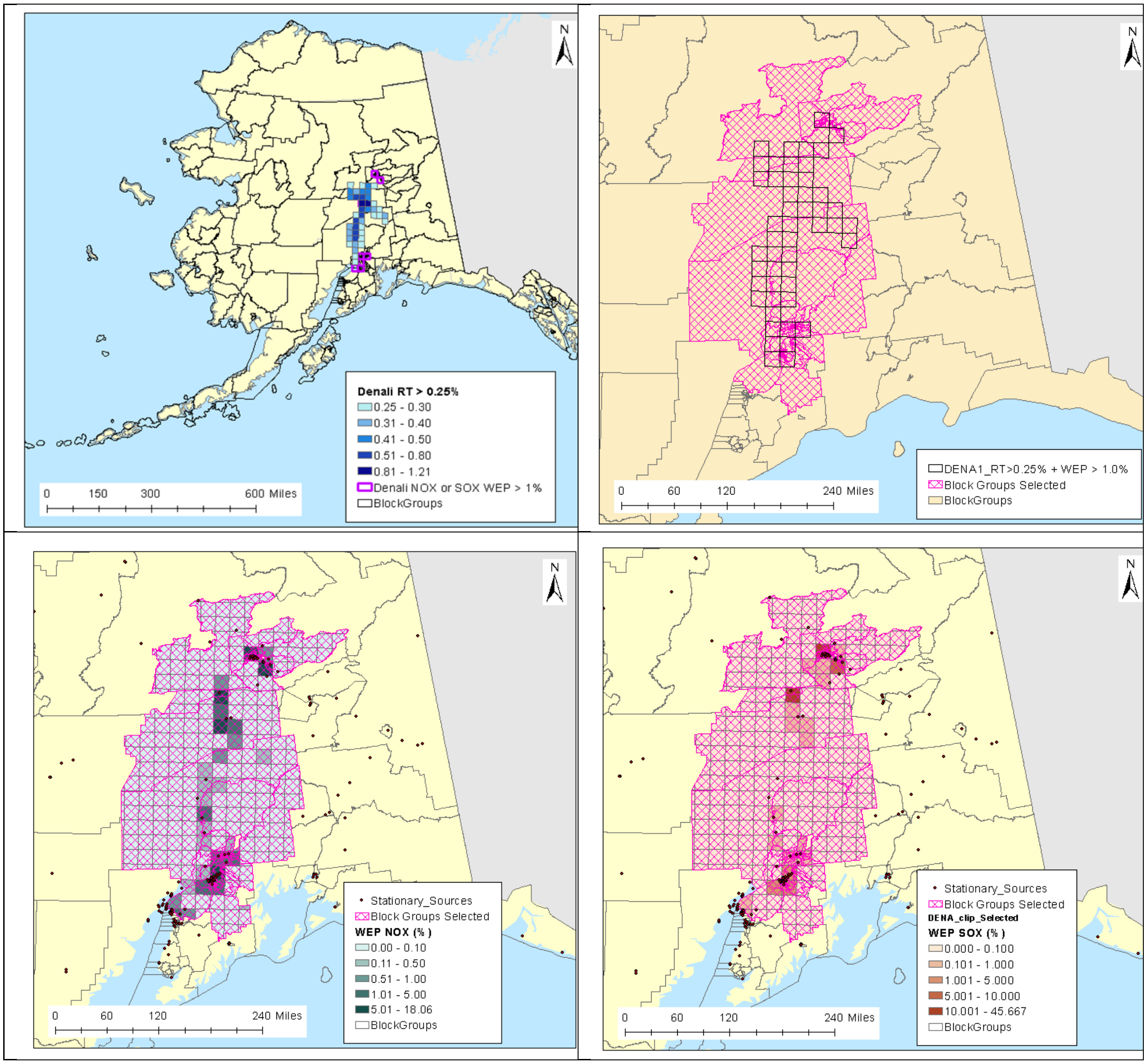


The VPA is required to satisfy a set of criteria thresholds for RT and WEP. The jurisdictional boundaries with grid cells above these thresholds are selected and included in the candidate VPA. Finally, the VPA needs to meet the minimum requirement of 80% of total WEP NO_x and SO_x. This process was performed multiple times with different RT thresholds including 0.1 %, 0.2 %, and 0.25 % and different jurisdictional boundaries. With the lower thresholds (and coarse boundaries) much of the state of Alaska was selected by this methodology including regions far from the IMPROVE monitor and with negligible contributing emissions. The 0.25 % RT threshold (with block group boundaries) captured a reasonable area coverage, and the addition of a WEP criteria threshold of WEP NO_x or SO_x of more than 1.0 % for any grid cells contiguous to the selected RT of more than 0.25 % grid cells ensured coverage of sources with high potential to contribute to visibility impairment. The final criteria were:

- Jurisdictional boundaries = Block Groups
- RT criteria threshold = 0.25 %
- WEP criteria threshold = 1.0% for WEP NOx or WEP SOx (for grid cells contiguous to the selected RT grid cells)

Figure 3 graphically presents the results of grid cell selection after applying the RT and WEP threshold (the upper left panel), the intersected jurisdictions (the upper right panel), and the resulting VPA with WEP NO_x and SO_x in the lower left and right panels, respectively, presenting Denali as an example of the methodology.

Figure 3-. Illustration of the VPA definition methodology using the Denali location as an example.



Results

Figures 4 to 7 present the VPA boundaries and NO_x and SO_x WEP emissions for the Denali Headquarters site (DENA1), the Trapper Creek Site in Denali National Park and Preserve (TRCR1), the Tuxedni National Wildlife Refuge (TUXE1) and the Simeonof Wilderness Area (SIME1), respectively. For all IMPROVE sites except SIME1, the VPA covers more than 80 % of the NO_x and SO_x WEP for that site (Table 1). The SIME1 VPA only covers 13 % of the SO_x WEP and 69% of the NO_x WEP. Most of the WEP SO_x for SIME are from emissions over the water that are not included in the emissions sum over the block group since the block jurisdictions do not extend very far into the ocean. In addition, the dominant anthropogenic emissions in this region are from Commercial Marine Vessels (CMV) that are regulated separately from this proposed effort. For these reasons, Simenonof Wilderness Area is omitted from the proposed VPA. (Figure 8)

Table 1. Summary of NO_x and SO_x WEP percentage contained the VPA defined for each IMPROVE monitor.

IMPROVE site	Sum WEP	
	NO_x (%)	SO_2 (%)
Denali Headquarters site (DENA1)	88	95
Trapper Creek Site in Denali National Park and Preserve (TRCR1)	95	84
Tuxedni National Wildlife Refuge (TUXE1)	90	87
Simeonof Wilderness Area (SIME1)	69	13

Figure 4-. SO_x and NO_x WEP within the VPA for Denali Headquarters Site (DENA1)

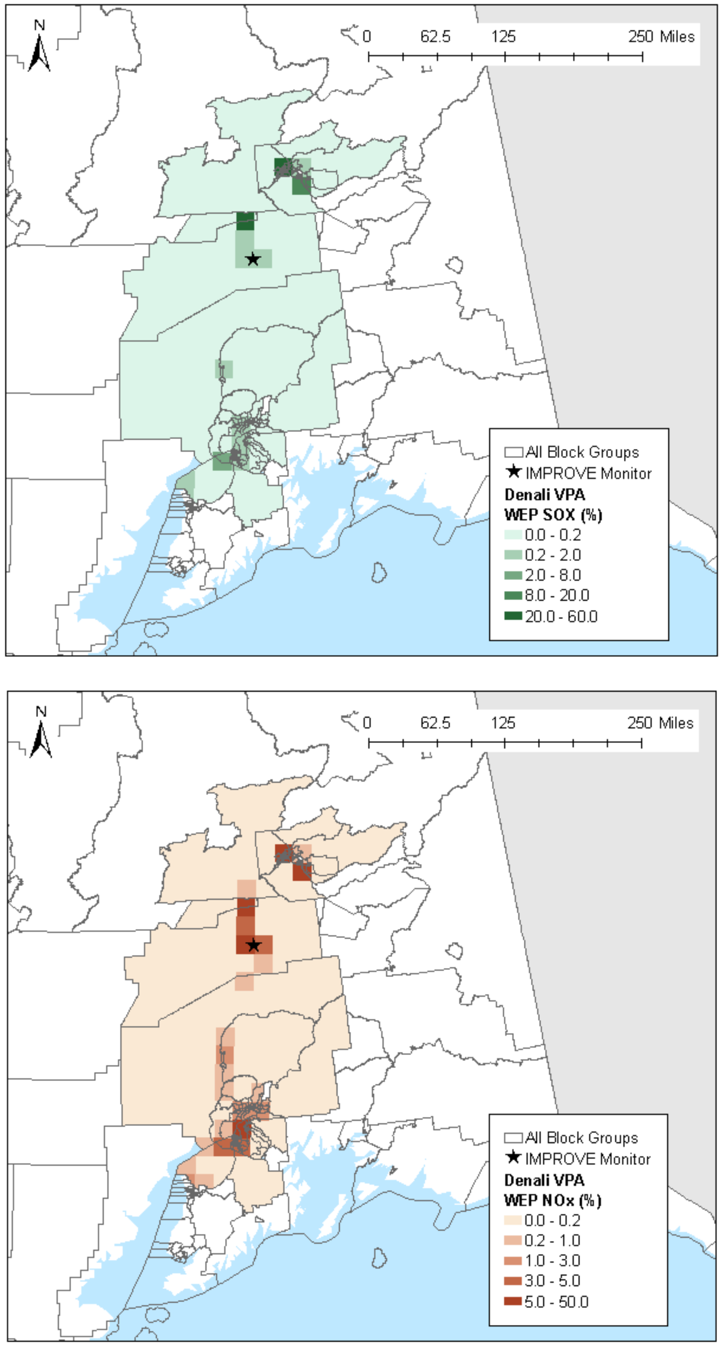
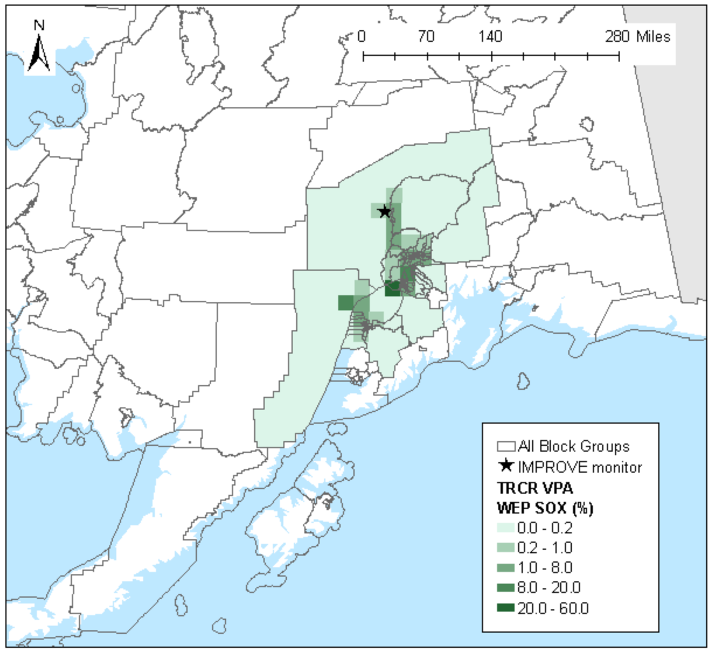


Figure 5-. SO_x and NO_x WEP within the VPA for Trapper Creek Site in Denali National Park and Preserve (TRCR1)



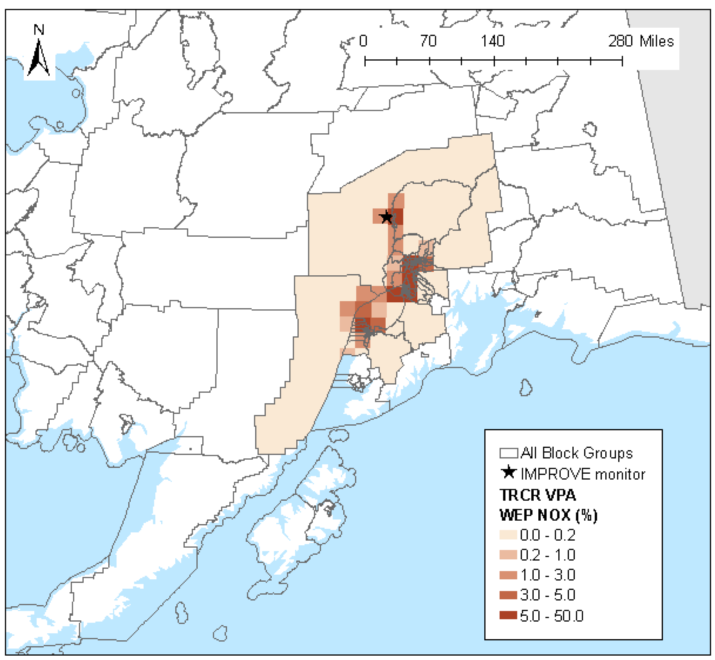
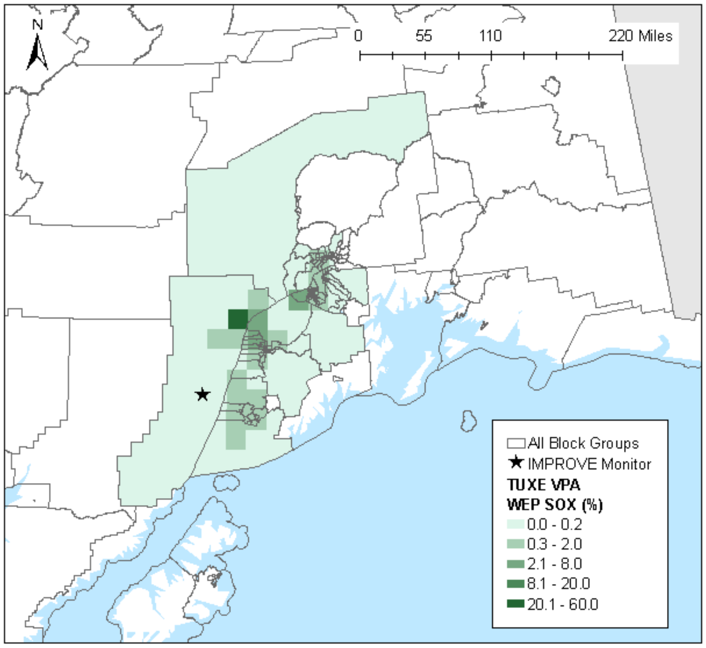


Figure 6-. SO_x and NO_x WEP within the VPA for Tuxedni National Wildlife Refuge (TUXE1)



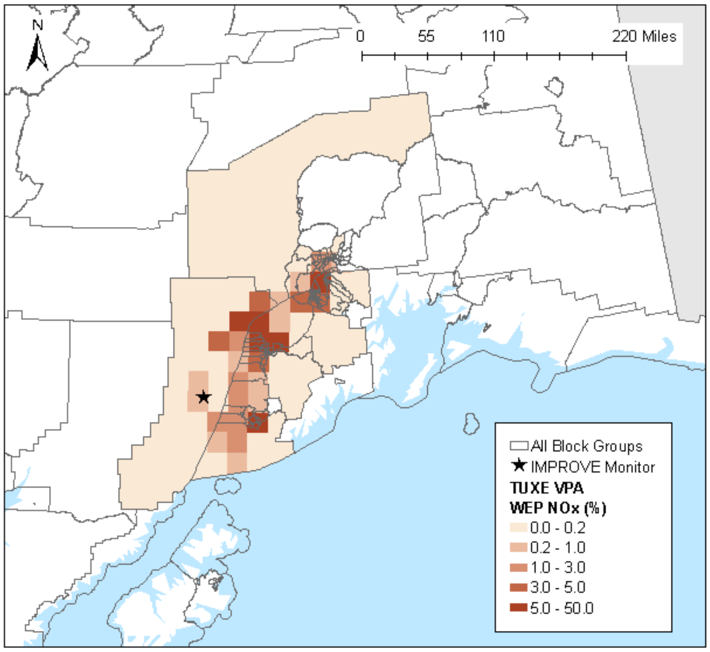
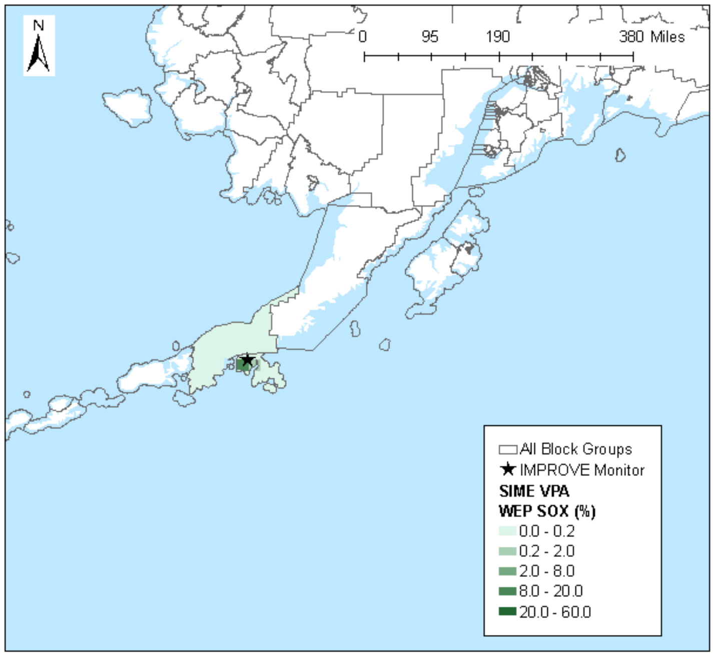


Figure 7-. SO_x and NO_x WEP within the VPA for Simeonof Wilderness Area (SIME1)



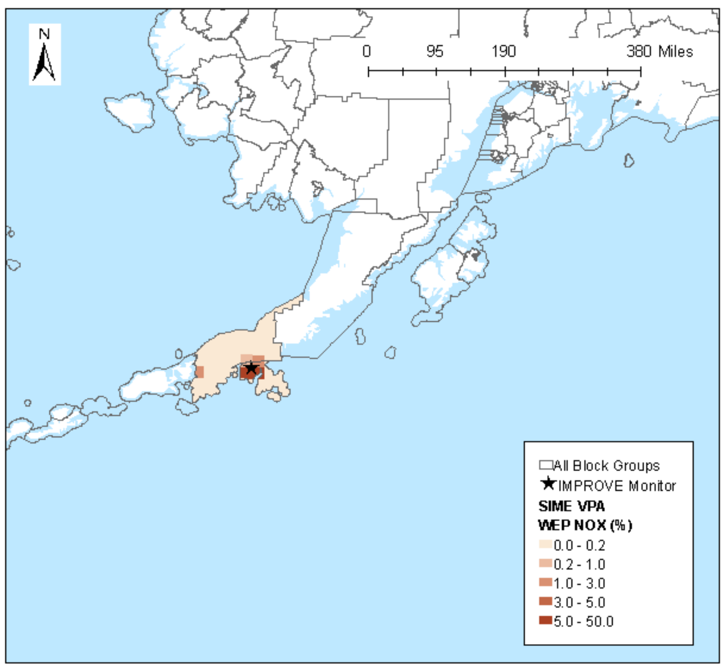
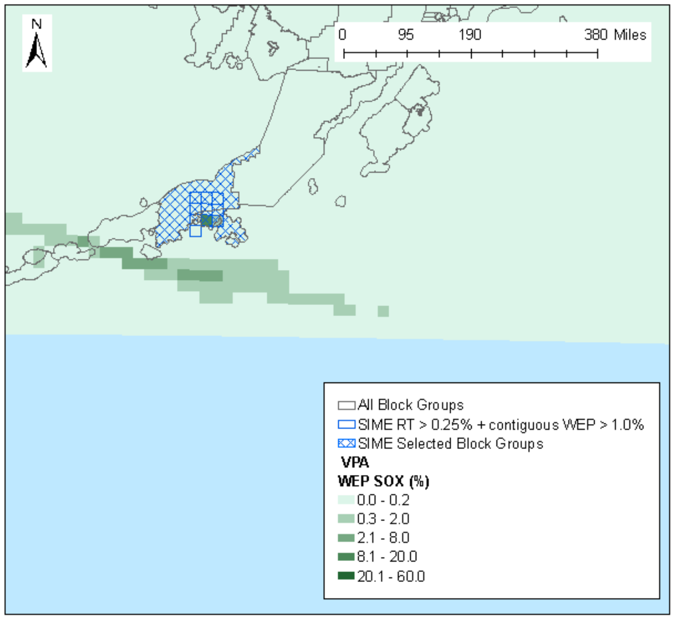


Figure 8-. Simeonof detail showing WEP SO_x emissions outside of the VPA boundary that was developed following the methodology



3. CONCLUSIONS

A visibility protection area has been defined based on prior analysis of the atmospheric transport patterns to the IMPROVE monitors in Denali National Park and Preserve and the Tuxedni National Wildlife Refuge. Figure 9 shows the extent of the combined VPA boundaries from the three IMPROVE sites at the two Class I areas. The proposed VPA covers a minimum of 84% of the current SO_x WEP and 88% of the current NO_x WEP for each individually defined VPA and the combined VPA will have even higher percentile coverage. In addition, since the method is primarily based on prevailing transport patterns irrespective of the location of current emission sources, regions that could potentially impact the IMPROVE monitors in the future due to being frequently upwind of the monitor are also included in the VPA. This method is robust at addressing both current and potential future source contributions to visibility impacts at the two Class I areas. (Figure 10)

Figure 9-. Proposed VPA boundaries

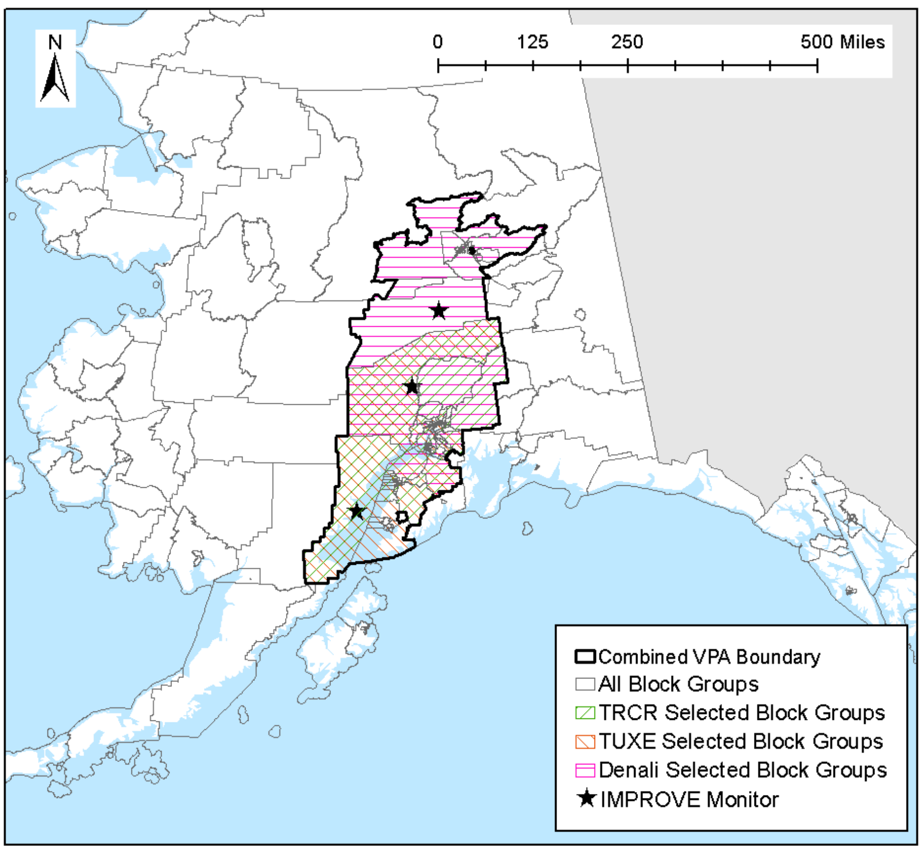
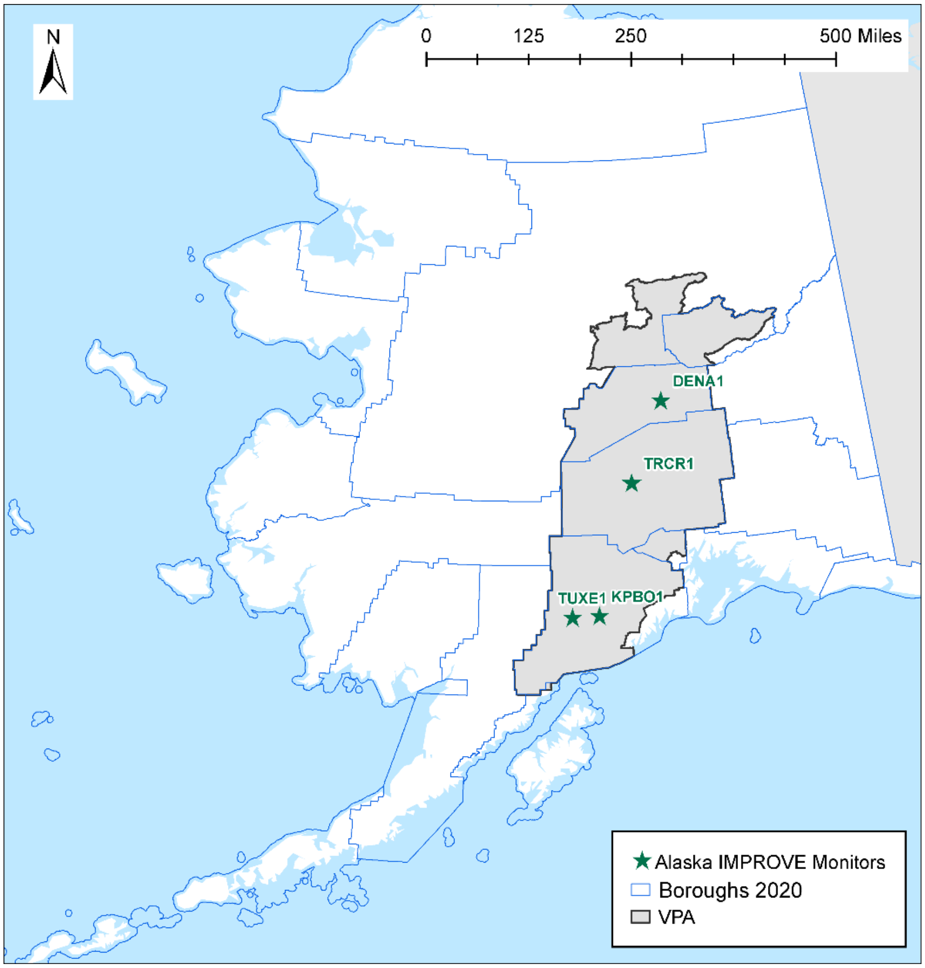


Figure 10. Proposed VPA boundaries final graphic



MUNICIPAL
LIGHT & POWER

March 7, 2017

ATTN: Assessable Emissions Estimate
Air Permits Program
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Re: **FY 2018 Assessable Emissions – Anchorage Municipal Light and Power Facilities**

Dear Sir or Madame:

In accordance with 18 AAC 50.410 (b)(1), Anchorage Municipal Light and Power (ML&P) submits the attached projected fiscal year (FY) 2018 assessable emissions for Generation Plant One and Generation Plant Two. The projected emissions are tabulated in Attachments 1 and 2, and are based on each facility's actual operation during calendar year 2016. Each attachment includes documentation of all relevant operational data and pollutant-by-pollutant emission calculations for completeness.

It is our understanding that the Department will invoice ML&P based on the total assessable emissions indicated in the emissions summary table shown on the first page of each attachment. Please contact Yelena Saville at (907) 263-5273 if you have questions or require additional information regarding these FY 2017 assessable emissions estimates.

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.

Mark A. Johnston
General Manager

Attachments:

1. Generation Plant One Projected FY 2018 Assessable Emissions
2. Generation Plant Two Projected FY 2018 Assessable Emissions

1200 East First Avenue • Anchorage, Alaska • 99501-1685
Phone 907.263-5273 • Fax 907.263.5862
www.mlandp.com

Attachment 1

Anchorage Municipal Light and Power FY 2018 Assessable Emissions

Generation Plant One

Summary of Projected FY 2018 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant One

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	PM2.5	VOC	SO_2
Regulated Significant	29.5	12.9	1.8	1.8	0.57	0.03
Regulated Insignificant	3.5	1.5	0.2	0.2	0.2	0.1
Subtotals	33.0	14.4	2.0	2.0	0.77	0.13
Fees Apply to Pollutant?	Yes	Yes	No	No	No	No
Total Emissions (tons)	**47**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2016.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2018 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2016)
Generation Plant One

No.	Emitting Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2016 Operation	Emission Rate
1	GTG-1 Gas Turbine Generator #1	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	225 MMBtu/hr	0.8 MMscf/yr	0.0000 tpy
1a	GTG-1 Gas Turbine Generator #1	Mass Balance	0.1 wt% S	0.014 lb/gal	225 MMBtu/hr	163 gal/yr	0.0011 tpy
2	GTG-2 Gas Turbine Generator #2	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	225 MMBtu/hr	1.2 MMscf/yr	0.00002 tpy
2a	GTG-2 Gas Turbine Generator #2	Mass Balance	0.1 wt% S	0.014 lb/gal	225 MMBtu/hr	785 gal/yr	0.0055 tpy
3a	GTG-3 Gas Turbine Generator #3	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	292 MMBtu/hr	442.7 MMscf/yr	0.0075 tpy
10	GTG-3 Air Preheater	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	4.44 MMBtu/hr	0.9 MMscf/yr	0.0000 tpy
4	GTG-4 Gas Turbine Generator #4	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	420 MMBtu/hr	93.7 MMscf/yr	0.0016 tpy
4a	GTG-4 Gas Turbine Generator #4	Mass Balance	0.1 wt% S	0.014 lb/gal	420 MMBtu/hr	2,554 gal/yr	0.0179 tpy
11	Cummins Black Start Engine	Mass Balance	0.0015 wt% S	0.000 lb/gal	12.3 MMBtu/hr	582 gal/yr	0.0001 tpy
		Total Emissions from Regulated Significant Units					**0.03 tpy**

Notes:
- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S content

Attachment 2

Anchorage Municipal Light and Power FY 2018 Assessable Emissions

Generation Plant Two

Summary of Projected FY 2018 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant Two

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	$PM_{2.5}$	VOC	SO_2
Regulated Significant	1,031	278	21.3	21.3	6.8	0.16
Regulated Insignificant	2.0	1.0	0.5	0.5	0.4	0.10
Subtotals	1,033	279	21.8	21.8	7.2	0.26
Fees Apply to Pollutant?	Yes	Yes	Yes	Yes	No	No
Total Assessable Emissions (tons)	**1355**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2016.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2018 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2016)
Generation Plant Two

No.	Emitting Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2016 Operation	Emission Rate
1	Westinghouse W-251-B2 (Unit# 5)	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	480 MMBtu/hr	7.6 MMscf/yr	0.00 tpy
1a	Westinghouse W-251-B2 (Unit# 5)	Mass Balance	0.1 wt% S	0.014 lb/gal	480 MMBtu/hr	2,100 gal/yr	0.01 tpy
2	General Electric Frame 7 - PG7981 (Unit# 7)	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,093 MMBtu/hr	5,918.0 MMscf/yr	0.10 tpy
2a	General Electric Frame 7 - PG7981 (Unit# 7)	Mass Balance	0.1 wt% S	0.014 lb/gal	1,093 MMBtu/hr	5,460 gal/yr	0.04 tpy
3	General Electric Frame 7 - PG7111 (Unit# 8)	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,136 MMBtu/hr	516.5 MMscf/yr	0.01 tpy
3a	General Electric Frame 7 - PG7111 (Unit# 8)	Mass Balance	0.1 wt% S	0.014 lb/gal	1,136 MMBtu/hr	0 gal/yr	0.00 tpy
5	Cummins Engine (Unit #5 Blackstart)	Mass Balance	0.1 wt% S	0.014 lb/gal	750 hp	77 gal/yr	0.001 tpy
		Total Emissions from Regulated Significant Units					**0.16 tpy**

Notes:

- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S concentration.

MUNICIPAL
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March 2, 2018

ATTN: Assessable Emissions Estimate
Air Permits Program
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Re: **FY 2019 Assessable Emissions – Anchorage Municipal Light and Power Facilities**

Dear Sir or Madame:

In accordance with 18 AAC 50.410 (b)(1), Anchorage Municipal Light and Power (ML&P) submits the attached projected fiscal year (FY) 2019 assessable emissions for Generation Plant One and Generation Plant Two. The projected emissions are tabulated in Attachments 1 and 2, and are based on each facility's actual operation during calendar year 2017. Each attachment includes documentation of all relevant operational data and pollutant-by-pollutant emission calculations for completeness.

It is our understanding that the Department will invoice ML&P based on the total assessable emissions indicated in the emissions summary table shown on the first page of each attachment. Please contact Yelena Saville at (907) 263-5273 if you have questions or require additional information regarding these FY 2019 assessable emissions estimates.

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.

Mark A. Johnston
General Manager

Attachments:

1. Generation Plant One Projected FY 2019 Assessable Emissions
2. Generation Plant Two Projected FY 2019 Assessable Emissions

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Phone 907.263-5273 • Fax 907.263.5862
www.mlandp.com

Attachment 1

Anchorage Municipal Light and Power FY 2019 Assessable Emissions

Generation Plant One

Summary of Projected FY 2019 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant One

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	PM2.5	VOC	SO_2
Regulated Significant	36.5	16.5	2.1	2.1	0.69	0.06
Regulated Insignificant	3.5	1.5	0.2	0.2	0.2	0.1
Subtotals	40.0	18.0	2.3	2.3	0.89	0.16
Fees Apply to Pollutant?	Yes	Yes	No	No	No	No
Total Emissions (tons)	**58**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2017.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2019 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2017)
Generation Plant One

No.	Emitting Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2017 Operation	Emission Rate
1	GTG-1 Gas Turbine Generator #1	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	225 MMBtu/hr	0.0 MMscf/yr	0.0000 tpy
1a	GTG-1 Gas Turbine Generator #1	Mass Balance	0.1 wt% S	0.014 lb/gal	225 MMBtu/hr	0 gal/yr	0.0000 tpy
2	GTG-2 Gas Turbine Generator #2	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	225 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
2a	GTG-2 Gas Turbine Generator #2	Mass Balance	0.1 wt% S	0.014 lb/gal	225 MMBtu/hr	0 gal/yr	0.0000 tpy
3a	GTG-3 Gas Turbine Generator #3	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	292 MMBtu/hr	549.0 MMscf/yr	0.0093 tpy
10	GTG-3 Air Preheater	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	4.44 MMBtu/hr	1.7 MMscf/yr	0.0000 tpy
4	GTG-4 Gas Turbine Generator #4	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	420 MMBtu/hr	96.0 MMscf/yr	0.0016 tpy
4a	GTG-4 Gas Turbine Generator #4	Mass Balance	0.1 wt% S	0.014 lb/gal	420 MMBtu/hr	6,838 gal/yr	0.0479 tpy
11	Cummins Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	12.3 MMBtu/hr	927 gal/yr	0.0001 tpy
		Total Emissions from Regulated Significant Units					**0.06 tpy**

Notes:

- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S content

Attachment 2

Anchorage Municipal Light and Power FY 2019 Assessable Emissions

Generation Plant Two

Summary of Projected FY 2019 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant Two

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	$PM_{2.5}$	VOC	SO_2
Regulated Significant	272	99	17.8	16.7	9.5	0.15
Regulated Insignificant	2.0	1.0	0.5	0.5	0.4	0.10
Subtotals	274	100	18.3	17.2	9.9	0.25
Fees Apply to Pollutant?	Yes	Yes	Yes	Yes	No	No
Total Assessable Emissions (tons)	**409**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2017.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2019 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2017)
Generation Plant Two

EU ID	Emitting Unit Name	Emis. Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2017 Operation	Emission Rate
1	GTG-5 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	480 MMBtu/hr	0.0 MMscf/yr	0.000 tpy
1	GTG-5 Gas Turbine Generator	Mass Balance	0.1 wt% S	0.014 lb/gal	480 MMBtu/hr	0 gal/yr	0.000 tpy
2	GTG-7 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,093 MMBtu/hr	1,481.4 MMscf/yr	0.025 tpy
2	GTG-7 Gas Turbine Generator	Mass Balance	0.1 wt% S	0.014 lb/gal	1,093 MMBtu/hr	4,746 gal/yr	0.033 tpy
3	GTG-8 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,136 MMBtu/hr	43.7 MMscf/yr	0.001 tpy
5	Cummins Engine (GTG-5 staring motor)	Mass Balance	0.0015 wt% S	0.000 lb/gal	750 Hp	0 gal/yr	0.000 tpy
6	GTG-9 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	408 MMBtu/hr	2,841 MMscf/yr	0.048 tpy
7	GTG-10 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	408 MMBtu/hr	2,727 MMscf/yr	0.046 tpy
9	Plant 2A Caterpillar Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	3,680 Hp	2,082 gal/yr	0.0002 tpy
10	John Deere GTG-5 Black Start Engine	AP-42, Table 3.4-1	0.0015 wt% S	0.000012 lb/Hp-hr	303 Hp	12 hrs	0.00002 tpy
11	GTG-6 Auxillary Engine	AP-42, Table 3.4-1	0.0015 wt% S	0.000012 lb/Hp-hr	134 Hp	12 hrs	0.00001 tpy
		Total Emissions from Regulated Significant Units					**0.15 tpy**

Notes:

- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S concentration.

MUNICIPAL
LIGHT & POWER

February 15, 2019

ATTN: Assessable Emissions Estimate
Air Permits Program
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Re: **FY 2020 Assessable Emissions – Anchorage Municipal Light and Power Facilities**

Dear Sir or Madame:

In accordance with 18 AAC 50.410 (b)(1), Anchorage Municipal Light and Power (ML&P) submits the attached projected fiscal year (FY) 2020 assessable emissions for Generation Plant One and Generation Plant Two. The projected emissions are tabulated in Attachments 1 and 2, and are based on each facility's actual operation during calendar year 2018. Each attachment includes documentation of all relevant operational data and pollutant-by-pollutant emission calculations for completeness.

It is our understanding that the Department will invoice ML&P based on the total assessable emissions indicated in the emissions summary table shown on the first page of each attachment. Please contact Yelena Saville at (907) 263-5273 if you have questions or require additional information regarding these FY 2020 assessable emissions estimates.

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.

Mark A. Johnston
General Manager

Attachments:

1. Generation Plant One Projected FY 2020 Assessable Emissions
2. Generation Plant Two Projected FY 2020 Assessable Emissions

1200 East First Avenue • Anchorage, Alaska • 99501-1685
Phone 907.263-5273 • Fax 907.263.5862
www.mlandp.com

Attachment 1

Anchorage Municipal Light and Power FY 2020
Assessable Emissions

Generation Plant One

Summary of Projected FY 2020 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant One

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	PM2.5	VOC	SO_2
Regulated Significant	33.7	14.6	1.3	1.3	0.42	0.05
Regulated Insignificant	3.5	1.5	0.2	0.2	0.2	0.1
Subtotals	37.2	16.1	1.5	1.5	0.62	0.15
Fees Apply to Pollutant?	Yes	Yes	No	No	No	No
Total Emissions (tons)	**53**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2018.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2020 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2018)
Generation Plant One

No.	Emitting Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2018 Operation	Emission Rate
1	GTG-1 Gas Turbine Generator #1	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	225 MMBtu/hr	0.0 MMscf/yr	0.0000 tpy
1a	GTG-1 Gas Turbine Generator #1	Mass Balance	0.1 wt% S	0.014 lb/gal	225 MMBtu/hr	0 gal/yr	0.0000 tpy
2	GTG-2 Gas Turbine Generator #2	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	225 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
2a	GTG-2 Gas Turbine Generator #2	Mass Balance	0.1 wt% S	0.014 lb/gal	225 MMBtu/hr	0 gal/yr	0.0000 tpy
3a	GTG-3 Gas Turbine Generator #3	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	292 MMBtu/hr	234.5 MMscf/yr	0.0040 tpy
10	GTG-3 Air Preheater	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	4.44 MMBtu/hr	0.7 MMscf/yr	0.0000 tpy
4	GTG-4 Gas Turbine Generator #4	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	420 MMBtu/hr	157.1 MMscf/yr	0.0027 tpy
4a	GTG-4 Gas Turbine Generator #4	Mass Balance	0.1 wt% S	0.014 lb/gal	420 MMBtu/hr	6,065 gal/yr	0.0425 tpy
11	Cummins Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	12.3 MMBtu/hr	832 gal/yr	0.0001 tpy
		Total Emissions from Regulated Significant Units					**0.05 tpy**

Notes:
- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S content

Attachment 2

Anchorage Municipal Light and Power FY 2020 Assessable Emissions

Generation Plant Two

Summary of Projected FY 2020 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant Two

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	$PM_{2.5}$	VOC	SO_2
Regulated Significant	173	73	17.2	16.0	9.7	0.14
Regulated Insignificant	2.0	1.0	0.5	0.5	0.4	0.10
Subtotals	175	74	17.7	16.5	10.1	0.24
Fees Apply to Pollutant?	Yes	Yes	Yes	Yes	Yes	No
Total Assessable Emissions (tons)	**293**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2018.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2020 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2018)
Generation Plant Two

EU ID	Emitting Unit Name	Emis. Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2018 Operation	Emission Rate
1	GTG-5 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	480 MMBtu/hr	0.0 MMscf/yr	0.000 tpy
1	GTG-5 Gas Turbine Generator	Mass Balance	0.1 wt% S	0.014 lb/gal	480 MMBtu/hr	0 gal/yr	0.000 tpy
2	GTG-7 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,093 MMBtu/hr	886.1 MMscf/yr	0.015 tpy
2	GTG-7 Gas Turbine Generator	Mass Balance	0.1 wt% S	0.014 lb/gal	1,093 MMBtu/hr	2,478 gal/yr	0.017 tpy
3	GTG-8 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,136 MMBtu/hr	16.5 MMscf/yr	0.000 tpy
5	Cummins Engine (GTG-5 staring motor)	Mass Balance	0.0015 wt% S	0.000 lb/gal	750 Hp	0 gal/yr	0.000 tpy
6	GTG-9 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	408 MMBtu/hr	3,071 MMscf/yr	0.052 tpy
7	GTG-10 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	408 MMBtu/hr	3,102 MMscf/yr	0.052 tpy
9	Plant 2A Caterpillar Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	3,680 Hp	3 gal/yr	0.0000 tpy
10	John Deere GTG-5 Black Start Engine	AP-42, Table 3.4-1	0.0015 wt% S	0.000012 lb/Hp-hr	303 Hp	0 hrs	0.00000 tpy
11	GTG-6 Auxillary Engine	AP-42, Table 3.4-1	0.0015 wt% S	0.000012 lb/Hp-hr	134 Hp	0 hrs	0.00000 tpy
		Total Emissions from Regulated Significant Units					**0.14 tpy**

Notes:
- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S concentration.

MUNICIPAL
LIGHT & POWER

February 14, 2020

ATTN: Assessable Emissions Estimate
Air Permits Program
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Re: **FY 2021 Assessable Emissions – Anchorage Municipal Light and Power Facilities**

Dear Sir or Madame:

In accordance with 18 AAC 50.410 (b)(1), Anchorage Municipal Light and Power (ML&P) submits the attached projected fiscal year (FY) 2021 assessable emissions for Generation Plant One and Generation Plant Two. The projected emissions are tabulated in Attachments 1 and 2, and are based on each facility's actual operation during calendar year 2019. Each attachment includes documentation of all relevant operational data and pollutant-by-pollutant emission calculations for completeness.

It is our understanding that the Department will invoice ML&P based on the total assessable emissions indicated in the emissions summary table shown on the first page of each attachment. Please contact Yelena Saville at (907) 263-5273 if you have questions or require additional information regarding these FY 2021 assessable emissions estimates.

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.

Anna Henderson

Anna Henderson
General Manager

Attachments:

1. Generation Plant One Projected FY 2021 Assessable Emissions
2. Generation Plant Two Projected FY 2021 Assessable Emissions

1200 East First Avenue • Anchorage, Alaska • 99501-1685
Phone 907.263-5273 • Fax 907.263.5862
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Attachment 1

Anchorage Municipal Light and Power FY 2021 Assessable Emissions

Generation Plant One

Summary of Projected FY 2021 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant One

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	PM2.5	VOC	SO_2
Regulated Significant	13.7	6.6	0.8	0.8	0.24	0.05
Regulated Insignificant	3.5	1.5	0.2	0.2	0.2	0.1
Subtotals	17.2	8.1	1.0	1.0	0.44	0.15
Fees Apply to Pollutant?	Yes	No	No	No	No	No
Total Emissions (tons)	**17**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2019.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2021 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2019)
Generation Plant One

No.	Emitting Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2019 Operation	Emission Rate
3a	GTG-3 Gas Turbine Generator #3	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	292 MMBtu/hr	181.3 MMscf/yr	0.0031 tpy
10	GTG-3 Air Preheater	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	4.44 MMBtu/hr	0.5 MMscf/yr	0.0000 tpy
4	GTG-4 Gas Turbine Generator #4	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	420 MMBtu/hr	43.7 MMscf/yr	0.0007 tpy
4a	GTG-4 Gas Turbine Generator #4	Mass Balance	0.1 wt% S	0.014 lb/gal	420 MMBtu/hr	6,008 gal/yr	0.0421 tpy
11	Cummins Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	12.3 MMBtu/hr	668 gal/yr	0.0001 tpy
		Total Emissions from Regulated Significant Units					**0.05 tpy**

Notes:
- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S content

Attachment 2

Anchorage Municipal Light and Power FY 2021
Assessable Emissions

Generation Plant Two

Summary of Projected FY 2021 Assessable Emissions
Anchorage Municipal Light and Power
Generation Plant Two

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	$PM_{2.5}$	VOC	SO_2
Regulated Significant	81	27	15.4	14.2	9.1	0.09
Regulated Insignificant	2.0	1.0	0.5	0.5	0.2	0.00
Subtotals	83	28	15.9	14.7	9.3	0.09
Fees Apply to Pollutant?	Yes	Yes	Yes	Yes	No	No
Total Assessable Emissions (tons)	**142**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2019.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2021 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2019)
Generation Plant Two

EU ID	Emitting Unit Name	Emis. Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2019 Operation	Emission Rate
1	GTG-5 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	480 MMBtu/hr	0.0 MMscf/yr	0.000 tpy
1	GTG-5 Gas Turbine Generator	Mass Balance	0.1 wt% S	0.014 lb/gal	480 MMBtu/hr	0 gal/yr	0.000 tpy
2	GTG-7 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,093 MMBtu/hr	346.6 MMscf/yr	0.006 tpy
2	GTG-7 Gas Turbine Generator	Mass Balance	0.1 wt% S	0.014 lb/gal	1,093 MMBtu/hr	42 gal/yr	0.000 tpy
3	GTG-8 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,136 MMBtu/hr	11.7 MMscf/yr	0.000 tpy
5	Cummins Engine (GTG-5 staring motor)	Mass Balance	0.0015 wt% S	0.000 lb/gal	750 Hp	0 gal/yr	0.000 tpy
6	GTG-9 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	430 MMBtu/hr	2,375 MMscf/yr	0.040 tpy
7	GTG-10 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	430 MMBtu/hr	2,642 MMscf/yr	0.045 tpy
9	Plant 2A Caterpillar Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	3,680 Hp	2,082 gal/yr	0.0002 tpy
10	John Deere GTG-5 Black Start Engine	AP-42, Table 3.4-1	0.0015 wt% S	0.000012 lb/Hp-hr	303 Hp	0 hrs	0.00000 tpy
11	GTG-6 Auxillary Engine	AP-42, Table 3.4-1	0.0015 wt% S	0.000012 lb/Hp-hr	134 Hp	0 hrs	0.00000 tpy
		Total Emissions from Regulated Significant Units					**0.09 tpy**

Notes:

- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S concentration.

CHUGACH
POWERING ALASKA'S FUTURE

February 19, 2021

ATTN: Assessable Emissions Estimate
Air Permits Program
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Certified Mail: 7015 0640 0007 2070 4564

Re: FY 2022 Assessable Emissions – Chugach Electric Hank Nikkels Plant One and G. M. Sullivan Plant Two; AQ Permits AQ0202TVP04 and AQ0203TVP04

Dear Sir or Madame:

In accordance with 18 AAC 50.410 (b)(1), Chugach Electric Association (CEA) submits the attached projected fiscal year (FY) 2022 assessable emissions for Hank Nikkels Plant One and G.M. Sullivan Plant Two. The projected emissions are tabulated in Attachments 1 and 2, and are based on each facility's actual operation during calendar year 2020. Each attachment includes documentation of all relevant operational data and pollutant-by-pollutant emission calculations for completeness.

It is our understanding that the Department will invoice CEA based on the total assessable emissions indicated in the emissions summary table shown on the first page of each attachment. Please contact Yelena Saville at (907) 762-4579 if you have questions or require additional information regarding these FY 2022 assessable emissions estimates.

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.

Yelena V Saville

Yelena Saville

Sr. Environmental Engineer

Attachments:

1. Hank Nikkels Plant One Projected FY 2022 Assessable Emissions
2. G. M. Sullivan Plant Two Projected FY 2022 Assessable Emissions

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, Alaska 99519-6300 • (907) 563-7494 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com • info@chugachelectric.com

Attachment 1

Chugach Electric Association FY 2022 Assessable Emissions

Hank Nikkels Plant One

Summary of Projected FY 2022 Assessable Emissions
Chugach Electric Association
Hank Nikkels Plant One

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	PM2.5	VOC	SO_2
Regulated Significant	5.3	3.7	0.4	0.4	0.13	0.10
Regulated Insignificant	1.2	1.0	0.1	0.1	0.1	0.0
Subtotals	6.5	4.7	0.5	0.5	0.23	0.10
Fees Apply to Pollutant?	No	No	No	No	No	No
Total Emissions (tons)	**0**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2020.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2022 Assessable SO_2 Emission Calculations
(Based on Actual Operations During CY 2020)
Generation Plant One

No.	Emitting Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2020 Operation	Emission Rate
3a	GTG-3 Gas Turbine Generator #3	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	292 MMBtu/hr	112.0 MMscf/yr	0.0019 tpy
10	GTG-3 Air Preheater	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	4.44 MMBtu/hr	0.6 MMscf/yr	0.0000 tpy
4	GTG-4 Gas Turbine Generator #4	Mass Balance	0.2 ppmv H_2S	0.034 lb/MMscf	420 MMBtu/hr	6.4 MMscf/yr	0.0001 tpy
4a	GTG-4 Gas Turbine Generator #4	Mass Balance	0.1 wt% S	0.014 lb/gal	420 MMBtu/hr	13,916 gal/yr	0.0974 tpy
11	Cummins Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	12.3 MMBtu/hr	595 gal/yr	0.0001 tpy
		Total Emissions from Regulated Significant Units					**0.10 tpy**

Notes:

- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S content

Attachment 2

Chugach Electric Association FY 2022 Assessable Emissions

G. M. Sullivan Plant Two

Summary of Projected FY 2022 Assessable Emissions
Chugach Electric Association
G. M. Sullivan Plant 2

Emission Unit Type/Category	Projected Air Pollutant Emissions (tons per year)					
	NO_X	CO	PM_{10}	$PM_{2.5}$	VOC	SO_2
Regulated Significant	34.5	10.7	11.3	10.3	6.8	0.07
Regulated Insignificant	3.3	2.8	0.3	0.3	0.2	0.10
Subtotals	37.8	13.5	11.6	10.6	7.0	0.17
Fees Apply to Pollutant?	Yes	Yes	Yes	Yes	No	No
Total Assessable Emissions (tons)	**74**					

Notes:
- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2020.
- Calculations based on AP-42 emission factors, and mass balances, as shown in attached spreadsheets.
- Emissions from regulated insignificant sources were estimated.
- Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

Projected FY 2022 Assessable SOx Emission Calculations
(Based on Actual Operations During CY 2020)
G. M. Sullivan Plant Two

EU ID	Emitting Unit Name	Emis. Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2020 Operation	Emission Rate
2	GTG-7 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,093 MMBtu/hr	83.3 MMscf/yr	0.001 tpy
3	GTG-8 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	1,136 MMBtu/hr	11 MMscf/yr	0.000 tpy
6	GTG-9 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	430 MMBtu/hr	2,492 MMscf/yr	0.042 tpy
7	GTG-10 Gas Turbine Generator	Mass Balance	0.2 ppmv H2S	0.034 lb/MMscf	430 MMBtu/hr	1,408 MMscf/yr	0.0238 tpy
9	Caterpillar Black Start Engine	Mass Balance	0.0015 wt% S	0.00021 lb/gal	3,680 Hp	2,082 gal/yr	0.0002 tpy
		Total Emissions from Regulated Significant Units					**0.07 tpy**

Notes:

- NG heating value assumed to be 1,000 Btu/SCF
- NG fuel analysis demonstrated a <0.2 ppm H_2S concentration.

CHUGACH
POWERING ALASKA'S FUTURE

March 7, 2017

Certified Mail: 7008 0150 0000 4975 8127

RECEIVED
MAR 09 2017
ADEC AQ

Air Permits Program
Attn: Assessable Emission Estimates
Alaska Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska 99801

Subject: ***International Station Power Plant Annual Emission Estimates - Fiscal Year 2018 Air Quality Operating Permit No. AQ0164TVP03***

Dear Sir or Madame:

Chugach Electric Association, Inc. (Chugach) submits the enclosed assessable emission estimates for the International Station Power Plant (ISPP) to comply with Condition 40, Assessable Emission Estimates, of the ISPP Air Quality Operating Permit No. AQ0164TVP03, and the Alaska Department of Environmental Conservation (ADEC) 18 AAC 50.410 regulations.

The enclosed emission estimates are for Fiscal Year (FY) 2018, and are based both on the facility's actual operation during the last 12-month period (2016). The enclosure also includes documentation for all relevant operational data and assumptions as well as contaminant-by-contaminant emission calculations for completeness.

Should you or your staff have any questions concerning the ISPP FY 2018 emissions estimates, please contact me at (907) 762-4835, or via e-mail at mike_brodie@chugachelectric.com.

Sincerely,

Michael B Brodie, P.E.
Manager, Environmental Engineering & Hazardous Materials

Enclosure

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, Alaska 99519-6300 • (907) 563-7494 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com • info@chugachelectric.com

Summary of Projected Fiscal Year (FY) 2018 Assessable Emissions

International Station Power Plant

Emission Unit Type	Projected Air Contaminant Emissions (tons per year)				
	NO_X	CO	PM	VOC	SO_2
Regulated Significant	81.4	36.8	31.8	1.0	0.001
Regulated Insignificant	5.1	3.9	0.4	0.3	0.01
Subtotals	86.4	40.7	32.2	1.3	0.01
Total Assessable Emissions	160.7				

- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2016.
- Calculations based on AP-42 emission factors and mass balances, as shown in attached spreadsheets.
- Regulated insignificant emission units include those emission units identified as insignificant in Table 4-1 of the stationary source operating permit application.

Projected Fiscal Year (FY) 2018 Assessable SOx Emission Calculations
(Based on Actual Operations During Calendar Year (CY) 2016)

International Station Power Plant

Emission Unit No.	Emission Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2016 Operation	Annual Emission
1	IGT GE Frame 5 - Unit No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.1 MMscf/yr	0.00000 tpy
2	IGT GE Frame 5 - Unit No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.2 MMscf/yr	0.00000 tpy
3	IGT Westinghouse NT310GS - Unit No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	276 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
5	SPP GE LM6000 Turbine - CGT11	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,114.4 MMscf/yr	0.00026 tpy
9	SPP Duct Burner 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	6.5 MMscf/yr	0.000001 tpy
6	SPP GE LM6000 Turbine - CGT12	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,202.8 MMscf/yr	0.00027 tpy
10	SPP Duct Burner 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	6.5 MMscf/yr	0.000001 tpy
7	SPP GE LM6000 Turbine - CGT13	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,294.3 MMscf/yr	0.00027 tpy
11	SPP Duct Burner 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	6.5 MMscf/yr	0.000001 tpy
8	SPP Combustion Turbine - CGT14 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	0.0 MMscf/yr	0.00000 tpy
12	SPP Duct Burner 4 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
13	SPP Black Start Generator	Engineering Calc.	0.0015 wt. pct. S	0.00001 lb/hp-hr	2,328 hp	5.2 hr/yr	0.0001 tpy
15	SPP Auxilary Heater	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	12.50 MMBtu/hr	0.0 MMscf/yr	0.0000000 tpy
16	Building A Standby Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	175 kW	6.0 hr/yr	0.000 tpy
17	Power Unit No. 1 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	0 hr/yr	0.000 tpy
18	Power Unit No. 2 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	0 hr/yr	0.000 tpy
19	Power Unit No. 3 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	420 hp	0 hr/yr	0.000 tpy
20	IGT Unit 3-Emergency AC Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	150 kW	3 hr/yr	0.000 tpy
21	Building A Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
22	Building A Boiler No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
23	Building B ANU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.000 MMBtu/hr	8,760 hr/yr	0.0007 tpy
24	Building C Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.390 MMBtu/hr	8,760 hr/yr	0.0003 tpy
25	Building C Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.075 MMBtu/hr	8,760 hr/yr	0.0001 tpy
26	Building C Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
27	Building C Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
28	Building C Space Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
29	Building C Space Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
30	Building C Space Heater No. 5	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
31	Building C Space Heater No. 6	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
32	Building C Space Heater No. 7	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
33	Building C Space Heater No. 8	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
34	Building C Space Heater No. 9	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
35	Building C MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
36	Building C MAU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
37	Building C RTU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
38	Building C RTU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
39	Building C RTU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
40	Building C AHU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
41	Building C AHU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
42	Building C AHU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
43	Building E Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.036 MMBtu/hr	8,760 hr/yr	0.0000 tpy
44	Building E MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.631 MMBtu/hr	8,760 hr/yr	0.0005 tpy
45	Building F Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.075 MMBtu/hr	8,760 hr/yr	0.0008 tpy
46	Building F Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.200 MMBtu/hr	8,760 hr/yr	0.0001 tpy
47	Building F Coray Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
48	Building F Coray Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
49	Building F Coray Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
50	Building F Coray Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
51	Building F MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
52	Building F Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
53	Building F Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
						Total	**0.009 tpy**

- All engine heat rates assumed to be 7,000 Btu/hp-hr
- NG heating value assumed to be 1,000 Btu/SCF
- Operating hours listed for Emission Units 16 through 19 are estimates based on the number of starts in 2016.
- Operating hours listed for Emission Units 21 through 53 are based on full-time operation.
- Emission Units 4 and 14 do not exist.
- Emission Units 5 and 9, 6 and 10, 7 and 11, and 8 and 12 are each a combined unit (combustion turbine and duct burner) and emissions listed are for both.
- Emission Units 8 and 12 have not yet been constructed.

CHUGACH
POWERING ALASKA'S FUTURE

February 26, 2018

Certified Mail: 7015 0640 0007 2070 4885

RECEIVED
FEB 28 2018
ADEC AQ

Air Permits Program
Attn: Assessable Emission Estimates
Alaska Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska 99801

Subject: ***International Station Power Plant Annual Emission Estimates - Fiscal Year 2019 Air Quality Operating Permit No. AQ0164TVP03***

Dear Sir or Madame:

Chugach Electric Association, Inc. (Chugach) submits the enclosed assessable emission estimates for the International Station Power Plant (ISPP) to comply with Condition 40, Assessable Emission Estimates, of the ISPP Air Quality Operating Permit No. AQ0164TVP03, and the Alaska Department of Environmental Conservation (ADEC) 18 AAC 50.410 regulations.

The enclosed emission estimates are for Fiscal Year (FY) 2019, and are based both on the facility's actual operation during the last 12-month period (2017). The enclosure also includes documentation for all relevant operational data and assumptions as well as contaminant-by-contaminant emission calculations for completeness.

Should you or your staff have any questions concerning the ISPP FY 2019 emissions estimates, please contact me at (907) 762-4835, or via e-mail at mike_brodie@chugachelectric.com.

Sincerely,

Michael B Brodie, P.E.
Manager, Environmental Engineering & Hazardous Materials

Enclosure

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, Alaska 99519-6300 • (907) 563-7494 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com • info@chugachelectric.com

Summary of Projected Fiscal Year (FY) 2019 Assessable Emissions

International Station Power Plant

Emission Unit Type	Projected Air Contaminant Emissions (tons per year)				
	NO_X	CO	PM	VOC	SO_2
Regulated Significant	75.5	34.0	32.0	1.0	0.001
Regulated Insignificant	5.1	3.9	0.4	0.3	0.01
Subtotals	80.6	37.9	32.4	1.3	0.01
Total Assessable Emissions	152.2				

- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2017.
- Calculations based on AP-42 emission factors and mass balances, as shown in attached spreadsheets.

Projected Fiscal Year (FY) 2019 Assessable SOx Emission Calculations
(Based on Actual Operations During Calendar Year (CY) 2017)

International Station Power Plant

Emission Unit No.	Emission Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2017 Operation	Annual Emission
1	IGT GE Frame 5 - Unit No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.0 MMscf/yr	0.00000 tpy
2	IGT GE Frame 5 - Unit No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.1 MMscf/yr	0.00000 tpy
3	T Westinghouse NT310GS - Unit No. 3 (Retir	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	276 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
5	SPP GE LM6000 Turbine - CGT11	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,186.3 MMscf/yr	0.00026 tpy
9	SPP Duct Burner 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	11.8 MMscf/yr	0.000001 tpy
6	SPP GE LM6000 Turbine - CGT12	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,200.6 MMscf/yr	0.00026 tpy
10	SPP Duct Burner 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	11.8 MMscf/yr	0.000001 tpy
7	SPP GE LM6000 Turbine - CGT13	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,253.8 MMscf/yr	0.00027 tpy
11	SPP Duct Burner 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	11.8 MMscf/yr	0.000001 tpy
8	SPP Combustion Turbine - CGT14 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	0.0 MMscf/yr	0.00000 tpy
12	SPP Duct Burner 4 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
13	SPP Black Start Generator	Engineering Calc.	0.0015 wt. pct. S	0.00001 lb/hp-hr	2,328 hp	7.4 hr/yr	0.0001 tpy
15	SPP Auxilary Heater	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	12.50 MMBtu/hr	2.7 MMscf/yr	0.0000002 tpy
16	Building A Standby Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	175 kW	6.0 hr/yr	0.000 tpy
17	Power Unit No. 1 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	0 hr/yr	0.000 tpy
18	Power Unit No. 2 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	1 hr/yr	0.000 tpy
19	Power Unit No. 3 Blackstart (Retired)	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	420 hp	0 hr/yr	0.000 tpy
20	IGT Unit 3-Emergency AC Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	150 kW	0 hr/yr	0.000 tpy
21	Building A Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
22	Building A Boiler No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
23	Building B ANU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.000 MMBtu/hr	8,760 hr/yr	0.0007 tpy
24	Building C Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.390 MMBtu/hr	8,760 hr/yr	0.0003 tpy
25	Building C Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.075 MMBtu/hr	8,760 hr/yr	0.0001 tpy
26	Building C Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
27	Building C Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
28	Building C Space Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
29	Building C Space Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
30	Building C Space Heater No. 5	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
31	Building C Space Heater No. 6	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
32	Building C Space Heater No. 7	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
33	Building C Space Heater No. 8	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
34	Building C Space Heater No. 9	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
35	Building C MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
36	Building C MAU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
37	Building C RTU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
38	Building C RTU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
39	Building C RTU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
40	Building C AHU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
41	Building C AHU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
42	Building C AHU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
43	Building E Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.036 MMBtu/hr	8,760 hr/yr	0.0000 tpy
44	Building E MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.631 MMBtu/hr	8,760 hr/yr	0.0005 tpy
45	Building F Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.075 MMBtu/hr	8,760 hr/yr	0.0008 tpy
46	Building F Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.200 MMBtu/hr	8,760 hr/yr	0.0001 tpy
47	Building F Coray Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
48	Building F Coray Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
49	Building F Coray Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
50	Building F Coray Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
51	Building F MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
52	Building F Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
53	Building F Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
						Total	**0.009 tpy**

- All engine heat rates assumed to be 7,000 Btu/hp-hr
- NG heating value assumed to be 1,000 Btu/SCF
- Operating hours listed for Emission Units 16 through 19 are estimates based on the number of starts in 2017.
- Operating hours listed for Emission Units 21 through 53 are based on full-time operation.
- Emission Units 4 and 14 do not exist.
- Emission Units 5 and 9, 6 and 10, 7 and 11, and 8 and 12 are each a combined unit (combustion turbine and duct burner) and emissions listed are for both.
- Emission Units 8 and 12 have not yet been constructed.

CHUGACH
POWERING ALASKA'S FUTURE

March 6, 2019

Certified Mail: 7009 3410 0001 7886 8475

Air Permits Program
Attn: Assessable Emission Estimates
Alaska Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska 99801

Subject: ***International Station Power Plant Annual Emission Estimates - Fiscal Year 2020 Air Quality Operating Permit No. AQ0164TVP03***

Dear Sir or Madame:

Chugach Electric Association, Inc. (Chugach) submits the enclosed assessable emission estimates for the International Station Power Plant (ISPP) to comply with Condition 40, Assessable Emission Estimates, of the ISPP Air Quality Operating Permit No. AQ0164TVP03, and the Alaska Department of Environmental Conservation (ADEC) 18 AAC 50.410 regulations.

The enclosed emission estimates are for Fiscal Year (FY) 2020, and are based both on the facility's actual operation during the last 12-month period (2018). The enclosure also includes documentation for all relevant operational data and assumptions as well as contaminant-by-contaminant emission calculations for completeness.

Should you or your staff have any questions concerning the ISPP FY 2020 emissions estimates, please contact me at (907) 762-4835, or via e-mail at mike_brodie@chugachelectric.com.

Sincerely,

Michael B Brodie, P.E.
Manager, Environmental Engineering & Hazardous Materials

Enclosure

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, A[...]94 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com • info@chugachelectric.com

Summary of Projected Fiscal Year (FY) 2020 Assessable Emissions (Based on Actual Operations During Calendar Year (CY) 2018)

International Station Power Plant

Emission Unit Type	Projected Air Contaminant Emissions (tons per year)				
	NO_X	CO	PM	VOC	SO_2
Regulated Significant	75.3	33.8	31.0	1.0	0.001
Regulated Insignificant	5.1	3.9	0.4	0.3	0.01
Subtotals	80.4	37.7	31.4	1.3	0.01
Total Assessable Emissions	150.8				

- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2018.
- Calculations based on AP-42 emission factors and mass balances, as shown in attached spreadsheets.

Projected Fiscal Year (FY) 2020 Assessable SOx Emission Calculations
(Based on Actual Operations During Calendar Year (CY) 2018)

International Station Power Plant

Emission Unit No.	Emission Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2018 Operation	Annual Emission
1	IGT GE Frame 5 - Unit No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.1 MMscf/yr	0.00000 tpy
2	IGT GE Frame 5 - Unit No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.0 MMscf/yr	0.00000 tpy
3	T Westinghouse NT310GS - Unit No. 3 (Retir	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	276 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
5	SPP GE LM6000 Turbine - CGT11	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,093.2 MMscf/yr	0.00026 tpy
9	SPP Duct Burner 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
6	SPP GE LM6000 Turbine - CGT12	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,150.4 MMscf/yr	0.00026 tpy
10	SPP Duct Burner 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
7	SPP GE LM6000 Turbine - CGT13	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,136.9 MMscf/yr	0.00026 tpy
11	SPP Duct Burner 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
8	SPP Combustion Turbine - CGT14 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	0.0 MMscf/yr	0.00000 tpy
12	SPP Duct Burner 4 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
13	SPP Black Start Generator	Engineering Calc.	0.0015 wt. pct. S	0.00001 lb/hp-hr	2,328 hp	10.5 hr/yr	0.0001 tpy
15	SPP Auxilary Heater	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	12.50 MMBtu/hr	8.8 MMscf/yr	0.0000007 tpy
16	Building A Standby Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	175 kW	0.0 hr/yr	0.000 tpy
17	Power Unit No. 1 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	0 hr/yr	0.000 tpy
18	Power Unit No. 2 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	0 hr/yr	0.000 tpy
19	Power Unit No. 3 Blackstart (Retired)	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	420 hp	0 hr/yr	0.000 tpy
20	IGT Unit 3-Emergency AC Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	150 kW	0 hr/yr	0.000 tpy
21	Building A Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
22	Building A Boiler No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
23	Building B ANU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.000 MMBtu/hr	8,760 hr/yr	0.0007 tpy
24	Building C Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.390 MMBtu/hr	8,760 hr/yr	0.0003 tpy
25	Building C Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.075 MMBtu/hr	8,760 hr/yr	0.0001 tpy
26	Building C Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
27	Building C Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
28	Building C Space Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
29	Building C Space Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
30	Building C Space Heater No. 5	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
31	Building C Space Heater No. 6	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
32	Building C Space Heater No. 7	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
33	Building C Space Heater No. 8	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
34	Building C Space Heater No. 9	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
35	Building C MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
36	Building C MAU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
37	Building C RTU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
38	Building C RTU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
39	Building C RTU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
40	Building C AHU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
41	Building C AHU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
42	Building C AHU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
43	Building E Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.036 MMBtu/hr	8,760 hr/yr	0.0000 tpy
44	Building E MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.631 MMBtu/hr	8,760 hr/yr	0.0005 tpy
45	Building F Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.075 MMBtu/hr	8,760 hr/yr	0.0008 tpy
46	Building F Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.200 MMBtu/hr	8,760 hr/yr	0.0001 tpy
47	Building F Coray Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
48	Building F Coray Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
49	Building F Coray Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
50	Building F Coray Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
51	Building F MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
52	Building F Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
53	Building F Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
						Total	**0.009 tpy**

- All engine heat rates assumed to be 7,000 Btu/hp-hr
- NG heating value assumed to be 1,000 Btu/SCF
- Operating hours listed for Emission Units 16 through 19 are estimates based on the number of starts in 2018.
- Operating hours listed for Emission Units 21 through 53 are based on full-time operation.
- Emission Units 4 and 14 do not exist.
- Emission Units 5 and 9, 6 and 10, 7 and 11, and 8 and 12 are each a combined unit (combustion turbine and duct burner) and emissions listed are for both.
- Emission Units 8 and 12 have not yet been constructed.

CHUGACH
POWERING ALASKA'S FUTURE

March 3, 2020

Certified Mail: 7018 1130 0000 2685 0370

Air Permits Program
Attn: Assessable Emission Estimates
Alaska Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska 99801-1795

Subject: ***International Station Power Plant Annual Emission Estimates - Fiscal Year 2021 Air Quality Operating Permit No. AQ0164TVP03***

Dear Sir or Madame:

Chugach Electric Association, Inc. (Chugach) submits the enclosed assessable emission estimates for the International Station Power Plant (ISPP) to comply with Condition 40, Assessable Emission Estimates, of the ISPP Air Quality Operating Permit No. AQ0164TVP03, and the Alaska Department of Environmental Conservation (ADEC) 18 AAC 50.410 regulations.

The enclosed emission estimates are for Fiscal Year (FY) 2021 and are based on the facility's actual operation during the last 12-month period (2019). The enclosure also includes documentation for all relevant operational data and assumptions as well as contaminant-by-contaminant emission calculations for completeness.

Should you or your staff have any questions concerning the ISPP FY 2021 emissions estimates, please contact me at (907) 762-4513, or via e-mail at justin_penfield@chugachelectric.com.

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.

Sincerely,

Justin M. Penfield, P.E.
Environmental Engineering & Hazardous Material
Chugach Electric Association

Enclosure

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, Alaska 99519-6300 (907) 563-7494 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com • info@chugachelectric.com

International Station Power Plant
Assessable Emission Estimates – FY 2021

Summary of Projected Fiscal Year (FY) 2021 Assessable Emissions (Based on Actual Operations During Calendar Year (CY) 2019)

International Station Power Plant

Emission Unit Type	Projected Air Contaminant Emissions (tons per year)				
	NO_X	CO	PM	VOC	SO_2
Regulated Significant	73.4	18.8	30.1	1.0	0.002
Regulated Insignificant	5.1	3.9	0.4	0.3	0.01
Subtotals	78.4	22.7	30.5	1.3	0.01
Total Assessable Emissions	132.9				

- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2019.
- Calculations based on AP-42 emission factors and mass balances, as shown in attached spreadsheets.

Projected Fiscal Year (FY) 2021 Assessable SOx Emission Calculations (Based on Actual Operations During Calendar Year (CY) 2019)

International Station Power Plant

Emission Unit No.	Emission Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2019 Operation	Annual Emission
1	IGT GE Frame 5 - Unit No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	9.3 MMscf/yr	0.00000 tpy
2	IGT GE Frame 5 - Unit No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	2.3 MMscf/yr	0.00000 tpy
3	T Westinghouse NT310GS - Unit No. 3 (Retir	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	276 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
5	SPP GE LM6000 Turbine - CGT11	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,029.1 MMscf/yr	0.00025 tpy
9	SPP Duct Burner 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
6	SPP GE LM6000 Turbine - CGT12	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,050.4 MMscf/yr	0.00025 tpy
10	SPP Duct Burner 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
7	SPP GE LM6000 Turbine - CGT13	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,012.3 MMscf/yr	0.00025 tpy
11	SPP Duct Burner 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
8	SPP Combustion Turbine - CGT14 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	0.0 MMscf/yr	0.00000 tpy
12	SPP Duct Burner 4 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
13	SPP Black Start Generator	Engineering Calc.	0.0015 wt. pct. S	0.00001 lb/hp-hr	2,328 hp	77.0 hr/yr	0.0011 tpy
15	SPP Auxilary Heater	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	12.50 MMBtu/hr	0.0 MMscf/yr	0.0000000 tpy
16	Building A Standby Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	175 kW	0.0 hr/yr	0.000 tpy
17	Power Unit No. 1 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	3 hr/yr	0.000 tpy
18	Power Unit No. 2 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	3 hr/yr	0.000 tpy
19	Power Unit No. 3 Blackstart (Retired)	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	420 hp	0 hr/yr	0.000 tpy
20	IGT Unit 3-Emergency AC Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	150 kW	0 hr/yr	0.000 tpy
21	Building A Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
22	Building A Boiler No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
23	Building B ANU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.000 MMBtu/hr	8,760 hr/yr	0.0007 tpy
24	Building C Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.390 MMBtu/hr	8,760 hr/yr	0.0003 tpy
25	Building C Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.075 MMBtu/hr	8,760 hr/yr	0.0001 tpy
26	Building C Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
27	Building C Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
28	Building C Space Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
29	Building C Space Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
30	Building C Space Heater No. 5	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
31	Building C Space Heater No. 6	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
32	Building C Space Heater No. 7	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
33	Building C Space Heater No. 8	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
34	Building C Space Heater No. 9	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
35	Building C MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
36	Building C MAU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
37	Building C RTU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
38	Building C RTU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
39	Building C RTU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
40	Building C AHU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
41	Building C AHU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
42	Building C AHU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
43	Building E Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.036 MMBtu/hr	8,760 hr/yr	0.0000 tpy
44	Building E MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.631 MMBtu/hr	8,760 hr/yr	0.0005 tpy
45	Building F Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.075 MMBtu/hr	8,760 hr/yr	0.0008 tpy
46	Building F Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.200 MMBtu/hr	8,760 hr/yr	0.0001 tpy
47	Building F Coray Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
48	Building F Coray Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
49	Building F Coray Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
50	Building F Coray Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
51	Building F MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
52	Building F Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
53	Building F Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
						Total	**0.010 tpy**

- All engine heat rates assumed to be 7,000 Btu/hp-hr
- NG heating value assumed to be 1,000 Btu/SCF
- Operating hours listed for Emission Units 16 through 19 are estimates based on the number of starts in 2019.
- Operating hours listed for Emission Units 21 through 53 are based on full-time operation.
- Emission Units 4 and 14 do not exist.
- Emission Units 5 and 9, 6 and 10, 7 and 11, and 8 and 12 are each a combined unit (combustion turbine and duct burner) and emissions listed are for both.
- Emission Units 8 and 12 have not yet been constructed.

CHUGACH
POWERING ALASKA'S FUTURE

February 9, 2021

Certified Mail: **7013 1710 0001 7744 8322**

Air Permits Program
Attn: Assessable Emission Estimates
Alaska Department of Environmental Conservation
410 Willoughby Avenue
Juneau, Alaska 99801-1795

Subject: ***International Station Power Plant Annual Emission Estimates - Fiscal Year 2022 Air Quality Operating Permit No. AQ0164TVP03***

Dear Sir or Madame:

Chugach Electric Association, Inc. (Chugach) submits the enclosed assessable emission estimates for the International Station Power Plant (ISPP) to comply with Condition 40, Assessable Emission Estimates, of the ISPP Air Quality Operating Permit No. AQ0164TVP03, and the Alaska Department of Environmental Conservation (ADEC) 18 AAC 50.410 regulations.

The enclosed emission estimates are for Fiscal Year (FY) 2022 and are based on the facility's actual operation during the last 12-month period (2020). The enclosure also includes documentation for all relevant operational data and assumptions as well as contaminant-by-contaminant emission calculations for completeness.

Should you or your staff have any questions concerning the ISPP FY 2022 emissions estimates, please contact me at (907) 762-4513, or via e-mail at justin_penfield@chugachelectric.com.

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.

Sincerely,

Justin M. Penfield, P.E.
Environmental Engineering & Hazardous Material
Chugach Electric Association

Enclosure

Chugach Electric Association, Inc.
5601 Electron Drive, P.O. Box 196300, Anchorage, Alaska 99519-6300 • (907) 563-7494 Fax (907) 562-0027 • (800) 478-7494
www.chugachelectric.com info@chugachelectric.com

Summary of Projected Fiscal Year (FY) 2022 Assessable Emissions (Based on Actual Operations During Calendar Year (CY) 2020)

International Station Power Plant

Emission Unit Type	Projected Air Contaminant Emissions (tons per year)				
	NO_X	CO	PM	VOC	SO_2
Regulated Significant	70.0	22.2	29.1	0.9	0.001
Regulated Insignificant	5.1	3.9	0.4	0.3	0.01
Subtotals	75.1	26.2	29.5	1.2	0.01
Total Assessable Emissions	132.0				

- Projected assessable emissions are based on actual operation during Calendar Year (CY) 2020.
- Calculations based on AP-42 emission factors and mass balances, as shown in attached spreadsheets.

Projected Fiscal Year (FY) 2022 Assessable SOx Emission Calculations
(Based on Actual Operations During Calendar Year (CY) 2020)

International Station Power Plant

Emission Unit No.	Emission Unit Identification	Emission Factor Reference	Actual Fuel Sulfur Content	Emission Factor	Capacity	CY 2020 Operation	Annual Emission
1	IGT GE Frame 5 - Unit No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	12.7 MMscf/yr	0.00000 tpy
2	IGT GE Frame 5 - Unit No. 2 (Retired 8/31/20)	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	230 MMBtu/hr	1.6 MMscf/yr	0.00000 tpy
3	IGT Westinghouse NT310GS - Unit No. 3 (Retired)	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	276 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
5	SPP GE LM6000 Turbine - CGT11	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	3,020.7 MMscf/yr	0.00025 tpy
9	SPP Duct Burner 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
6	SPP GE LM6000 Turbine - CGT12	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	2,858.5 MMscf/yr	0.00024 tpy
10	SPP Duct Burner 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
7	SPP GE LM6000 Turbine - CGT13	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	2,931.3 MMscf/yr	0.00024 tpy
11	SPP Duct Burner 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.000000 tpy
8	SPP Combustion Turbine - CGT14 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	59,900 hp	0.0 MMscf/yr	0.00000 tpy
12	SPP Duct Burner 4 (NC)	Not Installed	1.00 ppmv H_2S	0.0002 lb/MMBtu	140 MMBtu/hr	0.0 MMscf/yr	0.00000 tpy
13	SPP Black Start Generator	Engineering Calc.	0.0015 wt. pct. S	0.00001 lb/hp-hr	2,328 hp	6.8 hr/yr	0.0001 tpy
15	SPP Auxilary Heater	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	12.50 MMBtu/hr	0.7 MMscf/yr	0.0000001 tpy
16	Building A Standby Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	175 kW	0.1 hr/yr	0.000 tpy
17	Power Unit No. 1 Blackstart	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	3 hr/yr	0.000 tpy
18	Power Unit No. 2 Blackstart (Retired 8/31/20)	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	300 hp	1 hr/yr	0.000 tpy
19	Power Unit No. 3 Blackstart (Retired)	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	420 hp	0 hr/yr	0.000 tpy
20	IGT Unit 3-Emergency AC Generator	Engineering Calc.	0.0015 wt. pct. S	0.00 lb/MMBtu	150 kW	0 hr/yr	0.000 tpy
21	Building A Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
22	Building A Boiler No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.190 MMBtu/hr	8,760 hr/yr	0.0009 tpy
23	Building B ANU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.000 MMBtu/hr	8,760 hr/yr	0.0007 tpy
24	Building C Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.390 MMBtu/hr	8,760 hr/yr	0.0003 tpy
25	Building C Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.075 MMBtu/hr	8,760 hr/yr	0.0001 tpy
26	Building C Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
27	Building C Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
28	Building C Space Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
29	Building C Space Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
30	Building C Space Heater No. 5	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
31	Building C Space Heater No. 6	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
32	Building C Space Heater No. 7	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
33	Building C Space Heater No. 8	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
34	Building C Space Heater No. 9	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
35	Building C MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
36	Building C MAU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
37	Building C RTU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
38	Building C RTU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
39	Building C RTU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.120 MMBtu/hr	8,760 hr/yr	0.0001 tpy
40	Building C AHU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
41	Building C AHU No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
42	Building C AHU No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.400 MMBtu/hr	8,760 hr/yr	0.0003 tpy
43	Building E Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.036 MMBtu/hr	8,760 hr/yr	0.0000 tpy
44	Building E MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.631 MMBtu/hr	8,760 hr/yr	0.0005 tpy
45	Building F Boiler No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.075 MMBtu/hr	8,760 hr/yr	0.0008 tpy
46	Building F Water Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.200 MMBtu/hr	8,760 hr/yr	0.0001 tpy
47	Building F Coray Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
48	Building F Coray Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
49	Building F Coray Heater No. 3	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
50	Building F Coray Heater No. 4	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.040 MMBtu/hr	8,760 hr/yr	0.0000 tpy
51	Building F MAU No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	1.010 MMBtu/hr	8,760 hr/yr	0.0007 tpy
52	Building F Space Heater No. 1	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
53	Building F Space Heater No. 2	Engineering Calc.	1.00 ppmv H_2S	0.0002 lb/MMBtu	0.105 MMBtu/hr	8,760 hr/yr	0.0001 tpy
						Total	**0.009 tpy**

- All engine heat rates assumed to be 7,000 Btu/hp-hr
- NG heating value assumed to be 1,000 Btu/SCF
- Operating hours listed for Emission Units 16 through 19 are estimates based on the number of starts in 2020.
- Operating hours listed for Emission Units 21 through 53 are based on full-time operation.
- Emission Units 4 and 14 do not exist.
- Emission Units 5 and 9, 6 and 10, 7 and 11, and 8 and 12 are each a combined unit (combustion turbine and duct burner) and emissions listed are for both.
- Emission Units 8 and 12 have not yet been constructed.

Laura K. Perry
Environmental Coordinator- Air Quality

ConocoPhillips Alaska
700 G Street
Anchorage AK 99501
Phone 907-265-6937
Fax 907-265-6216

Certified Mail
7010 3090 0002 2170 2226
Return Receipt Requested

March 31, 2015

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Ave., Suite 303
Juneau, AK 99811-1800

Subject: Alaska FY2016 Emission Fee Estimates for North Slope and Cook Inlet Facilities

ConocoPhillips Alaska, Inc. (CPAI) is submitting this emission fee estimate for state fiscal year 2016. CPAI estimates the assessable emissions for our North Slope and Cook Inlet stationary sources as follows:

Source	Assessable Emissions (tons per year)					
	NOx	CO	PM10	VOC	SO2	TOTAL
CPF-1 (AQ0267TVP01)	1903.1	285.9	54.1	467.2	104.9	**2815**
CPF-2 (AQ0273TVP01)	1523.2	146.7	50.2	412.2	80.1	**2212**
CPF-3 (AQ0171TVP01)	1033.4	568.7	41.8	51.9	99.3	**1795**
Kuparuk Seawater Treatment Plant (AQ0172TVP01)	81.9	<10	<10	<10	<10	**82**
Kuparuk Transportable Drilling Rigs (AQ0909TVP01)	144.6	43.7	<10	<10	<10	**188**
Alpine (AQ0489TVP01)	960.4	177.5	28.6	20.5	17.6	**1205**
Alpine Transportable Drilling Rigs	148.6	36.9	<10	<10	<10	**185**
Alpine CD-5	0	0	0	0	0	**0**
Tyonek Platform (AQ0091TVP02)	136	56	<10	16	<10	**208**
Kenai LNG Plant (AQ0090TVP02)	338	82	12	305	<10	**737**

Beluga River Unit (AQ0942TVP01)	43	33	<10	<10	<10	**76**

These estimates are based on projected actual emissions and are derived from actual operation during calendar year 2014. Documentation of relevant operational data and pollutant-by-pollutant emission calculations is included in the attachments. Please note, the drill rig emission estimates include non-road engines, so the estimates for those units are conservatively high.

Alpine CD-5 has not yet been constructed and thus emissions from this facility are zero.

Please contact me at (907) 265-6937 if you have any questions.

Sincerely,

Laura Perry
Environmental Coordinator- Air Quality

Attachments:

Attachment 1 – Kuparuk River Unit CPF-1, CPF-2, CPF-3, KSTP, DS-1E/1J
Attachment 2 – Kuparuk River Unit Transportable Drilling Rigs
Attachment 3 – Alpine Processing Facility
Attachment 4 – Alpine Transportable Drilling Rigs
Attachment 5 – Cook Inlet Tyonek Platform
Attachment 6 – Cook Inlet Kenai LNG Plant
Attachment 7 – Cook Inlet Beluga River Unit

Statement of Certification (Kuparuk)

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: ______________________ Date: 03/30/15

Ty Maxey
GKA Operations Manager

Statement of Certification (Transportable Drill Rigs)

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: M. W. Wheatall Date: 3/30/15

Michael Wheatall
Manager, Drilling and Well Operations

Statement of Certification (Alpine)

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: ______________________ Date: 3/30/15

Stephen Thatcher
Western North Slope Operations Manager

Statement of Certification (Cook Inlet)

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: ______________________ Date: 3/30/15

Kevin Snow
Cook Inlet Asset Manager

Attachment No. 1

Kuparuk River Unit CPF-1, CPF-2, CPF-3, KSTP, DS-1E/1J

ConocoPhillips Alaska, Inc.

Total Quarterly and Annual Actual Emissions Summary
(with Drill Sites 1E & 1J [including Drill Rig Htrs/Boilers, Camp Engines, and Temp. Crude Oil Storage Tanks], Well Flowback VOC, Portable Heaters, DS1R Well Injection Engines, and Production Tanks VOC)

Kuparuk Central Production Facility No. 1

Version 2014.5

2014							
Pollutant	**1st Quarter (tons)**	**2nd Quarter (tons)**	**3rd Quarter (tons)**	**4th Quarter (tons)**	**Total (tpy)**	**Well Flowback (tpy)**	**Grand Total (tpy)**
NO_x	509.1	440.8	445.3	507.9	1,903.1	n/a	1,903.1
CO	80.5	71.5	66.8	67.0	285.9	n/a	285.9
VOC	113.0	110.8	110.3	110.9	445.0	22.2	467.2
SO_2	27.7	24.6	27.0	25.5	104.9	n/a	104.9
PM_{10}	14.4	13.1	12.8	13.7	54.1	n/a	54.1
						Sum Total =	2,815

H_2S ppmv (Except Units 14 & 17)	87.9	98.3	112.0	85.3
H_2S ppmv (Units 14 & 17 only)	129.9	96.3	104.8	107.6
Sulfur Content (ULSD; wt%)	0.000300	0.000300	0.000300	0.000300
Sulfur Content (LEPD; wt%)	0.104	0.112	0.111	0.126

ConocoPhillips Alaska, Inc.

Total Quarterly and Annual Actual Emissions Summary
(with Well Flowback VOC, Portable Heaters, and Production Tanks VOC)

Kuparuk Central Production Facility No. 2

Version 2014.5

2014							
Pollutant	**1st Quarter (tons)**	**2nd Quarter (tons)**	**3rd Quarter (tons)**	**4th Quarter (tons)**	**Total (tpy)**	**Well Flowback (tpy)**	**Grand Total (tpy)**
NO_x	353.1	347.1	389.7	433.4	1,523.2	n/a	1,523.2
CO	34.9	37.3	38.1	36.5	146.7	n/a	146.7
VOC	102.7	103.1	103.3	103.1	412.2	0.0	412.2
SO_2	20.6	19.6	19.7	20.1	80.1	n/a	80.1
PM_{10}	11.8	11.7	12.8	13.9	50.2	n/a	50.2
						Sum Total =	2,212

H_2S ppmv	100.0	94.4	87.5	83.6
Sulfur Content (ULSD; wt%)	0.000300	0.000300	0.000300	0.000300
Sulfur Content (LEPD; wt%)	0.104	0.112	0.111	0.126

ConocoPhillips Alaska, Inc.

Total Quarterly and Annual Actual Emissions Summary
(with Well Flowback VOC, Portable Heaters, and Production Tanks VOC)

Kuparuk Central Production Facility No. 3

Version 2014.5

2014							
Pollutant	**1st Quarter (tons)**	**2nd Quarter (tons)**	**3rd Quarter (tons)**	**4th Quarter (tons)**	**Total (tpy)**	**Well Flowback (tpy)**	**Grand Total (tpy)**
NO_x	267.3	261.9	240.2	264.0	1,033.4	n/a	1,033.4
CO	152.2	152.9	115.6	147.9	568.7	n/a	568.7
VOC	13.2	13.1	12.9	12.6	51.9	0.0	51.9
SO_2	26.7	27.0	23.8	21.8	99.3	n/a	99.3
PM_{10}	10.9	10.6	9.7	10.6	41.8	n/a	41.8
						Sum Total =	1,795

H_2S ppmv	145.5	149.4	137.8	114.2
Sulfur Content (ULSD; wt%)	0.000300	0.000300	0.000300	0.000300
Sulfur Content (LEPD; wt%)	0.104	0.112	0.111	0.126

ConocoPhillips Alaska, Inc.

Total Quarterly and Annual Actual Emissions Summary
(with Tanks VOC)
Kuparuk Seawater Treatment Plant

Version 2014.5

2014					
Pollutant	**1st Quarter (tons)**	**2nd Quarter (tons)**	**3rd Quarter (tons)**	**4th Quarter (tons)**	**Total (tpy)**
NO_x	24.4	18.9	14.6	24.1	81.9
CO	1.9	1.5	1.2	1.8	6.4
VOC	1.0	0.6	0.4	1.0	3.0
SO_2	2.2	1.7	1.0	1.9	6.8
PM_{10}	1.1	0.9	0.7	1.1	3.7
Sum Total (only pollutants w/ emissions >10 tpy) =					82
H_2S ppmv Units 1-2	140.7	149.6	134.5	115.4	
H_2S ppmv Units 3-5	50.1	44.9	14.9	43.8	
Sulfur Content (ULSD; wt%)	0.000300	0.000300	0.000300	0.000300	
Sulfur Content (LEPD; wt%)	0.104	0.112	0.111	0.126	

ConocoPhillips Alaska, Inc.

Total Monthly Actual VOC Emissions Summary

Kuparuk DS1E/1J Temporary Crude Oil Storage Tanks (EU ID 56)

2014

Version 2014.5

Location	Jan (tons)	Feb (tons)	Mar (tons)	Apr (tons)	May (tons)	Jun (tons)	Jul (tons)	Aug (tons)	Sep (tons)	Oct (tons)	Nov (tons)	Dec (tons)	Year to Date Total (tons)
DS1E	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DS1J	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	Actual MMBtu/hr																
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Gas Turbines																					
C-2101-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	159.00	160.90	159.67	**159.83**	155.85	148.78	143.50	**149.37**	140.55	141.74	145.11	**142.44**	148.65	151.07	156.28	**152.04**	**150.80**
C-2101-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	152.54	153.28	152.91	**152.90**	149.23	143.36	138.27	**143.62**	135.51	136.18	139.09	**136.91**	143.04	145.95	149.58	**146.21**	**144.79**
C-2101-C	3	GE Frame 3K (MS3002)	16,260 hp	gas	157.37	158.84	157.73	**157.96**	152.60	145.49	140.69	**146.32**	138.90	139.32	142.88	**140.34**	145.73	149.35	153.99	**149.75**	**148.41**
G-201-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.00	0.00	0.00	**0.00**	39.64	0.00	31.61	**38.11**	39.79	38.81	32.50	**36.47**	38.35	36.74	37.09	**37.40**	**37.26**
G-201-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-201-B	5	EGT (Ruston) TB5000	4,900 hp	gas	40.78	41.84	37.76	**40.09**	37.24	33.97	33.14	**34.77**	39.86	39.07	34.58	**38.42**	35.40	35.00	38.14	**37.18**	**37.49**
G-201-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-201-C	6	EGT (Ruston) TB5000	4,900 hp	gas	40.54	41.16	34.49	**38.65**	36.83	33.11	32.18	**33.99**	35.81	31.08	31.67	**33.08**	0.00	33.91	33.38	**33.62**	**35.26**
G-201-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	47.94	**47.94**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**47.94**
G-201-D	7	EGT (Ruston) TB5000	4,900 hp	gas	40.56	37.27	36.00	**37.97**	36.51	32.71	32.03	**33.72**	33.85	30.60	31.94	**32.14**	38.26	37.09	36.26	**37.42**	**35.23**
G-201-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	47.94	**47.94**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**47.94**
G-3201-E	8	EGT (Ruston) TB5000	4,900 hp	gas	65.79	0.00	35.94	**36.44**	41.60	0.00	33.27	**40.00**	27.80	37.22	40.19	**38.46**	0.00	36.07	38.55	**37.66**	**38.76**
G-3201-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-3201-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-3201-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
P-2202-A	10	EGT (Ruston) TB5400	5,400 hp	gas	41.85	39.48	38.81	**40.11**	40.98	41.46	40.57	**41.06**	40.14	40.87	39.37	**40.11**	40.08	40.83	38.49	**39.78**	**40.24**
P-2202-B	11	EGT (Ruston) TB5400	5,400 hp	gas	43.40	41.92	40.11	**42.11**	40.54	41.63	39.65	**40.70**	41.31	42.29	40.12	**41.07**	41.51	42.39	40.49	**41.47**	**41.36**
P-CL07-A	12	EGT (Ruston) TB5400	5,400 hp	gas	43.89	43.39	41.87	**43.05**	44.15	44.18	41.83	**43.48**	41.72	42.24	41.25	**41.81**	41.45	41.07	41.95	**41.58**	**42.53**
P-CL07-A	**12**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
P-CL07-B	13	EGT (Ruston) TB5400	5,400 hp	gas	41.45	36.28	35.89	**37.48**	38.42	38.42	37.94	**38.25**	37.88	38.75	37.44	**38.04**	37.49	37.24	38.03	**37.65**	**37.87**
P-CL07-B	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-3203	14	GE Frame 6 (MS6001B)	53,500 hp	gas	346.74	373.99	322.27	**346.80**	302.77	292.84	262.16	**283.40**	274.91	247.04	300.25	**273.30**	325.13	323.55	384.37	**344.53**	**313.06**
Gas-Fired Heaters (Excluding Drill Site Heaters)																					
H-201	15	Broach	27.80 MMBtu/hr	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
H-201	**15**	**Broach**	**27.80 MMBtu/hr**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G1-14-01	16	Born Crude Heater	44.40 MMBtu/hr	gas	33.98	33.35	30.72	**32.67**	29.29	29.47	29.49	**29.43**	29.03	30.28	29.92	**29.57**	31.27	32.42	33.65	**32.45**	**31.19**
H-3204	17	Kvaerner process	9.70 MMBtu/hr	gas	3.63	3.88	3.57	**3.69**	3.21	3.20	2.92	**3.10**	2.50	2.56	2.63	**2.56**	2.79	3.12	4.04	**3.32**	**3.19**
H-102A	18	ICE Heater	4.38 MMBtu/hr	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
H-102A	**18**	**ICE Heater**	**4.38 MMBtu/hr**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Diesel-Fired Equipment > 600 hp																					
G-701-A	19	Waukesha	1,086 hp	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	7.45	**7.45**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.45**
G-701-B	20	Waukesha	1,086 hp	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	7.45	**7.45**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.45**
Diesel-Fired Equipment < 600 hp																					
P-CL04-ECC	21	GM Detroit Allison	215 hp	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
P-1A02	22	GM Detroit Allison (1A)	240 hp	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
~~P-1E02~~		~~GM Detroit Allison (1E)~~	~~240 hp~~	~~liquid~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~
P-1F02	23	GM Detroit Allison (1F)	318 hp	liquid	1.65	0.00	1.65	**1.65**	0.00	0.00	1.65	**1.65**	0.00	0.00	1.65	**1.65**	0.00	0.00	0.00	**0.00**	**1.65**
P-1G02	24	GM Detroit Allison (1G)	318 hp	liquid	0.00	1.65	0.00	**1.65**	0.00	1.65	0.00	**1.65**	1.65	0.00	0.00	**1.65**	1.65	1.65	1.65	**1.65**	**1.65**
P-1L02	25	GM Detroit Allison (1L)	300 hp	liquid	2.06	2.06	2.06	**2.06**	2.06	0.00	0.00	**2.06**	0.00	0.00	2.06	**2.06**	0.00	0.00	0.00	**0.00**	**2.06**
P-1Q02	26	GM Detroit Allison (1Q)	300 hp	liquid	0.00	0.00	2.06	**2.06**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**2.06**
P-1R02	27	GM Detroit Allison (1R)	300 hp	liquid	0.00	0.00	0.00	**0.00**	2.06	0.00	0.00	**2.06**	0.00	2.06	0.00	**2.06**	2.06	2.06	0.00	**2.06**	**2.06**
P-1Y02	28	GM Detroit Allison (1Y)	300 hp	liquid	0.00	0.00	2.06	**2.06**	2.06	0.00	0.00	**2.06**	0.00	0.00	0.00	**0.00**	2.06	2.06	0.00	**2.06**	**2.06**
Flares																					
All Flares	29-33	NA	NA	gas	108.76	110.64	109.07	**109.45**	141.88	85.90	88.79	**103.04**	91.90	88.53	91.01	**90.46**	99.45	88.24	61.29	**81.60**	**96.33**
Incinerators																					
H-250	35	Incinerator	1,300 lb/hr	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
H-347	36	Incinerator	900 lb/hr	gas	2.06	2.06	2.06	**2.06**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**2.06**
Other Equipment (Drill Site Heaters)																					
H-1A01	37	Drill Site Heater (1A)	16.40 MMBtu/hr	gas	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	**16.18**
H-1B01	38	Drill Site Heater (1B)	16.40 MMBtu/hr	gas	0.00	0.00	16.18	**16.18**	0.00	0.00	0.00	**0.00**	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	**16.18**
H-2V01	39	Drill Site Heater (1C)	14.50 MMBtu/hr	gas	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	**14.33**
H-3F01	40	Drill Site Heater (1D)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
~~H-1E01~~	~~41~~	~~Drill Site Heater (1E)~~	~~16.40 MMBtu/hr~~	~~gas~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~
H-1F01	43	Drill Site Heater (1F)	14.90 MMBtu/hr	gas	14.66	14.66	14.66	**14.66**	14.66	14.66	0.00	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	**14.66**
H-1G01	44	Drill Site Heater (1G)	14.90 MMBtu/hr	gas	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	**14.66**
H-1F-1901	45	Drill Site Heater (1H)	16.40 MMBtu/hr	gas	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	16.18	16.18	16.18	**16.18**	**16.18**
H-1Q01	48	Drill Site Heater (1Q)	21.00 MMBtu/hr	gas	20.74	20.74	20.74	**20.74**	20.74	20.74	20.74	**20.74**	20.74	20.74	20.74	**20.74**	20.74	20.74	20.74	**20.74**	**20.74**
H-1R01	49	Drill Site Heater (1R)	17.20 MMBtu/hr	gas	16.94	16.94	16.94	**16.94**	16.94	16.94	16.94	**16.94**	16.94	16.94	16.94	**16.94**	16.94	16.94	16.94	**16.94**	**16.94**
H-1Y01	50	Drill Site Heater (1Y)	14.90 MMBtu/hr	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	14.66	0.00	**14.66**	**14.66**
Drill Site 1R Well Injection Engines																					
5010A + 5010B	64 + 65	Detroit Diesel Well Injection Pump	440 hp	liquid	3.09	3.09	3.09	**3.09**	3.09	3.09	0.00	**3.09**	0.00	0.00	0.00	**0.00**	0.00	3.09	0.00	**3.09**	**3.09**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	NO_x EF lb/MMBtu	NO_x Emission Rate (tons) Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-2101-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.358	21.2	19.4	19.2	**59.7**	20.1	19.8	18.5	**58.4**	18.7	18.9	18.7	**56.3**	19.2	19.5	20.8	**59.5**	**234.0**
C-2101-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.358	20.3	18.4	18.1	**56.9**	19.2	19.1	17.8	**56.1**	18.0	18.1	17.9	**54.1**	18.7	18.8	19.9	**57.4**	**224.6**
C-2101-C	3	GE Frame 3K (MS3002)	16,260 hp	gas	0.358	21.0	19.1	17.3	**57.4**	19.5	19.4	17.4	**56.3**	18.5	18.6	18.4	**55.5**	18.6	19.3	20.5	**58.4**	**227.6**
G-201-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.286	0.0	0.0	0.0	**0.0**	2.3	0.0	0.4	**2.7**	2.5	0.4	1.9	**4.8**	4.1	3.8	3.9	**11.8**	**19.4**
G-201-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.880	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.3	4.0	4.0	**12.3**	3.8	3.6	3.4	**10.8**	2.6	0.4	0.9	**3.9**	0.0	1.6	4.1	**5.7**	**32.7**
G-201-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.880	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.3	4.0	3.7	**11.9**	3.6	3.5	3.3	**10.5**	3.8	3.3	1.7	**8.8**	0.0	0.7	0.9	**1.6**	**32.8**
G-201-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.880	0.000	0.000	0.216	**0.216**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.216**
G-201-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.3	3.6	3.8	**11.7**	3.7	3.5	3.3	**10.4**	3.6	3.3	2.8	**9.6**	4.1	3.6	1.8	**9.5**	**41.3**
G-201-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.880	0.000	0.000	0.211	**0.211**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.211**
G-3201-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.286	0.0	0.0	0.1	**0.1**	2.4	0.0	0.5	**2.9**	0.0	0.0	0.3	**0.3**	0.0	0.9	1.8	**2.7**	**6.0**
G-3201-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.880	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3201-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.286	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-3201-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.880	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-2202-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.328	5.1	3.5	4.7	**13.3**	4.8	4.8	3.2	**12.8**	4.9	4.5	4.6	**14.1**	4.4	4.8	4.7	**13.9**	**54.1**
P-2202-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.328	5.3	3.6	2.8	**11.7**	2.8	4.1	3.1	**10.0**	5.0	2.4	4.1	**11.5**	5.0	5.0	4.7	**14.8**	**48.0**
P-CL07-A	12	EGT (Ruston) TB5400	5,400 hp	gas	0.328	5.4	4.8	5.0	**15.2**	5.2	4.7	3.9	**13.7**	4.1	5.2	3.3	**12.6**	4.0	2.7	5.1	**11.7**	**53.2**
P-CL07-A	**12**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.880	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CL07-B	13	EGT (Ruston) TB5400	5,400 hp	gas	0.328	3.3	3.6	4.3	**11.2**	4.5	3.7	4.5	**12.7**	4.6	4.7	4.3	**13.6**	4.2	2.7	4.6	**11.5**	**49.0**
P-CL07-B	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.880	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3203	14	GE Frame 6 (MS6001B)	53,500 hp	gas	0.558	72.0	70.1	66.8	**208.9**	36.0	60.8	52.7	**149.5**	57.1	51.3	57.1	**165.4**	67.5	65.1	79.6	**212.2**	**736.0**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-201	15	Broach	27.80 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-201	**15**	**Broach**	**27.80 MMBtu/hr**	**liquid**	0.146	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G1-14-01	16	Born Crude Heater	44.40 MMBtu/hr	gas	0.100	1.4	1.2	1.2	**3.9**	0.9	1.2	1.2	**3.2**	1.2	0.6	0.7	**2.5**	1.3	1.3	1.4	**3.9**	**13.5**
H-3204	17	Kvaerner process	9.70 MMBtu/hr	gas	0.100	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.2	**0.4**	**1.4**
H-102A	18	ICE Heater	4.38 MMBtu/hr	gas	0.098	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-102A	**18**	**ICE Heater**	**4.38 MMBtu/hr**	**liquid**	0.146	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-701-A	19	Waukesha	1,086 hp	liquid	3.200	0.000	0.000	0.000	**0.000**	0.000	0.000	0.010	**0.010**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.010**
G-701-B	20	Waukesha	1,086 hp	liquid	3.200	0.000	0.000	0.000	**0.000**	0.000	0.000	0.011	**0.011**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.011**
Diesel-Fired Equipment < 600 hp																						
P-CL04-ECC	21	GM Detroit Allison	215 hp	liquid	4.410	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1A02	22	GM Detroit Allison (1A)	240 hp	liquid	4.410	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
~~P-1E02~~		~~GM Detroit Allison (1E)~~	~~240 hp~~	~~liquid~~	~~4.410~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~
P-1F02	23	GM Detroit Allison (1F)	318 hp	liquid	4.410	0.003	0.000	0.008	**0.012**	0.000	0.000	0.003	**0.003**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	**0.015**
P-1G02	24	GM Detroit Allison (1G)	318 hp	liquid	4.410	0.000	0.002	0.000	**0.002**	0.000	0.002	0.000	**0.002**	0.001	0.000	0.000	**0.001**	0.005	0.001	0.005	**0.011**	**0.016**
P-1L02	25	GM Detroit Allison (1L)	300 hp	liquid	4.410	0.002	0.005	0.004	**0.010**	0.024	0.000	0.000	**0.024**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	**0.036**
P-1Q02	26	GM Detroit Allison (1Q)	300 hp	liquid	4.410	0.000	0.000	0.004	**0.004**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.004**
P-1R02	27	GM Detroit Allison (1R)	300 hp	liquid	4.410	0.000	0.000	0.000	**0.000**	0.002	0.000	0.000	**0.002**	0.000	0.002	0.000	**0.002**	0.004	0.010	0.000	**0.013**	**0.018**
P-1Y02	28	GM Detroit Allison (1Y)	300 hp	liquid	4.410	0.000	0.000	0.009	**0.009**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.002	0.005	0.000	**0.007**	**0.018**
Flares																						
All Flares	29-33	NA	NA	gas	0.068	2.8	2.5	2.8	**8.0**	2.9	2.2	2.2	**7.2**	2.3	2.2	1.8	**6.3**	2.0	2.2	1.6	**5.7**	**27.2**
Incinerators																						
H-250	35	Incinerator	1,300 lb/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-347	36	Incinerator	900 lb/hr	gas		0.1	0.1	0.0	**0.3**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.3**
Other Equipment (Drill Site Heaters)																						
H-1A01	37	Drill Site Heater (1A)	16.40 MMBtu/hr	gas	0.100	0.7	0.6	0.7	**1.9**	0.6	0.5	0.0	**1.2**	0.1	0.7	0.6	**1.4**	0.7	0.6	0.7	**2.0**	**6.5**
H-1B01	38	Drill Site Heater (1B)	16.40 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.6	0.7	0.6	**2.0**	0.7	0.6	0.7	**2.0**	**3.9**
H-2V01	39	Drill Site Heater (1C)	14.50 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.6	0.6	**1.7**	0.5	0.6	0.6	**1.6**	0.6	0.6	0.6	**1.7**	**6.8**
H-3F01	40	Drill Site Heater (1D)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.5	0.8	**2.1**	0.8	0.7	0.8	**2.2**	0.8	0.8	0.8	**2.3**	**8.9**
~~H-1E01~~	~~41~~	~~Drill Site Heater (1E)~~	~~16.40 MMBtu/hr~~	~~gas~~	~~0.100~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
H-1F01	43	Drill Site Heater (1F)	14.90 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.5	0.0	**1.1**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	**6.4**
H-1G01	44	Drill Site Heater (1G)	14.90 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.6	0.5	**1.7**	0.5	0.6	0.6	**1.7**	0.6	0.6	0.6	**1.8**	**6.9**
H-1F-1901	45	Drill Site Heater (1H)	16.40 MMBtu/hr	gas	0.100	0.7	0.6	0.7	**1.9**	0.6	0.7	0.6	**1.9**	0.6	0.7	0.6	**2.0**	0.7	0.6	0.7	**2.0**	**7.8**
H-1Q01	48	Drill Site Heater (1Q)	21.00 MMBtu/hr	gas	0.100	0.9	0.5	0.6	**2.0**	0.7	0.9	0.8	**2.4**	0.9	0.9	0.8	**2.5**	0.9	0.8	0.9	**2.5**	**9.4**
H-1R01	49	Drill Site Heater (1R)	17.20 MMBtu/hr	gas	0.100	0.7	0.6	0.7	**2.0**	0.6	0.7	0.6	**1.9**	0.6	0.7	0.7	**2.0**	0.7	0.7	0.7	**2.1**	**8.0**
H-1Y01	50	Drill Site Heater (1Y)	14.90 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Drill Site 1R Well Injection Engines																						
5010A + 5010B	64 + 65	Detroit Diesel Well Injection Pump	440 hp	liquid	3.570	0.24	0.37	0.33	**0.94**	0.42	0.08	0.00	**0.49**	0.00	0.00	0.00	**0.00**	0.00	0.17	0.00	**0.17**	**1.60**
					Total	176.6	163.2	160.0	**499.8**	137.4	155.5	139.2	**432.2**	152.4	139.8	144.6	**436.8**	159.2	158.3	181.6	**499.2**	**1,867.9**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-2101-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.020	1.2	1.1	1.1	**3.3**	1.1	1.1	1.0	**3.3**	1.0	1.1	1.0	**3.1**	1.1	1.1	1.2	**3.3**	**13.1**
C-2101-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.020	1.1	1.0	1.0	**3.2**	1.1	1.1	1.0	**3.1**	1.0	1.0	1.0	**3.0**	1.0	1.1	1.1	**3.2**	**12.5**
C-2101-C	3	GE Frame 3K (MS3002)	16,260 hp	gas	0.020	1.2	1.1	1.0	**3.2**	1.1	1.1	1.0	**3.1**	1.0	1.0	1.0	**3.1**	1.0	1.1	1.1	**3.3**	**12.7**
G-201-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.0	0.0	0.0	**0.0**	0.2	0.0	0.0	**0.3**	0.2	0.0	0.2	**0.5**	0.4	0.4	0.4	**1.1**	**1.8**
G-201-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.4	0.4	**1.2**	0.4	0.3	0.3	**1.0**	0.2	0.0	0.1	**0.4**	0.0	0.2	0.4	**0.5**	**3.1**
G-201-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.4	0.3	**1.1**	0.3	0.3	0.3	**1.0**	0.4	0.3	0.2	**0.8**	0.0	0.1	0.1	**0.2**	**3.1**
G-201-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
G-201-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.3	0.4	**1.1**	0.3	0.3	0.3	**1.0**	0.3	0.3	0.3	**0.9**	0.4	0.3	0.2	**0.9**	**3.9**
G-201-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
G-3201-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.0	0.0	0.0	**0.0**	0.2	0.0	0.0	**0.3**	0.0	0.0	0.0	**0.0**	0.0	0.1	0.2	**0.3**	**0.6**
G-3201-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3201-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-3201-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-2202-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.6	0.4	0.5	**1.5**	0.5	0.5	0.4	**1.4**	0.6	0.5	0.5	**1.6**	0.5	0.5	0.5	**1.6**	**6.1**
P-2202-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.6	0.4	0.3	**1.3**	0.3	0.5	0.3	**1.1**	0.6	0.3	0.5	**1.3**	0.6	0.6	0.5	**1.7**	**5.4**
P-CL07-A	12	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.6	0.5	0.6	**1.7**	0.6	0.5	0.4	**1.5**	0.5	0.6	0.4	**1.4**	0.4	0.3	0.6	**1.3**	**6.0**
P-CL07-A	**12**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CL07-B	13	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.4	0.4	0.5	**1.3**	0.5	0.4	0.5	**1.4**	0.5	0.5	0.5	**1.5**	0.5	0.3	0.5	**1.3**	**5.5**
P-CL07-B	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3203	14	GE Frame 6 (MS6001B)	53,500 hp	gas	0.026	3.4	3.3	3.1	**9.7**	1.7	2.8	2.5	**7.0**	2.7	2.4	2.7	**7.7**	3.1	3.0	3.7	**9.9**	**34.3**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-201	15	Broach	27.80 MMBtu/hr	gas	0.082	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-201	**15**	**Broach**	**27.80 MMBtu/hr**	**liquid**	0.036	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G1-14-01	16	Born Crude Heater	44.40 MMBtu/hr	gas	0.018	0.3	0.2	0.2	**0.7**	0.2	0.2	0.2	**0.6**	0.2	0.1	0.1	**0.4**	0.2	0.2	0.2	**0.7**	**2.4**
H-3204	17	Kvaerner process	9.70 MMBtu/hr	gas	0.082	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	**1.2**
H-102A	18	ICE Heater	4.38 MMBtu/hr	gas	0.082	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-102A	**18**	**ICE Heater**	**4.38 MMBtu/hr**	**liquid**	0.036	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-701-A	19	Waukesha	1,086 hp	liquid	0.850	0.000	0.000	0.000	**0.000**	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
G-701-B	20	Waukesha	1,086 hp	liquid	0.850	0.000	0.000	0.000	**0.000**	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Diesel-Fired Equipment < 600 hp																						
P-CL04-ECC	21	GM Detroit Allison	215 hp	liquid	0.950	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1A02	22	GM Detroit Allison (1A)	240 hp	liquid	0.950	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
~~P-1E02~~		~~GM Detroit Allison (1E)~~	~~240 hp~~	~~liquid~~	~~0.950~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~
P-1F02	23	GM Detroit Allison (1F)	318 hp	liquid	0.950	0.001	0.000	0.002	**0.002**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
P-1G02	24	GM Detroit Allison (1G)	318 hp	liquid	0.950	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.001	0.000	0.001	**0.002**	**0.004**
P-1L02	25	GM Detroit Allison (1L)	300 hp	liquid	0.950	0.000	0.001	0.001	**0.002**	0.005	0.000	0.000	**0.005**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.008**
P-1Q02	26	GM Detroit Allison (1Q)	300 hp	liquid	0.950	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
P-1R02	27	GM Detroit Allison (1R)	300 hp	liquid	0.950	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.001	0.002	0.000	**0.003**	**0.004**
P-1Y02	28	GM Detroit Allison (1Y)	300 hp	liquid	0.950	0.000	0.000	0.002	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	**0.004**
Flares																						
All Flares	29-33	NA	NA	gas	0.370	15.0	13.8	15.0	**43.7**	15.6	11.8	11.8	**39.2**	12.6	11.8	9.8	**34.2**	10.6	11.8	8.4	**30.9**	**148.0**
Incinerators																						
H-250	35	Incinerator	1,300 lb/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-347	36	Incinerator	900 lb/hr	gas		0.3	0.3	0.0	**0.6**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.6**
Other Equipment (Drill Site Heaters)																						
H-1A01	37	Drill Site Heater (1A)	16.40 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.0	**0.2**	0.0	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	**1.2**
H-1B01	38	Drill Site Heater (1B)	16.40 MMBtu/hr	gas	0.018	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**0.7**
H-2V01	39	Drill Site Heater (1C)	14.50 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-3F01	40	Drill Site Heater (1D)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.6**
~~H-1E01~~	~~41~~	~~Drill Site Heater (1E)~~	~~16.40 MMBtu/hr~~	~~gas~~	~~0.018~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
H-1F01	43	Drill Site Heater (1F)	14.90 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.0	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-1G01	44	Drill Site Heater (1G)	14.90 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-1F-1901	45	Drill Site Heater (1H)	16.40 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.4**
H-1Q01	48	Drill Site Heater (1Q)	21.00 MMBtu/hr	gas	0.018	0.2	0.1	0.1	**0.4**	0.1	0.2	0.1	**0.4**	0.2	0.2	0.1	**0.5**	0.2	0.1	0.2	**0.5**	**1.7**
H-1R01	49	Drill Site Heater (1R)	17.20 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.4**
H-1Y01	50	Drill Site Heater (1Y)	14.90 MMBtu/hr	gas	0.018	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Drill Site 1R Well Injection Engines																						
5010A + 5010B	64 + 65	Detroit Diesel Well Injection Pump	440 hp	liquid	0.225	0.01	0.02	0.02	**0.06**	0.03	0.00	0.00	**0.03**	0.00	0.00	0.00	**0.00**	0.00	0.01	0.00	**0.01**	**0.10**
					Total	26.8	24.5	25.5	**76.8**	25.1	22.1	21.0	**68.2**	22.9	21.1	19.4	**63.4**	21.1	22.2	20.4	**63.7**	**272.1**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-2101-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.002	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.4**
C-2101-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.002	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.3**
C-2101-C	3	GE Frame 3K (MS3002)	16,260 hp	gas	0.002	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.3**
G-201-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	**0.1**
G-201-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
G-201-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	**0.2**
G-201-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
G-201-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3201-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-3201-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3201-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-3201-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-2202-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
P-2202-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
P-CL07-A	12	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
P-CL07-A	**12**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CL07-B	13	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
P-CL07-B	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3203	14	GE Frame 6 (MS6001B)	53,500 hp	gas	0.011	1.4	1.4	1.3	**4.0**	0.7	1.2	1.0	**2.9**	1.1	1.0	1.1	**3.2**	1.3	1.3	1.5	**4.1**	**14.2**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-201	15	Broach	27.80 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-201	**15**	**Broach**	**27.80 MMBtu/hr**	**liquid**	0.001	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G1-14-01	16	Born Crude Heater	44.40 MMBtu/hr	gas	0.005	0.1	0.1	0.1	**0.2**	0.0	0.1	0.1	**0.2**	0.1	0.0	0.0	**0.1**	0.1	0.1	0.1	**0.2**	**0.7**
H-3204	17	Kvaerner process	9.70 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
H-102A	18	ICE Heater	4.38 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-102A	**18**	**ICE Heater**	**4.38 MMBtu/hr**	**liquid**	0.002	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-701-A	19	Waukesha	1,086 hp	liquid	0.082	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-701-B	20	Waukesha	1,086 hp	liquid	0.082	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment < 600 hp																						
P-CL04-ECC	21	GM Detroit Allison	215 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1A02	22	GM Detroit Allison (1A)	240 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
~~P-1E02~~		~~GM Detroit Allison (1E)~~	~~240 hp~~	~~liquid~~	~~0.350~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~
P-1F02	23	GM Detroit Allison (1F)	318 hp	liquid	0.350	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
P-1G02	24	GM Detroit Allison (1G)	318 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	**0.001**
P-1L02	25	GM Detroit Allison (1L)	300 hp	liquid	0.350	0.000	0.000	0.000	**0.001**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
P-1Q02	26	GM Detroit Allison (1Q)	300 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1R02	27	GM Detroit Allison (1R)	300 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	**0.001**
P-1Y02	28	GM Detroit Allison (1Y)	300 hp	liquid	0.350	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	**0.001**
Flares																						
All Flares	29-33	NA	NA	gas	0.063	2.5	2.3	2.6	**7.4**	2.6	2.0	2.0	**6.7**	2.2	2.0	1.7	**5.8**	1.8	2.0	1.4	**5.3**	**25.2**
Incinerators																						
H-250	35	Incinerator	1,300 lb/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-347	36	Incinerator	900 lb/hr	gas		0.1	0.1	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
Other Equipment (Drill Site Heaters)																						
H-1A01	37	Drill Site Heater (1A)	16.40 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-1B01	38	Drill Site Heater (1B)	16.40 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-2V01	39	Drill Site Heater (1C)	14.50 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-3F01	40	Drill Site Heater (1D)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
~~H-1E01~~	~~41~~	~~Drill Site Heater (1E)~~	~~16.40 MMBtu/hr~~	~~gas~~	~~0.005~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
H-1F01	43	Drill Site Heater (1F)	14.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
H-1G01	44	Drill Site Heater (1G)	14.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-1F-1901	45	Drill Site Heater (1H)	16.40 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-1Q01	48	Drill Site Heater (1Q)	21.00 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-1R01	49	Drill Site Heater (1R)	17.20 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-1Y01	50	Drill Site Heater (1Y)	14.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Drill Site 1R Well Injection Engines																						
5010A + 5010B	64 + 65	Detroit Diesel Well Injection Pump	440 hp	liquid	0.112	0.01	0.01	0.01	**0.03**	0.01	0.00	0.00	**0.02**	0.00	0.00	0.00	**0.00**	0.00	0.01	0.00	**0.01**	**0.05**
					Total	5.0	4.6	4.7	**14.3**	4.3	4.1	3.8	**12.1**	4.1	3.8	3.6	**11.6**	4.0	4.2	4.0	**12.2**	**50.2**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type		SO_2 Emission Rate (tons)																
						Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-2101-A	1	GE Frame 3K (MS3002)	16,260 hp	gas		0.8	0.7	0.7	**2.3**	0.7	0.9	0.9	**2.5**	0.9	0.9	0.9	**2.7**	0.9	0.7	0.7	**2.2**	**9.7**
C-2101-B	2	GE Frame 3K (MS3002)	16,260 hp	gas		0.8	0.7	0.7	**2.2**	0.7	0.9	0.8	**2.4**	0.9	0.9	0.9	**2.6**	0.8	0.6	0.6	**2.1**	**9.3**
C-2101-C	3	GE Frame 3K (MS3002)	16,260 hp	gas		0.8	0.7	0.7	**2.2**	0.7	0.9	0.8	**2.4**	0.9	0.9	0.9	**2.7**	0.8	0.6	0.7	**2.2**	**9.4**
G-201-A	4	EGT (Ruston) TB5000	4,900 hp	gas		0.0	0.0	0.0	**0.0**	0.1	0.0	0.0	**0.1**	0.1	0.0	0.1	**0.3**	0.2	0.2	0.2	**0.5**	**1.0**
G-201-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-B	5	EGT (Ruston) TB5000	4,900 hp	gas		0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.0	0.1	**0.2**	0.0	0.1	0.2	**0.2**	**1.6**
G-201-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-C	6	EGT (Ruston) TB5000	4,900 hp	gas		0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.1	**0.5**	0.0	0.0	0.0	**0.1**	**1.7**
G-201-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**		0.000	0.000	0.031	**0.031**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.031**
G-201-D	7	EGT (Ruston) TB5000	4,900 hp	gas		0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.1	**0.5**	**2.2**
G-201-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**		0.000	0.000	0.031	**0.031**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.031**
G-3201-E	8	EGT (Ruston) TB5000	4,900 hp	gas		0.0	0.0	0.0	**0.0**	0.1	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.1	**0.1**	**0.3**
G-3201-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3201-F	9	EGT (Ruston) TB5000	4,900 hp	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-3201-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-2202-A	10	EGT (Ruston) TB5400	5,400 hp	gas		0.2	0.1	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.3	0.2	0.2	**0.7**	0.2	0.2	0.2	**0.6**	**2.5**
P-2202-B	11	EGT (Ruston) TB5400	5,400 hp	gas		0.2	0.1	0.1	**0.5**	0.1	0.2	0.2	**0.5**	0.3	0.1	0.2	**0.6**	0.3	0.2	0.2	**0.6**	**2.2**
P-CL07-A	12	EGT (Ruston) TB5400	5,400 hp	gas		0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.3	0.2	**0.7**	0.2	0.1	0.2	**0.5**	**2.4**
P-CL07-A	**12**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CL07-B	13	EGT (Ruston) TB5400	5,400 hp	gas		0.1	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.6**	0.2	0.3	0.2	**0.7**	0.2	0.1	0.2	**0.5**	**2.2**
P-CL07-B	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3203	14	GE Frame 6 (MS6001B)	53,500 hp	gas		2.3	2.7	2.6	**7.5**	0.9	1.6	1.5	**4.0**	1.5	1.7	1.6	**4.8**	2.2	1.6	2.6	**6.4**	**22.8**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-201	15	Broach	27.80 MMBtu/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-201	**15**	**Broach**	**27.80 MMBtu/hr**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G1-14-01	16	Born Crude Heater	44.40 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.1	0.2	0.2	**0.5**	0.2	0.1	0.1	**0.4**	0.2	0.1	0.1	**0.5**	**1.8**
H-3204	17	Kvaerner process	9.70 MMBtu/hr	gas		0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	**0.2**
H-102A	18	ICE Heater	4.38 MMBtu/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-102A	**18**	**ICE Heater**	**4.38 MMBtu/hr**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-701-A	19	Waukesha	1,086 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-701-B	20	Waukesha	1,086 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment < 600 hp																						
P-CL04-ECC	21	GM Detroit Allison	215 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1A02	22	GM Detroit Allison (1A)	240 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
~~P-1E02~~		~~GM Detroit Allison (1E)~~	~~240 hp~~	~~liquid~~		~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~
P-1F02	23	GM Detroit Allison (1F)	318 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1G02	24	GM Detroit Allison (1G)	318 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1L02	25	GM Detroit Allison (1L)	300 hp	liquid		0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
P-1Q02	26	GM Detroit Allison (1Q)	300 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1R02	27	GM Detroit Allison (1R)	300 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
P-1Y02	28	GM Detroit Allison (1Y)	300 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Flares																						
All Flares	29-33	NA	NA	gas		0.5	0.4	0.5	**1.4**	0.5	0.4	0.4	**1.3**	0.5	0.5	0.4	**1.3**	0.4	0.4	0.3	**1.0**	**5.1**
Incinerators																						
H-250	35	Incinerator	1,300 lb/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-347	36	Incinerator	900 lb/hr	gas		0.1	0.1	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
Other Equipment (Drill Site Heaters)																						
H-1A01	37	Drill Site Heater (1A)	16.40 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.2**	0.0	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-1B01	38	Drill Site Heater (1B)	16.40 MMBtu/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	**0.5**
H-2V01	39	Drill Site Heater (1C)	14.50 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	**0.9**
H-3F01	40	Drill Site Heater (1D)	19.60 MMBtu/hr	gas		0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
~~H-1E01~~	~~41~~	~~Drill Site Heater (1E)~~	~~16.40 MMBtu/hr~~	~~gas~~		~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
H-1F01	43	Drill Site Heater (1F)	14.90 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.1**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	**0.9**
H-1G01	44	Drill Site Heater (1G)	14.90 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	**0.9**
H-1F-1901	45	Drill Site Heater (1H)	16.40 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	**1.1**
H-1Q01	48	Drill Site Heater (1Q)	21.00 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	**1.3**
H-1R01	49	Drill Site Heater (1R)	17.20 MMBtu/hr	gas		0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	**1.1**
H-1Y01	50	Drill Site Heater (1Y)	14.90 MMBtu/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Drill Site 1R Well Injection Engines																						
5010A + 5010B	64 + 65	Detroit Diesel Well Injection Pump	440 hp	liquid		0.01	0.01	0.01	**0.03**	0.01	0.00	0.00	**0.02**	0.00	0.00	0.00	**0.00**	0.00	0.01	0.00	**0.01**	**0.05**
					Total	7.8	7.1	7.4	**22.3**	5.6	7.0	6.6	**19.3**	7.2	7.4	7.1	**21.7**	7.6	5.7	6.8	**20.1**	**83.4**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	PM_{10} EF	PM_{10} Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-2101-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.014	0.8	0.7	0.7	**2.3**	0.8	0.8	0.7	**2.2**	0.7	0.7	0.7	**2.2**	0.7	0.7	0.8	**2.3**	**9.0**
C-2101-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.014	0.8	0.7	0.7	**2.2**	0.7	0.7	0.7	**2.2**	0.7	0.7	0.7	**2.1**	0.7	0.7	0.8	**2.2**	**8.6**
C-2101-C	3	GE Frame 3K (MS3002)	16,260 hp	gas	0.014	0.8	0.7	0.7	**2.2**	0.7	0.7	0.7	**2.2**	0.7	0.7	0.7	**2.1**	0.7	0.7	0.8	**2.2**	**8.7**
G-201-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.007	0.0	0.0	0.0	**0.0**	0.1	0.0	0.0	**0.1**	0.1	0.0	0.0	**0.1**	0.1	0.1	0.1	**0.3**	**0.4**
G-201-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.007	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.0	0.0	**0.1**	0.0	0.0	0.1	**0.1**	**0.8**
G-201-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-201-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.007	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.2**	0.0	0.0	0.0	**0.0**	**0.8**
G-201-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
G-201-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.007	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.2**	**1.0**
G-201-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
G-3201-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.0	0.0	0.0	**0.0**	0.1	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.1	**0.1**	**0.3**
G-3201-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3201-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-3201-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-2202-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.2	0.1	0.2	**0.6**	0.2	0.2	0.1	**0.5**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	**2.3**
P-2202-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.2	0.2	0.1	**0.5**	0.1	0.2	0.1	**0.4**	0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.6**	**2.0**
P-CL07-A	12	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.1	**0.5**	0.2	0.1	0.2	**0.5**	**2.2**
P-CL07-A	**12**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CL07-B	13	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.1	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.6**	0.2	0.1	0.2	**0.5**	**2.1**
P-CL07-B	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-3203	14	GE Frame 6 (MS6001B)	53,500 hp	gas	0.005	0.7	0.7	0.6	**2.0**	0.3	0.6	0.5	**1.4**	0.6	0.5	0.6	**1.6**	0.7	0.6	0.8	**2.0**	**7.1**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-201	15	Broach	27.80 MMBtu/hr	gas	0.007	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-201	**15**	**Broach**	**27.80 MMBtu/hr**	**liquid**	0.007	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G1-14-01	16	Born Crude Heater	44.40 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
H-3204	17	Kvaerner process	9.70 MMBtu/hr	gas	0.007	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
H-102A	18	ICE Heater	4.38 MMBtu/hr	gas	0.007	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-102A	**18**	**ICE Heater**	**4.38 MMBtu/hr**	**liquid**	0.008	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-701-A	19	Waukesha	1,086 hp	liquid	0.100	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-701-B	20	Waukesha	1,086 hp	liquid	0.100	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment < 600 hp																						
P-CL04-ECC	21	GM Detroit Allison	215 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1A02	22	GM Detroit Allison (1A)	240 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
~~P-1E02~~		~~GM Detroit Allison (1E)~~	~~240 hp~~	~~liquid~~	~~0.310~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~
P-1F02	23	GM Detroit Allison (1F)	318 hp	liquid	0.310	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
P-1G02	24	GM Detroit Allison (1G)	318 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	**0.001**
P-1L02	25	GM Detroit Allison (1L)	300 hp	liquid	0.310	0.000	0.000	0.000	**0.001**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
P-1Q02	26	GM Detroit Allison (1Q)	300 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-1R02	27	GM Detroit Allison (1R)	300 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	**0.001**
P-1Y02	28	GM Detroit Allison (1Y)	300 hp	liquid	0.310	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Flares																						
All Flares	29-33	NA	NA	gas	20.0 ug/L	0.4	0.4	0.4	**1.3**	0.5	0.4	0.4	**1.2**	0.4	0.4	0.3	**1.0**	0.3	0.4	0.3	**0.9**	**4.4**
Incinerators																						
H-250	35	Incinerator	1,300 lb/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-347	36	Incinerator	900 lb/hr	gas		0.2	0.2	0.0	**0.3**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.3**
Other Equipment (Drill Site Heaters)																						
H-1A01	37	Drill Site Heater (1A)	16.40 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-1B01	38	Drill Site Heater (1B)	16.40 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
H-2V01	39	Drill Site Heater (1C)	14.50 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-3F01	40	Drill Site Heater (1D)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
~~H-1E01~~	~~41~~	~~Drill Site Heater (1E)~~	~~16.40 MMBtu/hr~~	~~gas~~	~~0.002~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
H-1F01	43	Drill Site Heater (1F)	14.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-1G01	44	Drill Site Heater (1G)	14.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-1F-1901	45	Drill Site Heater (1H)	16.40 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-1Q01	48	Drill Site Heater (1Q)	21.00 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-1R01	49	Drill Site Heater (1R)	17.20 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	**0.2**
H-1Y01	50	Drill Site Heater (1Y)	14.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Drill Site 1R Well Injection Engines																						
5010A + 5010B	64 + 65	Detroit Diesel Well Injection Pump	440 hp	liquid	0.137	0.01	0.01	0.01	**0.04**	0.02	0.00	0.00	**0.02**	0.00	0.00	0.00	**0.00**	0.00	0.01	0.00	**0.01**	**0.06**
					Total	5.0	4.5	4.4	**13.9**	4.4	4.3	3.9	**12.6**	4.3	4.0	4.0	**12.3**	4.3	4.3	4.7	**13.2**	**52.0**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	Actual MMBtu/hr																
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Rig Engines																					
Engines	58	Various	Various	liquid	2.11	0.00	0.00	**0.73**	0.00	0.00	0.07	**0.02**	0.00	0.00	0.00	**0.00**	0.00	0.41	0.00	**0.13**	**0.22**
Boilers and Heaters																					
Boilers/Heaters	59	Various	Various	liquid	3.97	0.00	0.00	**1.37**	0.00	0.00	0.06	**0.02**	0.01	0.00	0.00	**0.00**	0.00	1.62	0.00	**0.53**	**0.48**
Rig Camp Engines																					
Camp Engines	60	Various	Various	liquid	0.19	0.00	0.00	**0.06**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.01	0.00	**0.00**	**0.02**
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																					
Well Service Heaters	61	Various	10.0 MMBtu/hr	liquid	9.65	9.65	9.65	**9.65**	9.65	9.65	9.65	**9.65**	9.65	9.65	9.65	**9.65**	9.65	9.65	9.65	**9.65**	**9.65**
Well Service Engines	62	Various	Various	liquid	5.04	5.04	5.04	**5.04**	5.04	5.04	5.04	**5.04**	5.04	5.04	5.04	**5.04**	5.04	5.04	5.04	**5.04**	**5.04**
Well Frac Unit Engines	63	Various	Various	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
DS1E and DS1J Permanent Operation Equipment																					
H-1E02	42	GTX Energy	30 MMBtu/hr	gas	5.06	3.60	3.85	**4.20**	1.95	1.81	1.57	**1.78**	1.91	2.95	2.71	**2.51**	2.19	1.92	2.86	**2.18**	**2.70**
H-1J01A	46	Petrochem Development	36.8 MMBtu/hr	gas	8.23	8.30	8.24	**8.26**	8.25	8.24	8.25	**8.25**	8.23	8.21	8.15	**8.19**	8.07	8.40	8.21	**8.22**	**8.23**
H-1J01B	47	Petrochem Development	36.8 MMBtu/hr	gas	7.37	7.41	7.46	**7.41**	7.33	7.27	7.21	**7.27**	7.15	7.15	7.15	**7.15**	7.09	7.64	7.45	**7.39**	**7.30**
Portable Flare (PF1)	34	Portable Flare	150 Mscf/day	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	NO_x EF	NO_x Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Rig Engines																						
Engines	58	Various	Various	liquid	3.200	2.508	0.000	0.000	**2.508**	0.000	0.000	0.082	**0.082**	0.000	0.000	0.000	**0.000**	0.000	0.477	0.000	**0.477**	**3.067**
Boilers and Heaters																						
Boilers/Heaters	59	Various	Various	liquid	0.146	0.228	0.000	0.000	**0.228**	0.000	0.000	0.003	**0.003**	0.001	0.000	0.000	**0.001**	0.000	0.090	0.000	**0.090**	**0.322**
Rig Camp Engines																						
Camp Engines	60	Various	Various	liquid	4.410	0.308	0.000	0.000	**0.308**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.019	0.000	**0.019**	**0.327**
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																						
Well Service Heaters	61	Various	10.0 MMBtu/hr	liquid	0.146	0.073	0.034	0.054	**0.161**	0.081	0.020	0.153	**0.254**	0.003	0.069	0.038	**0.110**	0.017	0.127	0.065	**0.209**	**0.733**
Well Service Engines	62	Various	Various	liquid	3.302	0.349	0.158	0.301	**0.807**	0.550	0.326	0.922	**1.797**	0.620	0.997	0.307	**1.925**	0.192	0.414	0.276	**0.882**	**5.411**
Well Frac Unit Engines	63	Various	Various	liquid	1.963	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
DS1E and DS1J Permanent Operation Equipment																						
H-1E02	42	GTX Energy	30 MMBtu/hr	gas	0.098	0.20	0.13	0.15	**0.49**	0.08	0.07	0.06	**0.21**	0.08	0.11	0.10	**0.29**	0.09	0.06	0.03	**0.18**	**1.16**
H-1J01A	46	Petrochem Development	36.8 MMBtu/hr	gas	0.098	0.33	0.30	0.32	**0.95**	0.32	0.33	0.32	**0.97**	0.33	0.32	0.32	**0.97**	0.32	0.32	0.33	**0.97**	**3.86**
H-1J01B	47	Petrochem Development	36.8 MMBtu/hr	gas	0.098	0.30	0.27	0.29	**0.86**	0.28	0.29	0.28	**0.85**	0.29	0.28	0.28	**0.85**	0.28	0.29	0.30	**0.87**	**3.43**
Portable Flare (PF1)	34	Portable Flare	150 Mscf/day	gas	0.068	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**

		Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Turbines MMBtu/hr is based on LHV	**Total**	4.30	0.89	1.12	**6.31**	1.30	1.04	1.82	**4.17**	1.32	1.78	1.04	**4.14**	0.90	1.80	1.00	**3.70**	**18.32**
Heaters MMBtu/hr is based on LHV	**Total excluding NREs**	1.44	0.73	0.82	**2.99**	0.75	0.72	0.82	**2.29**	0.70	0.79	0.74	**2.22**	0.71	0.91	0.73	**2.34**	**9.84**

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Rig Engines																						
Engines	58	Various	Various	liquid	0.850	0.666	0.000	0.000	**0.666**	0.000	0.000	0.022	**0.022**	0.000	0.000	0.000	**0.000**	0.000	0.127	0.000	**0.127**	**0.815**
Boilers and Heaters																						
Boilers/Heaters	59	Various	Various	liquid	0.036	0.057	0.000	0.000	**0.057**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.022	0.000	**0.022**	**0.080**
Rig Camp Engines																						
Camp Engines	60	Various	Various	liquid	0.950	0.066	0.000	0.000	**0.066**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.004	0.000	**0.004**	**0.071**
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																						
Well Service Heaters	61	Various	10.0 MMBtu/hr	liquid	0.036	0.018	0.008	0.013	**0.040**	0.020	0.005	0.038	**0.064**	0.001	0.017	0.009	**0.027**	0.004	0.032	0.016	**0.052**	**0.183**
Well Service Engines	62	Various	Various	liquid	0.858	0.091	0.041	0.078	**0.210**	0.143	0.085	0.240	**0.467**	0.161	0.259	0.080	**0.500**	0.050	0.108	0.072	**0.229**	**1.407**
Well Frac Unit Engines	63	Various	Various	liquid	0.851	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
DS1E and DS1J Permanent Operation Equipment																						
H-1E02	42	GTX Energy	30 MMBtu/hr	gas	0.082	0.17	0.11	0.13	**0.41**	0.06	0.06	0.05	**0.18**	0.06	0.09	0.09	**0.24**	0.07	0.05	0.03	**0.15**	**0.98**
H-1J01A	46	Petrochem Development	36.8 MMBtu/hr	gas	0.082	0.28	0.25	0.27	**0.80**	0.26	0.28	0.27	**0.81**	0.28	0.27	0.27	**0.82**	0.27	0.27	0.28	**0.81**	**3.24**
H-1J01B	47	Petrochem Development	36.8 MMBtu/hr	gas	0.082	0.25	0.23	0.24	**0.72**	0.24	0.25	0.24	**0.72**	0.24	0.24	0.23	**0.71**	0.24	0.24	0.25	**0.73**	**2.88**
Portable Flare (PF1)	34	Portable Flare	150 Mscf/day	gas	0.370	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	1.60	0.64	0.73	**2.97**	0.73	0.68	0.86	**2.26**	0.75	0.88	0.68	**2.30**	0.63	0.86	0.64	**2.13**	**9.66**
Total excluding NREs	0.84	0.60	0.65	**2.09**	0.58	0.59	0.60	**1.77**	0.58	0.62	0.60	**1.80**	0.58	0.62	0.57	**1.78**	**7.44**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Rig Engines																						
Engines	58	Various	Various	liquid	0.082	0.064	0.000	0.000	**0.064**	0.000	0.000	0.002	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.012	0.000	**0.012**	**0.078**
Boilers and Heaters																						
Boilers/Heaters	59	Various	Various	liquid	0.002	0.004	0.000	0.000	**0.004**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.002	0.000	**0.002**	**0.005**
Rig Camp Engines																						
Camp Engines	60	Various	Various	liquid	0.350	0.024	0.000	0.000	**0.024**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	**0.026**
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																						
Well Service Heaters	61	Various	10.0 MMBtu/hr	liquid	0.001	0.001	0.000	0.001	**0.002**	0.001	0.000	0.002	**0.003**	0.000	0.001	0.000	**0.001**	0.000	0.001	0.001	**0.002**	**0.007**
Well Service Engines	62	Various	Various	liquid	0.104	0.011	0.005	0.010	**0.026**	0.017	0.010	0.029	**0.057**	0.020	0.032	0.010	**0.061**	0.006	0.013	0.009	**0.028**	**0.171**
Well Frac Unit Engines	63	Various	Various	liquid	0.084	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
DS1E and DS1J Permanent Operation Equipment																						
H-1E02	42	GTX Energy	30 MMBtu/hr	gas	0.005	0.01	0.01	0.01	**0.03**	0.00	0.00	0.00	**0.01**	0.00	0.01	0.01	**0.02**	0.00	0.00	0.00	**0.01**	**0.06**
H-1J01A	46	Petrochem Development	36.8 MMBtu/hr	gas	0.005	0.02	0.02	0.02	**0.05**	0.02	0.02	0.02	**0.05**	0.02	0.02	0.02	**0.05**	0.02	0.02	0.02	**0.05**	**0.21**
H-1J01B	47	Petrochem Development	36.8 MMBtu/hr	gas	0.005	0.02	0.01	0.02	**0.05**	0.02	0.02	0.02	**0.05**	0.02	0.02	0.02	**0.05**	0.02	0.02	0.02	**0.05**	**0.19**
Portable Flare (PF1)	34	Portable Flare	150 Mscf/day	gas	0.063	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	0.15	0.04	0.05	**0.25**	0.06	0.05	0.07	**0.17**	0.06	0.07	0.05	**0.18**	0.04	0.07	0.05	**0.16**	**0.75**
Total excluding NREs	0.07	0.04	0.04	**0.16**	0.04	0.04	0.04	**0.11**	0.04	0.04	0.04	**0.12**	0.04	0.04	0.04	**0.12**	**0.50**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	SO$_2$ Emission Rate (tons)																	
						Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Rig Engines																						
Engines	58	Various	Various	liquid		2.4E-04	0.0E+00	0.0E+00	**2.4E-04**	0.0E+00	0.0E+00	7.9E-06	**7.9E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	4.6E-05	0.0E+00	**4.6E-05**	**0.000**
Boilers and Heaters																						
Boilers/Heaters	59	Various	Various	liquid		0.155	0.000	0.000	**0.155**	0.000	0.000	0.002	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.082	0.000	**0.082**	**0.240**
Rig Camp Engines																						
Camp Engines	60	Various	Various	liquid		2.2E-05	0.0E+00	0.0E+00	**2.2E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	1.3E-06	0.0E+00	**1.3E-06**	**0.000**
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																						
Well Service Heaters	61	Various	10.0 MMBtu/hr	liquid		0.050	0.023	0.045	**0.117**	0.063	0.016	0.116	**0.196**	0.002	0.053	0.032	**0.087**	0.015	0.116	0.055	**0.186**	**0.585**
Well Service Engines	62	Various	Various	liquid		3.3E-05	1.5E-05	2.8E-05	**7.5E-05**	5.1E-05	3.0E-05	8.6E-05	**1.7E-04**	5.8E-05	9.3E-05	2.9E-05	**1.8E-04**	1.8E-05	3.9E-05	2.6E-05	**8.2E-05**	**0.001**
Well Frac Unit Engines	63	Various	Various	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.000**
DS1E and DS1J Permanent Operation Equipment																						
H-1E02	42	GTX Energy	30 MMBtu/hr	gas		0.03	0.02	0.02	**0.06**	0.01	0.01	0.01	**0.03**	0.01	0.02	0.02	**0.05**	0.01	0.01	0.00	**0.02**	**0.16**
H-1J01A	46	Petrochem Development	36.8 MMBtu/hr	gas		0.04	0.04	0.04	**0.12**	0.04	0.05	0.05	**0.14**	0.05	0.05	0.05	**0.16**	0.05	0.04	0.04	**0.12**	**0.53**
H-1J01B	47	Petrochem Development	36.8 MMBtu/hr	gas		0.04	0.03	0.04	**0.11**	0.03	0.04	0.04	**0.12**	0.04	0.05	0.04	**0.14**	0.04	0.03	0.03	**0.11**	**0.47**
Portable Flare (PF1)	34	Portable Flare	150 Mscf/day	gas		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Turbines MMBtu/hr is based on LHV					**Total**	0.31	0.11	0.14	**0.56**	0.14	0.12	0.22	**0.48**	0.11	0.17	0.14	**0.43**	0.12	0.27	0.13	**0.52**	**1.99**
Heaters MMBtu/hr is based on LHV					**Total excluding NREs**	0.31	0.11	0.14	**0.56**	0.14	0.12	0.22	**0.48**	0.11	0.17	0.14	**0.43**	0.12	0.27	0.13	**0.52**	**1.99**

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	PM_{10} EF	PM_{10} Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Rig Engines																						
Engines	58	Various	Various	liquid	0.100	0.078	0.000	0.000	**0.078**	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.015	0.000	**0.015**	**0.096**
Boilers and Heaters																						
Boilers/Heaters	59	Various	Various	liquid	0.008	0.012	0.000	0.000	**0.012**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.005	0.000	**0.005**	**0.017**
Rig Camp Engines																						
Camp Engines	60	Various	Various	liquid	0.310	0.022	0.000	0.000	**0.022**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	**0.023**
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																						
Well Service Heaters	61	Various	10.0 MMBtu/hr	liquid	0.007	0.004	0.002	0.003	**0.008**	0.004	0.001	0.008	**0.013**	0.000	0.003	0.002	**0.005**	0.001	0.006	0.003	**0.010**	**0.037**
Well Service Engines	62	Various	Various	liquid	0.118	0.012	0.006	0.011	**0.029**	0.020	0.012	0.033	**0.064**	0.022	0.036	0.011	**0.069**	0.007	0.015	0.010	**0.031**	**0.193**
Well Frac Unit Engines	63	Various	Various	liquid	0.062	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
DS1E and DS1J Permanent Operation Equipment																						
H-1E02	42	GTX Energy	30 MMBtu/hr	gas	0.007	0.02	0.01	0.01	**0.04**	0.01	0.01	0.00	**0.02**	0.01	0.01	0.01	**0.02**	0.01	0.00	0.00	**0.01**	**0.09**
H-1J01A	46	Petrochem Development	36.8 MMBtu/hr	gas	0.007	0.03	0.02	0.02	**0.07**	0.02	0.03	0.02	**0.07**	0.03	0.02	0.02	**0.07**	0.02	0.02	0.03	**0.07**	**0.29**
H-1J01B	47	Petrochem Development	36.8 MMBtu/hr	gas	0.007	0.02	0.02	0.02	**0.07**	0.02	0.02	0.02	**0.06**	0.02	0.02	0.02	**0.06**	0.02	0.02	0.02	**0.07**	**0.26**
Portable Flare (PF1)	34	Portable Flare	150 Mscf/day	gas	20.000	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	0.19	0.06	0.07	**0.32**	0.07	0.07	0.09	**0.23**	0.08	0.09	0.07	**0.23**	0.06	0.09	0.06	**0.22**	**1.01**
Total excluding NREs	0.10	0.05	0.06	**0.22**	0.06	0.05	0.06	**0.17**	0.05	0.06	0.05	**0.17**	0.05	0.06	0.05	**0.17**	**0.72**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	Actual MMBtu/hr																
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Gas Turbines																					
C2-101-A	1	GE Frame 3J (MS3002)	15,140 hp	gas	164.17	0.00	163.93	**164.01**	157.29	147.73	142.09	**149.81**	138.70	142.39	142.00	**141.12**	146.07	149.11	158.03	**151.09**	**149.78**
C2-101-B	2	GE Frame 3J (MS3002)	15,140 hp	gas	158.40	164.57	154.78	**161.53**	148.94	145.02	139.79	**143.56**	135.44	140.17	140.20	**138.83**	144.38	148.42	157.98	**150.28**	**147.45**
C2-101-C	3	GE Frame 3J (MS3002)	15,140 hp	gas	177.84	186.25	182.95	**182.54**	173.21	158.24	156.75	**165.50**	148.98	153.08	153.42	**152.07**	158.30	164.00	176.50	**166.29**	**166.68**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	gas	39.48	41.64	40.22	**40.41**	40.89	33.57	33.77	**37.02**	40.20	35.32	37.26	**37.62**	36.45	44.27	37.82	**38.62**	**38.51**
G-4202-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	gas	40.79	43.46	41.85	**41.99**	43.12	33.47	34.18	**37.00**	42.96	37.01	39.08	**39.40**	38.36	39.61	40.65	**39.54**	**39.50**
G-4202-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	gas	33.76	42.85	40.23	**40.00**	42.25	33.71	33.84	**35.56**	40.91	36.38	38.74	**39.91**	35.63	37.92	38.83	**38.11**	**37.84**
G-4202-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	gas	40.45	41.62	39.61	**40.78**	42.23	34.76	34.73	**37.46**	41.27	35.60	38.56	**39.08**	38.04	38.93	40.36	**39.11**	**39.01**
G-4202-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	47.94	**47.94**	0.00	47.94	47.94	**47.94**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**47.94**
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	3.26	0.00	**3.26**	0.00	0.00	0.00	**0.00**	**3.26**
G-4202-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	gas	39.68	41.98	41.09	**40.88**	42.23	33.31	34.33	**36.59**	40.80	36.62	37.97	**38.47**	37.58	38.51	39.90	**38.66**	**38.64**
G-4202-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
P-CM02-A	10	EGT (Ruston) TB5400	5,400 hp	gas	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	**49.72**
P-CM02-B	11	EGT (Ruston) TB5400	5,400 hp	gas	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	**49.72**
P-CM02-C	12	EGT (Ruston) TB5400	5,400 hp	gas	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	**49.72**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	gas	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	49.72	49.72	49.72	**49.72**	**49.72**
P-CM02-D	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Gas-Fired Heaters (Excluding Drill Site Heaters)																					
H-4201	14	Broach	27.8 MMBtu/hr	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
H-4201	**14**	**Broach**	**27.8 MMBtu/hr**	**liquid**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Diesel-Fired Equipment > 600 hp																					
G-4201-A	15	Waukesha	1,086 hp	liquid	7.45	7.49	7.49	**7.47**	7.41	7.49	7.49	**7.47**	0.00	7.45	7.49	**7.47**	7.45	0.00	7.45	**7.45**	**7.46**
G-4201-B	16	Waukesha	1,086 hp	liquid	7.45	7.49	7.45	**7.46**	7.41	7.45	7.41	**7.43**	0.00	7.45	7.49	**7.47**	7.41	0.00	7.43	**7.42**	**7.45**
Diesel-Fired Equipment < 600 hp																					
P-4205	17	GM Detroit Allison	235 hp	liquid	1.61	1.62	1.61	**1.61**	1.61	1.61	1.61	**1.61**	1.62	1.62	1.61	**1.61**	1.61	1.61	1.61	**1.61**	**1.61**
P-CM04	18	GM Detroit Allison	215 hp	liquid	1.61	1.61	1.61	**1.61**	1.62	1.61	1.61	**1.61**	1.61	1.61	1.61	**1.61**	1.62	1.62	1.61	**1.62**	**1.61**
Pumps	19-29	GM Detroit Allison	300 hp (each)	liquid	2.06	2.06	2.06	**2.06**	2.06	2.06	2.06	**2.06**	2.06	2.06	2.06	**2.06**	0.00	2.06	2.06	**2.06**	**2.06**
Flares																					
All Flares	30-32	NA	NA	gas	30.18	29.90	36.83	**32.38**	37.72	45.08	30.73	**37.92**	36.43	40.48	39.79	**38.87**	33.82	33.31	36.06	**34.47**	**35.95**
Other Equipment (Drill Site Heaters)																					
H-2A01	33	Drill Site Heater (2T-Tabasco)	14.9 MMBtu/hr	gas	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	**14.66**
H-2B01	34	Drill Site Heater (2B)	15.4 MMBtu/hr	gas	15.20	15.20	15.20	**15.20**	15.20	15.20	15.20	**15.20**	15.20	15.20	15.20	**15.20**	15.20	15.20	15.20	**15.20**	**15.20**
H-2C01	35	Drill Site Heater (2C)	14.9 MMBtu/hr	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	14.66	14.66	**14.66**	**14.66**
H-2D01	36	Drill Site Heater (2D)	14.5 MMBtu/hr	gas	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	**14.33**
H-2E01	37	Drill Site Heater (2E)	3.0 MMBtu/hr	gas	2.93	2.93	2.93	**2.93**	2.93	2.93	2.93	**2.93**	2.93	2.93	2.93	**2.93**	2.93	2.93	2.93	**2.93**	**2.93**
H-2F01	38	Drill Site Heater (2F)	14.5 MMBtu/hr	gas	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	**14.33**
H-2G01	39	Drill Site Heater (2G)	14.5 MMBtu/hr	gas	0.00	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	14.33	14.33	14.33	**14.33**	**14.33**
H-2H01	40	Drill Site Heater (2H)	14.9 MMBtu/hr	gas	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	**14.66**
H-K04-01	41	Drill Site Heater (2K)	19.8 MMBtu/hr	gas	19.54	19.54	19.54	**19.54**	19.54	19.54	19.54	**19.54**	19.54	19.54	19.54	**19.54**	19.54	19.54	19.54	**19.54**	**19.54**
H-K05-01	42	Drill Site Heater (2M)	19.8 MMBtu/hr	gas	19.54	19.54	19.54	**19.54**	19.54	19.54	19.54	**19.54**	19.54	19.54	19.54	**19.54**	19.54	19.54	19.54	**19.54**	**19.54**
H-3M01	43	Drill Site Heater (2T)	19.5 MMBtu/hr	gas	19.22	19.22	19.22	**19.22**	19.22	19.22	19.22	**19.22**	19.22	19.22	19.22	**19.22**	19.22	19.22	19.22	**19.22**	**19.22**
H-2U01	44	Drill Site Heater (2U)	14.9 MMBtu/hr	gas	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	14.66	14.66	14.66	**14.66**	**14.66**
H-2W01	45	Drill Site Heater (2W)	23.9 MMBtu/hr	gas	23.56	23.56	23.56	**23.56**	23.56	23.56	23.56	**23.56**	23.56	23.56	23.56	**23.56**	23.56	23.56	23.56	**23.56**	**23.56**
H-2X01	46	Drill Site Heater (2X)	19.4 MMBtu/hr	gas	19.11	19.11	19.11	**19.11**	19.11	19.11	19.11	**19.11**	19.11	19.11	19.11	**19.11**	19.11	19.11	19.11	**19.11**	**19.11**
H-2Z01	47	Drill Site Heater (2Z)	19.4 MMBtu/hr	gas	0.00	0.00	0.00	**0.00**	0.00	19.11	0.00	**19.11**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**19.11**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	NO_x EF lb/MMBtu	NO_x Emission Rate (tons) Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C2-101-A	1	GE Frame 3J (MS3002)	15,140 hp	gas	0.535	16.4	0.0	30.6	**47.0**	30.2	12.2	23.2	**65.6**	24.1	28.3	26.7	**79.2**	29.1	28.8	31.5	**89.3**	**281.1**
C2-101-B	2	GE Frame 3J (MS3002)	15,140 hp	gas	0.535	22.1	29.6	2.5	**54.2**	14.3	21.2	26.9	**62.3**	21.2	27.9	26.8	**75.9**	28.7	28.6	31.4	**88.8**	**281.3**
C2-101-C	3	GE Frame 3J (MS3002)	15,140 hp	gas	0.535	28.3	33.5	36.4	**98.1**	33.4	26.8	4.6	**64.8**	21.9	30.5	29.1	**81.5**	31.5	31.6	35.1	**98.3**	**342.6**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.2	4.0	4.3	**12.5**	4.2	2.6	1.4	**8.2**	4.3	3.6	3.8	**11.8**	3.9	1.8	0.2	**5.9**	**38.3**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	liquid	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.3	4.2	4.4	**13.0**	4.4	3.6	3.1	**11.1**	3.4	3.9	3.9	**11.3**	4.1	4.1	4.3	**12.5**	**47.8**
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	liquid	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.286	0.3	0.4	3.1	**3.8**	2.2	3.6	3.0	**8.8**	4.4	1.0	0.4	**5.7**	0.9	3.2	4.1	**8.2**	**26.5**
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	liquid	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.3	3.6	1.2	**9.1**	4.3	3.7	2.6	**10.7**	3.5	1.3	4.0	**8.8**	4.0	4.0	4.3	**12.4**	**40.9**
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	liquid	0.880	0.000	0.000	0.094	0.094	0.000	0.008	0.005	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.108
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.286	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	liquid	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.286	4.2	4.0	4.4	**12.6**	4.3	3.5	3.5	**11.4**	4.3	3.9	3.9	**12.1**	4.0	4.0	4.2	**12.2**	**48.4**
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	liquid	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-CM02-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.328	6.1	5.5	6.0	**17.6**	5.9	6.1	5.9	**17.8**	6.1	6.1	5.4	**17.5**	6.1	5.9	6.1	**18.0**	**70.9**
P-CM02-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.328	6.1	5.5	6.1	**17.6**	5.9	6.1	5.9	**17.8**	6.1	6.1	5.2	**17.3**	6.1	5.9	6.1	**18.0**	**70.7**
P-CM02-C	12	EGT (Ruston) TB5400	5,400 hp	gas	0.328	6.1	5.5	6.1	**17.6**	5.9	6.1	5.9	**17.8**	6.0	6.1	5.1	**17.2**	5.7	5.9	6.1	**17.7**	**70.2**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	gas	0.328	5.9	5.5	6.1	**17.5**	5.2	5.8	5.9	**16.9**	6.1	6.1	5.1	**17.3**	6.1	5.8	6.1	**18.0**	**69.6**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	liquid	0.880	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-4201	14	Broach	27.8 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-4201	14	Broach	27.8 MMBtu/hr	liquid	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Diesel-Fired Equipment > 600 hp																						
G-4201-A	15	Waukesha	1,086 hp	liquid	3.200	0.021	0.007	0.007	**0.035**	0.008	0.007	0.007	**0.022**	0.000	0.006	0.007	**0.013**	0.009	0.000	0.024	**0.033**	**0.102**
G-4201-B	16	Waukesha	1,086 hp	liquid	3.200	0.021	0.007	0.006	**0.034**	0.008	0.009	0.008	**0.025**	0.000	0.015	0.007	**0.022**	0.008	0.000	0.014	**0.022**	**0.102**
Diesel-Fired Equipment < 600 hp																						
P-4205	17	GM Detroit Allison	235 hp	liquid	4.410	0.004	0.006	0.007	**0.017**	0.007	0.007	0.012	**0.025**	0.006	0.005	0.005	**0.015**	0.007	0.007	0.007	**0.021**	**0.078**
P-CM04	18	GM Detroit Allison	215 hp	liquid	4.410	0.002	0.004	0.002	**0.008**	0.004	0.001	0.004	**0.009**	0.006	0.002	0.006	**0.015**	0.003	0.008	0.004	**0.015**	**0.046**
Pumps	19-29	GM Detroit Allison	300 hp (each)	liquid	4.410	0.011	0.011	0.022	**0.045**	0.007	0.032	0.004	**0.043**	0.003	0.009	0.005	**0.017**	0.000	0.005	0.101	**0.106**	**0.210**
Flares																						
All Flares	30-32	NA	NA	gas	0.068	0.8	0.7	0.9	**2.4**	0.9	1.1	0.8	**2.8**	0.9	1.0	0.9	**2.9**	0.6	0.8	0.9	**2.3**	**10.4**
Other Equipment (Drill Site Heaters)																						
H-2A01	33	Drill Site Heater (2T-Tabasco)	14.9 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	**7.1**
H-2B01	34	Drill Site Heater (2B)	15.4 MMBtu/hr	gas	0.100	0.6	0.6	0.6	**1.8**	0.5	0.6	0.5	**1.7**	0.6	0.6	0.6	**1.9**	0.6	0.6	0.6	**1.8**	**7.2**
H-2C01	35	Drill Site Heater (2C)	14.9 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.5	**0.5**	**0.5**
H-2D01	36	Drill Site Heater (2D)	14.5 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.5	0.6	0.6	**1.7**	0.6	0.6	0.6	**1.7**	0.6	0.6	0.6	**1.7**	**6.9**
H-2E01	37	Drill Site Heater (2E)	3.0 MMBtu/hr	gas	0.100	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	0.0	0.1	0.1	**0.2**	**1.3**
H-2F01	38	Drill Site Heater (2F)	14.5 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.6	0.6	**1.7**	0.6	0.6	0.6	**1.7**	0.6	0.5	0.6	**1.7**	**6.9**
H-2G01	39	Drill Site Heater (2G)	14.5 MMBtu/hr	gas	0.100	0.0	0.4	0.6	**0.9**	0.6	0.6	0.6	**1.7**	0.6	0.6	0.6	**1.7**	0.6	0.6	0.6	**1.7**	**6.2**
H-2H01	40	Drill Site Heater (2H)	14.9 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	**7.1**
H-K04-01	41	Drill Site Heater (2K)	19.8 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.4**
H-K05-01	42	Drill Site Heater (2M)	19.8 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.4**
H-3M01	43	Drill Site Heater (2T)	19.5 MMBtu/hr	gas	0.100	0.6	0.7	0.8	**2.1**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.3**	**9.1**
H-2U01	44	Drill Site Heater (2U)	14.9 MMBtu/hr	gas	0.100	0.6	0.5	0.6	**1.7**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	0.6	0.6	0.6	**1.8**	**7.0**
H-2W01	45	Drill Site Heater (2W)	23.9 MMBtu/hr	gas	0.100	1.0	0.9	1.0	**2.8**	0.9	1.0	0.9	**2.8**	0.9	1.0	0.9	**2.8**	1.0	0.9	0.9	**2.8**	**11.3**
H-2X01	46	Drill Site Heater (2X)	19.4 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.7	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.3**	**9.2**
H-2Z01	47	Drill Site Heater (2Z)	19.4 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
					Total	116.8	109.3	120.6	**346.8**	129.2	110.8	100.7	**340.7**	120.6	134.2	128.6	**383.4**	139.1	138.5	149.4	**427.0**	**1,497.9**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C2-101-A	1	GE Frame 3J (MS3002)	15,140 hp	gas	0.009	0.3	0.0	0.5	**0.8**	0.5	0.2	0.4	**1.1**	0.4	0.5	0.4	**1.3**	0.5	0.5	0.5	**1.5**	**4.7**
C2-101-B	2	GE Frame 3J (MS3002)	15,140 hp	gas	0.009	0.4	0.5	0.0	**0.9**	0.2	0.4	0.5	**1.0**	0.4	0.5	0.5	**1.3**	0.5	0.5	0.5	**1.5**	**4.7**
C2-101-C	3	GE Frame 3J (MS3002)	15,140 hp	gas	0.009	0.5	0.6	0.6	**1.7**	0.6	0.5	0.1	**1.1**	0.4	0.5	0.5	**1.4**	0.5	0.5	0.6	**1.7**	**5.8**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.4	0.4	**1.2**	0.4	0.2	0.1	**0.8**	0.4	0.3	0.4	**1.1**	0.4	0.2	0.0	**0.6**	**3.6**
G-4202-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.4	0.4	**1.2**	0.4	0.3	0.3	**1.0**	0.3	0.4	0.4	**1.1**	0.4	0.4	0.4	**1.2**	**4.5**
G-4202-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.0	0.0	0.3	**0.4**	0.2	0.3	0.3	**0.8**	0.4	0.1	0.0	**0.5**	0.1	0.3	0.4	**0.8**	**2.5**
G-4202-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.3	0.1	**0.9**	0.4	0.3	0.2	**1.0**	0.3	0.1	0.4	**0.8**	0.4	0.4	0.4	**1.2**	**3.9**
G-4202-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-4202-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.4	0.4	0.4	**1.2**	0.4	0.3	0.3	**1.1**	0.4	0.4	0.4	**1.1**	0.4	0.4	0.4	**1.2**	**4.6**
G-4202-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CM02-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.7	0.6	0.7	**2.0**	0.7	0.7	0.7	**2.0**	0.7	0.7	0.6	**2.0**	0.7	0.7	0.7	**2.0**	**8.0**
P-CM02-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.7	0.6	0.7	**2.0**	0.7	0.7	0.7	**2.0**	0.7	0.7	0.6	**2.0**	0.7	0.7	0.7	**2.0**	**8.0**
P-CM02-C	12	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.7	0.6	0.7	**2.0**	0.7	0.7	0.7	**2.0**	0.7	0.7	0.6	**1.9**	0.6	0.7	0.7	**2.0**	**7.9**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.7	0.6	0.7	**2.0**	0.6	0.7	0.7	**1.9**	0.7	0.7	0.6	**1.9**	0.7	0.7	0.7	**2.0**	**7.9**
P-CM02-D	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.003	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-4201	14	Broach	27.8 MMBtu/hr	gas	0.018	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-4201	**14**	**Broach**	**27.8 MMBtu/hr**	**liquid**	0.036	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-4201-A	15	Waukesha	1,086 hp	liquid	0.850	0.006	0.002	0.002	**0.009**	0.002	0.002	0.002	**0.006**	0.000	0.002	0.002	**0.003**	0.002	0.000	0.006	**0.009**	**0.027**
G-4201-B	16	Waukesha	1,086 hp	liquid	0.850	0.006	0.002	0.002	**0.009**	0.002	0.002	0.002	**0.007**	0.000	0.004	0.002	**0.006**	0.002	0.000	0.004	**0.006**	**0.027**
Diesel-Fired Equipment < 600 hp																						
P-4205	17	GM Detroit Allison	235 hp	liquid	0.950	0.001	0.001	0.001	**0.004**	0.001	0.001	0.002	**0.005**	0.001	0.001	0.001	**0.003**	0.002	0.002	0.001	**0.005**	**0.017**
P-CM04	18	GM Detroit Allison	215 hp	liquid	0.950	0.000	0.001	0.001	**0.002**	0.001	0.000	0.001	**0.002**	0.001	0.001	0.001	**0.003**	0.001	0.002	0.001	**0.003**	**0.010**
Pumps	19-29	GM Detroit Allison	300 hp (each)	liquid	0.950	0.002	0.002	0.005	**0.010**	0.001	0.007	0.001	**0.009**	0.001	0.002	0.001	**0.004**	0.000	0.001	0.022	**0.023**	**0.045**
Flares																						
All Flares	30-32	NA	NA	gas	0.370	4.2	3.7	5.1	**12.9**	5.0	6.2	4.1	**15.3**	5.0	5.6	4.9	**15.5**	3.3	4.4	5.0	**12.7**	**56.5**
Other Equipment (Drill Site Heaters)																						
H-2A01	33	Drill Site Heater (2T-Tabasco)	14.9 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.3**
H-2B01	34	Drill Site Heater (2B)	15.4 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.3**
H-2C01	35	Drill Site Heater (2C)	14.9 MMBtu/hr	gas	0.018	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.1	**0.1**	**0.1**
H-2D01	36	Drill Site Heater (2D)	14.5 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-2E01	37	Drill Site Heater (2E)	3.0 MMBtu/hr	gas	0.018	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	**0.2**
H-2F01	38	Drill Site Heater (2F)	14.5 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-2G01	39	Drill Site Heater (2G)	14.5 MMBtu/hr	gas	0.018	0.0	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.1**
H-2H01	40	Drill Site Heater (2H)	14.9 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.3**
H-K04-01	41	Drill Site Heater (2K)	19.8 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-K05-01	42	Drill Site Heater (2M)	19.8 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-3M01	43	Drill Site Heater (2T)	19.5 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.6**
H-2U01	44	Drill Site Heater (2U)	14.9 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.3**
H-2W01	45	Drill Site Heater (2W)	23.9 MMBtu/hr	gas	0.018	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.5**	**2.0**
H-2X01	46	Drill Site Heater (2X)	19.4 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-2Z01	47	Drill Site Heater (2Z)	19.4 MMBtu/hr	gas	0.018	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
					Total	11.0	10.1	12.1	**33.3**	12.2	13.1	10.4	**35.7**	12.3	12.6	11.7	**36.5**	10.6	11.7	12.6	**34.9**	**140.4**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C2-101-A	1	GE Frame 3J (MS3002)	15,140 hp	gas	0.002	0.1	0.0	0.1	**0.2**	0.1	0.0	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	**1.1**
C2-101-B	2	GE Frame 3J (MS3002)	15,140 hp	gas	0.002	0.1	0.1	0.0	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.1**
C2-101-C	3	GE Frame 3J (MS3002)	15,140 hp	gas	0.002	0.1	0.1	0.1	**0.4**	0.1	0.1	0.0	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	**1.3**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	**0.3**
G-4202-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
G-4202-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	**0.2**
G-4202-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
G-4202-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-4202-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
G-4202-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CM02-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
P-CM02-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
P-CM02-C	12	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
P-CM02-D	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-4201	14	Broach	27.8 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-4201	**14**	**Broach**	**27.8 MMBtu/hr**	**liquid**	0.001	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-4201-A	15	Waukesha	1,086 hp	liquid	0.082	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	**0.003**
G-4201-B	16	Waukesha	1,086 hp	liquid	0.082	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	**0.003**
Diesel-Fired Equipment < 600 hp																						
P-4205	17	GM Detroit Allison	235 hp	liquid	0.350	0.000	0.000	0.001	**0.001**	0.001	0.001	0.001	**0.002**	0.000	0.000	0.000	**0.001**	0.001	0.001	0.001	**0.002**	**0.006**
P-CM04	18	GM Detroit Allison	215 hp	liquid	0.350	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.001	0.000	**0.001**	**0.004**
Pumps	19-29	GM Detroit Allison	300 hp (each)	liquid	0.350	0.001	0.001	0.002	**0.004**	0.001	0.003	0.000	**0.003**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.008	**0.008**	**0.017**
Flares																						
All Flares	30-32	NA	NA	gas	0.063	0.7	0.6	0.9	**2.2**	0.9	1.1	0.7	**2.6**	0.9	0.9	0.8	**2.6**	0.6	0.8	0.8	**2.2**	**9.6**
Other Equipment (Drill Site Heaters)																						
H-2A01	33	Drill Site Heater (2T-Tabasco)	14.9 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-2B01	34	Drill Site Heater (2B)	15.4 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-2C01	35	Drill Site Heater (2C)	14.9 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-2D01	36	Drill Site Heater (2D)	14.5 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-2E01	37	Drill Site Heater (2E)	3.0 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
H-2F01	38	Drill Site Heater (2F)	14.5 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-2G01	39	Drill Site Heater (2G)	14.5 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
H-2H01	40	Drill Site Heater (2H)	14.9 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-K04-01	41	Drill Site Heater (2K)	19.8 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-K05-01	42	Drill Site Heater (2M)	19.8 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-3M01	43	Drill Site Heater (2T)	19.5 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-2U01	44	Drill Site Heater (2U)	14.9 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-2W01	45	Drill Site Heater (2W)	23.9 MMBtu/hr	gas	0.005	0.1	0.0	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.0	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.2**	**0.6**
H-2X01	46	Drill Site Heater (2X)	19.4 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-2Z01	47	Drill Site Heater (2Z)	19.4 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
					Total	1.7	1.5	1.9	**5.1**	1.9	2.0	1.6	**5.5**	1.9	2.0	1.9	**5.7**	1.6	1.8	2.0	**5.5**	**21.8**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	SO$_2$ Emission Rate (tons) Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																					
C2-101-A	1	GE Frame 3J (MS3002)	15,140 hp	gas	0.5	0.0	0.9	**1.4**	0.8	0.3	0.7	**1.8**	0.6	0.8	0.6	**2.0**	0.7	0.7	0.7	**2.2**	**7.3**
C2-101-B	2	GE Frame 3J (MS3002)	15,140 hp	gas	0.6	0.9	0.1	**1.6**	0.4	0.6	0.8	**1.7**	0.5	0.8	0.6	**1.9**	0.7	0.7	0.7	**2.2**	**7.4**
C2-101-C	3	GE Frame 3J (MS3002)	15,140 hp	gas	0.8	1.0	1.1	**2.8**	0.8	0.7	0.1	**1.7**	0.5	0.9	0.7	**2.1**	0.8	0.8	0.8	**2.4**	**9.0**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.2	0.2	0.2	**0.7**	0.2	0.1	0.1	**0.4**	0.2	0.2	0.2	**0.6**	0.2	0.1	0.0	**0.3**	**1.9**
G-4202-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.2	0.2	0.2	**0.7**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.6**	**2.4**
G-4202-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.0	0.0	0.2	**0.2**	0.1	0.2	0.2	**0.5**	0.2	0.1	0.0	**0.3**	0.0	0.1	0.2	**0.4**	**1.3**
G-4202-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.2	0.2	0.1	**0.5**	0.2	0.2	0.1	**0.5**	0.2	0.1	0.2	**0.4**	0.2	0.2	0.2	**0.6**	**2.0**
G-4202-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.014	**0.014**	0.000	0.001	0.001	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.016**
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-4202-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.2	0.2	0.2	**0.7**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	**2.4**
G-4202-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CM02-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.3	0.3	0.3	**0.8**	0.2	0.3	0.3	**0.8**	0.2	0.3	0.2	**0.7**	0.3	0.2	0.2	**0.7**	**3.1**
P-CM02-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.3	0.3	0.3	**0.8**	0.2	0.3	0.3	**0.8**	0.2	0.3	0.2	**0.7**	0.3	0.2	0.2	**0.7**	**3.1**
P-CM02-C	12	EGT (Ruston) TB5400	5,400 hp	gas	0.3	0.3	0.3	**0.8**	0.2	0.3	0.3	**0.8**	0.2	0.3	0.2	**0.7**	0.2	0.2	0.2	**0.7**	**3.0**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	gas	0.3	0.3	0.3	**0.8**	0.2	0.3	0.3	**0.8**	0.2	0.3	0.2	**0.7**	0.3	0.2	0.2	**0.7**	**3.0**
P-CM02-D	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																					
H-4201	14	Broach	27.8 MMBtu/hr	gas	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-4201	**14**	**Broach**	**27.8 MMBtu/hr**	**liquid**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																					
G-4201-A	15	Waukesha	1,086 hp	liquid	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	**0.004**
G-4201-B	16	Waukesha	1,086 hp	liquid	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.001	**0.001**	**0.004**
Diesel-Fired Equipment < 600 hp																					
P-4205	17	GM Detroit Allison	235 hp	liquid	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	**0.002**
P-CM04	18	GM Detroit Allison	215 hp	liquid	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Pumps	19-29	GM Detroit Allison	300 hp (each)	liquid	0.000	0.000	0.001	**0.001**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.003	**0.003**	**0.006**
Flares																					
All Flares	30-32	NA	NA	gas	0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.2	**0.4**	**2.0**
Other Equipment (Drill Site Heaters)																					
H-2A01	33	Drill Site Heater (2T-Tabasco)	14.9 MMBtu/hr	gas	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-2B01	34	Drill Site Heater (2B)	15.4 MMBtu/hr	gas	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-2C01	35	Drill Site Heater (2C)	14.9 MMBtu/hr	gas	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.1	**0.1**	**0.1**
H-2D01	36	Drill Site Heater (2D)	14.5 MMBtu/hr	gas	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-2E01	37	Drill Site Heater (2E)	3.0 MMBtu/hr	gas	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2F01	38	Drill Site Heater (2F)	14.5 MMBtu/hr	gas	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-2G01	39	Drill Site Heater (2G)	14.5 MMBtu/hr	gas	0.0	0.1	0.1	**0.1**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.8**
H-2H01	40	Drill Site Heater (2H)	14.9 MMBtu/hr	gas	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-K04-01	41	Drill Site Heater (2K)	19.8 MMBtu/hr	gas	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-K05-01	42	Drill Site Heater (2M)	19.8 MMBtu/hr	gas	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-3M01	43	Drill Site Heater (2T)	19.5 MMBtu/hr	gas	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-2U01	44	Drill Site Heater (2U)	14.9 MMBtu/hr	gas	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
H-2W01	45	Drill Site Heater (2W)	23.9 MMBtu/hr	gas	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.5**
H-2X01	46	Drill Site Heater (2X)	19.4 MMBtu/hr	gas	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
H-2Z01	47	Drill Site Heater (2Z)	19.4 MMBtu/hr	gas	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
				Total	5.3	4.9	5.5	**15.7**	5.0	5.0	4.7	**14.8**	4.7	5.7	4.4	**14.9**	5.3	4.9	5.1	**15.3**	**60.6**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	PM_{10} EF	PM_{10} Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C2-101-A	1	GE Frame 3J (MS3002)	15,140 hp	gas	0.014	0.4	0.0	0.8	**1.2**	0.8	0.3	0.6	**1.7**	0.6	0.7	0.7	**2.0**	0.7	0.7	0.8	**2.3**	**7.2**
C2-101-B	2	GE Frame 3J (MS3002)	15,140 hp	gas	0.014	0.6	0.8	0.1	**1.4**	0.4	0.5	0.7	**1.6**	0.5	0.7	0.7	**1.9**	0.7	0.7	0.8	**2.3**	**7.2**
C2-101-C	3	GE Frame 3J (MS3002)	15,140 hp	gas	0.014	0.7	0.9	0.9	**2.5**	0.9	0.7	0.1	**1.7**	0.6	0.8	0.7	**2.1**	0.8	0.8	0.9	**2.5**	**8.8**
G-4202-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.2	0.2	0.2	**0.6**	0.2	0.1	0.1	**0.4**	0.2	0.2	0.2	**0.6**	0.2	0.1	0.0	**0.3**	**1.8**
G-4202-A	**4**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-B	5	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.2	0.2	0.2	**0.6**	0.2	0.2	0.1	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.6**	**2.3**
G-4202-B	**5**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-C	6	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.0	0.0	0.1	**0.2**	0.1	0.2	0.1	**0.4**	0.2	0.0	0.0	**0.3**	0.0	0.2	0.2	**0.4**	**1.3**
G-4202-C	**6**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-D	7	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.2	0.2	0.1	**0.4**	0.2	0.2	0.1	**0.5**	0.2	0.1	0.2	**0.4**	0.2	0.2	0.2	**0.6**	**2.0**
G-4202-D	**7**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
G-4202-E	8	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
G-4202-E	**8**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
G-4202-F	9	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	**2.3**
G-4202-F	**9**	**EGT (Ruston) TB5000**	**4,900 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
P-CM02-A	10	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.3	0.2	0.3	**0.7**	0.2	0.3	0.2	**0.7**	0.3	0.3	0.2	**0.7**	0.3	0.2	0.3	**0.8**	**3.0**
P-CM02-B	11	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.3	0.2	0.3	**0.7**	0.2	0.3	0.2	**0.7**	0.3	0.3	0.2	**0.7**	0.3	0.2	0.3	**0.8**	**3.0**
P-CM02-C	12	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.3	0.2	0.3	**0.7**	0.2	0.3	0.2	**0.7**	0.2	0.3	0.2	**0.7**	0.2	0.2	0.3	**0.7**	**2.9**
P-CM02-D	13	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.2	0.2	0.3	**0.7**	0.2	0.2	0.2	**0.7**	0.3	0.3	0.2	**0.7**	0.3	0.2	0.3	**0.8**	**2.9**
P-CM02-D	**13**	**EGT (Ruston) TB5400**	**5,400 hp**	**liquid**	0.012	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-4201	14	Broach	27.8 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-4201	**14**	**Broach**	**27.8 MMBtu/hr**	**liquid**	0.007	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Diesel-Fired Equipment > 600 hp																						
G-4201-A	15	Waukesha	1,086 hp	liquid	0.100	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	**0.003**
G-4201-B	16	Waukesha	1,086 hp	liquid	0.100	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	**0.003**
Diesel-Fired Equipment < 600 hp																						
P-4205	17	GM Detroit Allison	235 hp	liquid	0.310	0.000	0.000	0.000	**0.001**	0.000	0.000	0.001	**0.002**	0.000	0.000	0.000	**0.001**	0.001	0.001	0.000	**0.001**	**0.006**
P-CM04	18	GM Detroit Allison	215 hp	liquid	0.310	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.001	0.000	**0.001**	**0.003**
Pumps	19-29	GM Detroit Allison	300 hp (each)	liquid	0.310	0.001	0.001	0.002	**0.003**	0.000	0.002	0.000	**0.003**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.007	**0.007**	**0.015**
Flares																						
All Flares	30-32	NA	NA	gas	20.0 ug/L	0.1	0.1	0.2	**0.4**	0.1	0.2	0.1	**0.5**	0.1	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.7**
Other Equipment (Drill Site Heaters)																						
H-2A01	33	Drill Site Heater (2T-Tabasco)	14.9 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2B01	34	Drill Site Heater (2B)	15.4 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2C01	35	Drill Site Heater (2C)	14.9 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-2D01	36	Drill Site Heater (2D)	14.5 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2E01	37	Drill Site Heater (2E)	3.0 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-2F01	38	Drill Site Heater (2F)	14.5 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2G01	39	Drill Site Heater (2G)	14.5 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2H01	40	Drill Site Heater (2H)	14.9 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-K04-01	41	Drill Site Heater (2K)	19.8 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-K05-01	42	Drill Site Heater (2M)	19.8 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3M01	43	Drill Site Heater (2T)	19.5 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-2U01	44	Drill Site Heater (2U)	14.9 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-2W01	45	Drill Site Heater (2W)	23.9 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
H-2X01	46	Drill Site Heater (2X)	19.4 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-2Z01	47	Drill Site Heater (2Z)	19.4 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
					Total	3.9	3.6	4.0	**11.5**	4.2	3.8	3.4	**11.4**	4.0	4.3	4.1	**12.4**	4.4	4.4	4.7	**13.6**	**48.8**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	Actual MMBtu/hr															
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Gas Turbines																					
C-EF01-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	151.46	153.76	154.31	**153.07**	149.57	141.32	138.24	**143.17**	139.15	138.98	140.62	**139.57**	145.70	152.62	156.77	**151.71**	**146.68**
C-EF01-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	149.88	158.08	152.71	**153.27**	148.34	140.63	137.84	**142.42**	137.48	137.26	139.55	**138.08**	144.36	151.95	152.90	**149.43**	**145.52**
G-EF01-A	3	EGT (Ruston) TB5000	4,900 hp	gas	11.92	12.91	29.89	**13.10**	35.67	15.92	12.16	**35.28**	37.99	38.91	22.83	**35.81**	10.01	33.16	14.11	**22.26**	**27.85**
P-EF52-A	4	EGT (Ruston) TB5000	4,900 hp	gas	46.91	47.19	42.68	**45.66**	43.03	42.78	41.28	**42.33**	41.92	42.34	43.94	**42.74**	44.21	43.29	44.15	**43.89**	**43.73**
P-EF52-B	5	EGT (Ruston) TB5400	5,400 hp	gas	44.28	44.11	44.22	**44.21**	41.30	39.74	39.08	**39.89**	39.25	39.88	40.94	**39.99**	41.34	42.08	43.58	**42.34**	**41.71**
G-EF03	6	GE Frame 5	35,400 hp	gas	260.02	259.80	278.29	**266.23**	263.18	274.84	264.31	**267.55**	254.70	264.21	257.27	**259.94**	257.00	264.44	254.07	**258.44**	**263.24**
Dual-Fuel Fired Heaters																					
H-EF03	7	Broach	48.50 MMBtu/hr	gas	4.34	0.00	0.00	**13.03**	0.00	0.00	8.94	**8.94**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**8.99**
H-EF03	**7**	**Broach**	**48.50 MMBtu/hr**	**liquid**	**1.99**	0.00	0.00	**1.99**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**1.99**
Gas-Fired Heaters (Excluding Drill Site Heaters)																					
H-EF04	8	Howe-Baker	5.60 MMBtu/hr	gas	3.09	2.96	2.77	**2.94**	2.62	2.64	2.25	**2.50**	2.13	2.15	2.16	**2.16**	2.36	2.34	2.13	**2.27**	**2.49**
Diesel-Fired Equipment < 600 hp																					
P-EF24B	9	Caterpillar	430 hp	liquid	2.96	2.96	2.96	**2.96**	2.96	2.96	2.96	**2.96**	2.96	2.96	2.96	**2.96**	2.96	0.00	2.96	**2.96**	**2.96**
P-EF53	10	GM Detroit Allison	270 hp	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Flares																					
All Flares	11-14	NA	NA	gas	27.67	28.63	33.02	**29.81**	29.23	27.55	29.51	**28.75**	25.18	27.48	29.07	**27.23**	6.86	31.85	36.52	**23.90**	**27.53**
Other Equipment (Drill Site Heaters)																					
H-3A01	15	Drill Site Heater (3A)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-3B01	16	Drill Site Heater (3B)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-3C01	17	Drill Site Heater (3C)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-K06-01	18	Drill Site Heater (3G)	19.90 MMBtu/hr	gas	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	**19.65**
H-K02-01	19	Drill Site Heater (3H)	19.90 MMBtu/hr	gas	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	**19.65**
H-3I01	20	Drill Site Heater (3I)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-3J01	21	Drill Site Heater (3J)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-3K01	22	Drill Site Heater (3K)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-K01-01	23	Drill Site Heater (3M)	19.90 MMBtu/hr	gas	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	**19.65**
H-3N01	24	Drill Site Heater (3N)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-K03-01	25	Drill Site Heater (3O)	19.90 MMBtu/hr	gas	19.65	19.65	19.65	**19.65**	19.65	19.65	19.65	**19.65**	19.65	19.65	0.00	**19.65**	19.65	19.65	19.65	**19.65**	**19.65**
H-3Q01	26	Drill Site Heater (3Q)	19.60 MMBtu/hr	gas	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	19.32	19.32	19.32	**19.32**	**19.32**
H-K07-01	27	Drill Site Heater (3R)	20 hp	gas	6.00	6.19	5.91	**6.03**	5.67	5.38	5.00	**5.37**	5.51	5.57	7.96	**6.07**	14.92	6.06	6.50	**8.16**	**6.37**
Diesel-Fired Equipment < 600 hp																					
PED-4005	43	Cummins KT-1150-G	465 hp	liquid	0.00	0.00	0.00	**0.00**	2.33	0.00	0.00	**2.33**	2.33	0.00	0.00	**2.33**	0.00	0.00	0.00	**0.00**	**2.33**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	NO_x EF	NO_x Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-EF01-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.358	20.2	11.2	20.5	**51.9**	19.3	18.8	16.2	**54.3**	18.5	18.5	18.1	**55.2**	19.2	19.7	20.9	**59.7**	**221.1**
C-EF01-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.358	20.0	17.2	20.3	**57.5**	19.1	18.7	15.8	**53.6**	18.3	18.3	18.0	**54.6**	17.2	8.5	20.4	**46.0**	**211.7**
G-EF01-A	3	EGT (Ruston) TB5000	4,900 hp	gas	0.286	0.6	0.1	0.1	**0.8**	1.7	0.0	0.0	**1.7**	3.1	0.4	0.4	**3.8**	0.2	1.0	0.2	**1.4**	**7.7**
P-EF52-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.286	5.0	4.5	4.0	**13.5**	3.0	4.5	3.8	**11.3**	3.2	4.1	3.7	**10.9**	4.7	4.4	4.7	**13.7**	**49.4**
P-EF52-B	5	EGT (Ruston) TB5400	5,400 hp	gas	0.328	5.4	4.9	5.4	**15.6**	2.7	4.8	3.6	**11.1**	4.6	4.9	4.4	**13.9**	5.0	5.0	5.3	**15.3**	**55.9**
G-EF03	6	GE Frame 5	35,400 hp	gas	0.321	31.0	28.0	33.1	**92.2**	30.0	32.8	30.5	**93.4**	7.7	28.6	29.4	**65.8**	30.7	30.6	30.3	**91.6**	**343.0**
Dual-Fuel Fired Heaters																						
H-EF03	7	Broach	48.50 MMBtu/hr	gas	0.100	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-EF03	**7**	**Broach**	**48.50 MMBtu/hr**	**liquid**	0.146	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-EF04	8	Howe-Baker	5.60 MMBtu/hr	gas	0.100	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.0	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	**1.1**
Diesel-Fired Equipment < 600 hp																						
P-EF24B	9	Caterpillar	430 hp	liquid	4.410	0.021	0.005	0.015	**0.041**	0.008	0.005	0.003	**0.016**	0.002	0.011	0.005	**0.018**	0.002	0.000	0.007	**0.008**	**0.083**
P-EF53	10	GM Detroit Allison	270 hp	liquid	4.410	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Flares																						
All Flares	11-14	NA	NA	gas	0.068	0.7	0.7	0.8	**2.2**	0.7	0.7	0.7	**2.1**	0.6	0.7	0.7	**2.0**	0.2	0.8	0.6	**1.5**	**7.9**
Other Equipment (Drill Site Heaters)																						
H-3A01	15	Drill Site Heater (3A)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.3**
H-3B01	16	Drill Site Heater (3B)	19.60 MMBtu/hr	gas	0.100	0.4	0.4	0.4	**1.2**	0.4	0.5	0.8	**1.7**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**7.5**
H-3C01	17	Drill Site Heater (3C)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.4**	**9.3**
H-K06-01	18	Drill Site Heater (3G)	19.90 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.5**
H-K02-01	19	Drill Site Heater (3H)	19.90 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.4**
H-3I01	20	Drill Site Heater (3I)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.3**
H-3J01	21	Drill Site Heater (3J)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.3**
H-3K01	22	Drill Site Heater (3K)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.7	**2.2**	0.8	0.7	0.7	**2.2**	0.7	0.8	0.8	**2.2**	**8.9**
H-K01-01	23	Drill Site Heater (3M)	19.90 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.7	**2.3**	0.8	0.8	0.8	**2.4**	0.8	0.8	0.8	**2.4**	**9.5**
H-3N01	24	Drill Site Heater (3N)	19.60 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.8	**2.3**	0.7	0.8	0.8	**2.3**	0.8	0.8	0.8	**2.4**	**9.3**
H-K03-01	25	Drill Site Heater (3O)	19.90 MMBtu/hr	gas	0.100	0.8	0.7	0.8	**2.3**	0.8	0.8	0.7	**2.3**	0.8	0.6	0.0	**1.4**	0.2	0.5	0.8	**1.5**	**7.5**
H-3Q01	26	Drill Site Heater (3Q)	19.60 MMBtu/hr	gas	0.100	0.8	0.6	0.4	**1.9**	0.8	0.8	0.7	**2.2**	0.8	0.7	0.6	**2.1**	0.6	0.8	0.8	**2.2**	**8.4**
H-K07-01	27	Drill Site Heater (3R)	20 hp	gas	0.100	0.2	0.2	0.2	**0.7**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.3	0.2	0.3	**0.8**	**2.8**
Diesel-Fired Equipment < 600 hp																						
PED-4005	43	Cummins KT-1150-G	465 hp	liquid	4.410	0.000	0.000	0.000	**0.000**	0.015	0.000	0.000	**0.015**	0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	**0.018**
					Total	92.4	75.2	93.4	**261.0**	85.7	90.0	79.8	**255.6**	65.8	84.9	83.2	**233.9**	86.1	79.2	92.3	**257.7**	**1,008.1**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-EF01-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.020	1.1	0.6	1.1	**2.9**	1.1	1.1	0.9	**3.0**	1.0	1.0	1.0	**3.1**	1.1	1.1	1.2	**3.3**	**12.4**
C-EF01-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.020	1.1	1.0	1.1	**3.2**	1.1	1.0	0.9	**3.0**	1.0	1.0	1.0	**3.0**	1.0	0.5	1.1	**2.6**	**11.8**
G-EF01-A	3	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.1	0.0	0.0	**0.1**	0.2	0.0	0.0	**0.2**	0.3	0.0	0.0	**0.4**	0.0	0.1	0.0	**0.1**	**0.7**
P-EF52-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.5	0.4	0.4	**1.3**	0.3	0.4	0.4	**1.1**	0.3	0.4	0.3	**1.0**	0.4	0.4	0.4	**1.3**	**4.7**
P-EF52-B	5	EGT (Ruston) TB5400	5,400 hp	gas	0.037	0.6	0.5	0.6	**1.8**	0.3	0.5	0.4	**1.3**	0.5	0.5	0.5	**1.6**	0.6	0.6	0.6	**1.7**	**6.3**
G-EF03	6	GE Frame 5	35,400 hp	gas	0.433	41.9	37.8	44.7	**124.4**	40.5	44.3	41.2	**126.0**	10.4	38.6	39.7	**88.7**	41.4	41.3	40.9	**123.6**	**462.6**
Dual-Fuel Fired Heaters																						
H-EF03	7	Broach	48.50 MMBtu/hr	gas	0.082	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-EF03	**7**	**Broach**	**48.50 MMBtu/hr**	**liquid**	0.036	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-EF04	8	Howe-Baker	5.60 MMBtu/hr	gas	0.082	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.0	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
Diesel-Fired Equipment < 600 hp																						
P-EF24B	9	Caterpillar	430 hp	liquid	0.950	0.005	0.001	0.003	**0.009**	0.002	0.001	0.001	**0.004**	0.000	0.002	0.001	**0.004**	0.000	0.000	0.001	**0.002**	**0.018**
P-EF53	10	GM Detroit Allison	270 hp	liquid	0.950	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Flares																						
All Flares	11-14	NA	NA	gas	0.370	3.8	3.6	4.5	**11.9**	3.9	3.8	3.9	**11.6**	3.5	3.8	3.9	**11.1**	0.9	4.2	3.3	**8.4**	**43.1**
Other Equipment (Drill Site Heaters)																						
H-3A01	15	Drill Site Heater (3A)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-3B01	16	Drill Site Heater (3B)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.4**
H-3C01	17	Drill Site Heater (3C)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-K06-01	18	Drill Site Heater (3G)	19.90 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-K02-01	19	Drill Site Heater (3H)	19.90 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-3I01	20	Drill Site Heater (3I)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-3J01	21	Drill Site Heater (3J)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-3K01	22	Drill Site Heater (3K)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.6**
H-K01-01	23	Drill Site Heater (3M)	19.90 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-3N01	24	Drill Site Heater (3N)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-K03-01	25	Drill Site Heater (3O)	19.90 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.0	**0.3**	0.0	0.1	0.1	**0.3**	**1.3**
H-3Q01	26	Drill Site Heater (3Q)	19.60 MMBtu/hr	gas	0.018	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.5**
H-K07-01	27	Drill Site Heater (3R)	20 hp	gas	0.018	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.1	0.0	0.0	**0.2**	**0.5**
Diesel-Fired Equipment < 600 hp																						
PED-4005	43	Cummins KT-1150-G	465 hp	liquid	0.950	0.000	0.000	0.000	**0.000**	0.003	0.000	0.000	**0.003**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	**0.004**

Total	50.9	45.5	54.2	**150.6**	49.0	52.9	49.4	**151.3**	18.8	47.2	48.1	**114.0**	47.0	49.9	49.4	**146.4**	**562.4**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-EF01-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.002	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	**1.3**
C-EF01-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.002	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.0	0.1	**0.3**	**1.2**
G-EF01-A	3	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
P-EF52-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
P-EF52-B	5	EGT (Ruston) TB5400	5,400 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
G-EF03	6	GE Frame 5	35,400 hp	gas	0.002	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.1	0.2	0.2	**0.4**	0.2	0.2	0.2	**0.6**	**2.2**
Dual-Fuel Fired Heaters																						
H-EF03	7	Broach	48.50 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-EF03	**7**	**Broach**	**48.50 MMBtu/hr**	**liquid**	0.002	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-EF04	8	Howe-Baker	5.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
Diesel-Fired Equipment < 600 hp																						
P-EF24B	9	Caterpillar	430 hp	liquid	0.350	0.002	0.000	0.001	**0.003**	0.001	0.000	0.000	**0.001**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.001	**0.001**	**0.007**
P-EF53	10	GM Detroit Allison	270 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Flares																						
All Flares	11-14	NA	NA	gas	0.063	0.6	0.6	0.8	**2.0**	0.7	0.6	0.7	**2.0**	0.6	0.6	0.7	**1.9**	0.2	0.7	0.6	**1.4**	7.3
Other Equipment (Drill Site Heaters)																						
H-3A01	15	Drill Site Heater (3A)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-3B01	16	Drill Site Heater (3B)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-3C01	17	Drill Site Heater (3C)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-K06-01	18	Drill Site Heater (3G)	19.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-K02-01	19	Drill Site Heater (3H)	19.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-3I01	20	Drill Site Heater (3I)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-3J01	21	Drill Site Heater (3J)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-3K01	22	Drill Site Heater (3K)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-K01-01	23	Drill Site Heater (3M)	19.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-3N01	24	Drill Site Heater (3N)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-K03-01	25	Drill Site Heater (3O)	19.90 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.4**
H-3Q01	26	Drill Site Heater (3Q)	19.60 MMBtu/hr	gas	0.005	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.5**
H-K07-01	27	Drill Site Heater (3R)	20 hp	gas	0.005	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
Diesel-Fired Equipment < 600 hp																						
PED-4005	43	Cummins KT-1150-G	465 hp	liquid	0.350	0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	0.000	**0.000**	0.000	0.000	**0.000**	**0.001**
					Total	1.7	1.5	1.8	**5.0**	1.6	1.7	1.6	**4.9**	1.5	1.6	1.6	**4.7**	1.1	1.7	1.6	**4.4**	**18.9**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type		SO_2 Emission Rate (tons)																
						Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-EF01-A	1	GE Frame 3K (MS3002)	16,260 hp	gas		1.2	0.7	1.4	**3.3**	1.3	1.2	1.0	**3.5**	1.1	1.2	1.0	**3.3**	1.0	1.0	0.9	**3.0**	**13.1**
C-EF01-B	2	GE Frame 3K (MS3002)	16,260 hp	gas		1.2	1.1	1.4	**3.6**	1.3	1.2	1.0	**3.5**	1.1	1.2	1.0	**3.3**	0.9	0.4	0.9	**2.2**	**12.6**
G-EF01-A	3	EGT (Ruston) TB5000	4,900 hp	gas		0.0	0.0	0.0	**0.1**	0.1	0.0	0.0	**0.1**	0.2	0.0	0.0	**0.3**	0.0	0.1	0.0	**0.1**	**0.6**
P-EF52-A	4	EGT (Ruston) TB5000	4,900 hp	gas		0.4	0.4	0.3	**1.1**	0.3	0.4	0.3	**0.9**	0.2	0.3	0.3	**0.8**	0.3	0.3	0.3	**0.9**	**3.6**
P-EF52-B	5	EGT (Ruston) TB5400	5,400 hp	gas		0.3	0.3	0.4	**1.1**	0.2	0.3	0.3	**0.8**	0.3	0.3	0.3	**0.9**	0.3	0.3	0.3	**0.8**	**3.6**
G-EF03	6	GE Frame 5	35,400 hp	gas		2.0	2.0	2.5	**6.5**	2.3	2.3	2.2	**6.7**	0.5	2.1	1.8	**4.4**	1.8	1.8	1.5	**5.1**	**22.7**
Dual-Fuel Fired Heaters																						
H-EF03	7	Broach	48.50 MMBtu/hr	gas		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-EF03	**7**	**Broach**	**48.50 MMBtu/hr**	**liquid**		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-EF04	8	Howe-Baker	5.60 MMBtu/hr	gas		0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
Diesel-Fired Equipment < 600 hp																						
P-EF24B	9	Caterpillar	430 hp	liquid		0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
P-EF53	10	GM Detroit Allison	270 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Flares																						
All Flares	11-14	NA	NA	gas		0.2	0.2	0.3	**0.7**	0.2	0.2	0.2	**0.7**	0.2	0.2	0.2	**0.6**	0.0	0.2	0.1	**0.4**	**2.3**
Other Equipment (Drill Site Heaters)																						
H-3A01	15	Drill Site Heater (3A)	19.60 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-3B01	16	Drill Site Heater (3B)	19.60 MMBtu/hr	gas		0.1	0.1	0.1	**0.2**	0.1	0.1	0.2	**0.3**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.4**
H-3C01	17	Drill Site Heater (3C)	19.60 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-K06-01	18	Drill Site Heater (3G)	19.90 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-K02-01	19	Drill Site Heater (3H)	19.90 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-3I01	20	Drill Site Heater (3I)	19.60 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-3J01	21	Drill Site Heater (3J)	19.60 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-3K01	22	Drill Site Heater (3K)	19.60 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.2	0.2	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.7**
H-K01-01	23	Drill Site Heater (3M)	19.90 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.1	0.1	0.1	**0.4**	**1.8**
H-3N01	24	Drill Site Heater (3N)	19.60 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.1	0.2	0.1	**0.4**	0.1	0.1	0.1	**0.4**	**1.8**
H-K03-01	25	Drill Site Heater (3O)	19.90 MMBtu/hr	gas		0.2	0.1	0.2	**0.5**	0.2	0.2	0.1	**0.5**	0.2	0.1	0.0	**0.3**	0.0	0.1	0.1	**0.2**	**1.5**
H-3Q01	26	Drill Site Heater (3Q)	19.60 MMBtu/hr	gas		0.2	0.1	0.1	**0.4**	0.2	0.2	0.1	**0.5**	0.2	0.2	0.1	**0.4**	0.1	0.1	0.1	**0.3**	**1.6**
H-K07-01	27	Drill Site Heater (3R)	20 hp	gas		0.0	0.0	0.1	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.1	0.0	0.0	**0.1**	**0.5**
Diesel-Fired Equipment < 600 hp																						
PED-4005	43	Cummins KT-1150-G	465 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
					Total	7.1	6.4	8.3	**21.8**	7.8	7.5	6.9	**22.1**	5.5	7.4	6.1	**19.0**	5.9	5.6	5.4	**16.9**	**79.9**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	PM_{10} EF	PM_{10} Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
C-EF01-A	1	GE Frame 3K (MS3002)	16,260 hp	gas	0.014	0.8	0.4	0.8	**2.0**	0.7	0.7	0.6	**2.1**	0.7	0.7	0.7	**2.1**	0.7	0.8	0.8	**2.3**	**8.5**
C-EF01-B	2	GE Frame 3K (MS3002)	16,260 hp	gas	0.014	0.8	0.7	0.8	**2.2**	0.7	0.7	0.6	**2.1**	0.7	0.7	0.7	**2.1**	0.7	0.3	0.8	**1.8**	**8.1**
G-EF01-A	3	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.0	0.0	0.0	**0.0**	0.1	0.0	0.0	**0.1**	0.1	0.0	0.0	**0.2**	0.0	0.0	0.0	**0.1**	**0.4**
P-EF52-A	4	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.2	0.2	0.2	**0.6**	0.1	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.7**	**2.4**
P-EF52-B	5	EGT (Ruston) TB5400	5,400 hp	gas	0.014	0.2	0.2	0.2	**0.7**	0.1	0.2	0.2	**0.5**	0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	**2.3**
G-EF03	6	GE Frame 5	35,400 hp	gas	0.014	1.3	1.2	1.4	**3.9**	1.3	1.4	1.3	**4.0**	0.3	1.2	1.3	**2.8**	1.3	1.3	1.3	**3.9**	**14.7**
Dual-Fuel Fired Heaters																						
H-EF03	7	Broach	48.50 MMBtu/hr	gas	0.007	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
H-EF03	**7**	**Broach**	**48.50 MMBtu/hr**	**liquid**	0.008	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Gas-Fired Heaters (Excluding Drill Site Heaters)																						
H-EF04	8	Howe-Baker	5.60 MMBtu/hr	gas	0.007	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
Diesel-Fired Equipment < 600 hp																						
P-EF24B	9	Caterpillar	430 hp	liquid	0.310	0.001	0.000	0.001	**0.003**	0.001	0.000	0.000	**0.001**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.001**	**0.006**
P-EF53	10	GM Detroit Allison	270 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Flares																						
All Flares	11-14	NA	NA	gas	20.0 ug/L	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.0	0.1	0.1	**0.3**	**1.3**
Other Equipment (Drill Site Heaters)																						
H-3A01	15	Drill Site Heater (3A)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3B01	16	Drill Site Heater (3B)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3C01	17	Drill Site Heater (3C)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-K06-01	18	Drill Site Heater (3G)	19.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-K02-01	19	Drill Site Heater (3H)	19.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3I01	20	Drill Site Heater (3I)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3J01	21	Drill Site Heater (3J)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3K01	22	Drill Site Heater (3K)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-K01-01	23	Drill Site Heater (3M)	19.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-3N01	24	Drill Site Heater (3N)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-K03-01	25	Drill Site Heater (3O)	19.90 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.2**
H-3Q01	26	Drill Site Heater (3Q)	19.60 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.2**
H-K07-01	27	Drill Site Heater (3R)	20 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
Diesel-Fired Equipment < 600 hp																						
PED-4005	43	Cummins KT-1150-G	465 hp	liquid	0.310	0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
					Total	3.7	3.0	3.8	**10.5**	3.4	3.6	3.2	**10.3**	2.6	3.4	3.3	**9.3**	3.4	3.2	3.7	**10.3**	**40.4**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	Actual MMBtu/hr																
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Gas Turbines																					
G-CJ33-A	1	EGT (Ruston) TB5000	4,900 hp	gas	27.38	30.53	29.86	**29.17**	33.05	30.89	29.63	**30.99**	31.20	31.81	30.24	**31.07**	31.07	33.51	32.90	**31.86**	30.58
G-CJ33-B	2	EGT (Ruston) TB5000	4,900 hp	gas	30.70	30.51	29.17	**30.02**	34.82	33.12	31.18	**34.08**	33.55	14.91	35.52	**30.40**	30.40	36.05	34.23	**34.20**	32.39
Gas-Fired Heaters																					
H-CJ31-A	3	John Zink Utility Heater	90.00 MMBtu/hr	gas	45.03	47.18	41.58	**44.51**	31.41	28.12	35.10	**30.19**	24.38	20.11	0.00	**22.81**	42.89	46.61	53.83	**48.30**	38.62
H-CJ31-B	4	John Zink Utility Heater	90.00 MMBtu/hr	gas	45.03	47.18	41.58	**44.51**	31.41	28.12	35.10	**31.34**	24.38	20.11	43.52	**34.33**	42.89	46.61	53.83	**47.80**	40.42
H-CJ31-C	5	John Zink Utility Heater	90.00 MMBtu/hr	gas	45.03	47.18	41.58	**44.51**	31.41	28.12	35.10	**31.44**	24.38	20.11	43.52	**31.60**	42.89	46.61	53.83	**47.80**	39.69
Diesel-Fired Equipment																					
G-CJ35 (Removed)	6	Waukesha	1,006 hp	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00
P-CK31A	7	GM Detroit Allison	99 hp	liquid	0.68	0.68	0.68	**0.68**	0.00	0.68	0.68	**0.68**	0.68	0.00	0.68	**0.68**	0.68	0.00	0.68	**0.68**	0.68

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	NO_x EF	NO_x Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
G-CJ33-A	1	EGT (Ruston) TB5000	4,900 hp	gas	0.286	2.8	2.8	2.5	**8.0**	2.4	2.1	3.1	**7.5**	3.3	2.0	2.2	**7.4**	1.2	1.7	1.4	**4.2**	27.1
G-CJ33-B	2	EGT (Ruston) TB5000	4,900 hp	gas	0.286	3.0	0.9	2.7	**6.6**	3.6	1.3	0.4	**5.3**	2.7	0.3	0.6	**3.7**	2.8	2.9	3.6	**9.5**	25.1
Gas-Fired Heaters																						
H-CJ31-A	3	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.061	1.1	1.1	1.0	**3.2**	0.8	0.7	0.2	**1.6**	0.6	0.3	0.0	**0.9**	0.8	1.1	1.3	**3.3**	9.0
H-CJ31-B	4	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.061	1.1	1.1	1.0	**3.2**	0.8	0.7	0.7	**2.2**	0.1	0.2	0.9	**1.2**	1.1	1.1	1.3	**3.5**	10.1
H-CJ31-C	5	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.061	1.1	1.1	1.0	**3.2**	0.7	0.7	0.8	**2.3**	0.4	0.2	0.8	**1.4**	1.1	1.1	1.3	**3.5**	10.4
Diesel-Fired Equipment																						
G-CJ35 (Removed)	6	Waukesha	1,006 hp	liquid	3.200	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000
P-CK31A	7	GM Detroit Allison	99 hp	liquid	4.410	0.003	0.001	0.034	**0.039**	0.000	0.001	0.001	**0.002**	0.001	0.000	0.001	**0.003**	0.000	0.000	0.017	**0.018**	0.062
					Total	9.2	6.8	8.4	**24.4**	8.2	5.5	5.2	**18.9**	7.2	3.0	4.5	**14.6**	6.9	8.0	9.1	**24.1**	**81.9**

Turbines MMBtu/hr is based on LHV

Heaters MMBtu/hr is based on LHV

All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
G-CJ33-A	1	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.3	0.3	0.2	**0.8**	0.2	0.2	0.3	**0.7**	0.3	0.2	0.2	**0.7**	0.1	0.2	0.1	**0.4**	2.6
G-CJ33-B	2	EGT (Ruston) TB5000	4,900 hp	gas	0.027	0.3	0.1	0.3	**0.6**	0.3	0.1	0.0	**0.5**	0.3	0.0	0.1	**0.4**	0.3	0.3	0.3	**0.9**	2.4
Gas-Fired Heaters																						
H-CJ31-A	3	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.003	0.1	0.1	0.1	**0.2**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.1	0.1	**0.2**	0.4
H-CJ31-B	4	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.003	0.1	0.1	0.1	**0.2**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.1	0.1	0.1	**0.2**	0.5
H-CJ31-C	5	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.003	0.1	0.1	0.1	**0.2**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.1	0.1	0.1	**0.2**	0.5
Diesel-Fired Equipment																						
G-CJ35 (Removed)	6	Waukesha	1,006 hp	liquid	0.850	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000
P-CK31A	7	GM Detroit Allison	99 hp	liquid	0.950	0.001	0.000	0.007	**0.008**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.004	**0.004**	0.013

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	0.7	0.5	0.7	**1.9**	0.7	0.4	0.4	**1.5**	0.6	0.3	0.3	**1.2**	0.5	0.6	0.7	**1.8**	**6.4**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
G-CJ33-A	1	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.2
G-CJ33-B	2	EGT (Ruston) TB5000	4,900 hp	gas	0.002	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.2
Gas-Fired Heaters																						
H-CJ31-A	3	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.005	0.1	0.1	0.1	**0.3**	0.1	0.1	0.0	**0.1**	0.1	0.0	0.0	**0.1**	0.1	0.1	0.1	**0.3**	0.8
H-CJ31-B	4	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.005	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.0	0.0	0.1	**0.1**	0.1	0.1	0.1	**0.3**	0.9
H-CJ31-C	5	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.005	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.0	0.0	0.1	**0.1**	0.1	0.1	0.1	**0.3**	0.9
Diesel-Fired Equipment																						
G-CJ35 (Removed)	6	Waukesha	1,006 hp	liquid	0.082	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000
P-CK31A	7	GM Detroit Allison	99 hp	liquid	0.350	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	0.005
					Total	0.3	0.3	0.3	**1.0**	0.2	0.2	0.2	**0.6**	0.1	0.1	0.2	**0.4**	0.3	0.3	0.4	**1.0**	**3.0**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	SO_2 Emission Rate (tons)																	
						Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
G-CJ33-A	1	EGT (Ruston) TB5000	4,900 hp	gas		0.2	0.2	0.2	**0.6**	0.2	0.2	0.2	**0.6**	0.3	0.1	0.2	**0.6**	0.1	0.1	0.1	**0.3**	2.0
G-CJ33-B	2	EGT (Ruston) TB5000	4,900 hp	gas		0.2	0.1	0.2	**0.5**	0.3	0.1	0.0	**0.4**	0.2	0.0	0.0	**0.3**	0.2	0.2	0.2	**0.6**	1.8
Gas-Fired Heaters																						
H-CJ31-A	3	John Zink Utility Heater	90.00 MMBtu/hr	gas		0.1	0.1	0.1	**0.4**	0.1	0.1	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.1	0.1	0.1	**0.3**	0.9
H-CJ31-B	4	John Zink Utility Heater	90.00 MMBtu/hr	gas		0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.2**	0.0	0.0	0.0	**0.0**	0.1	0.1	0.1	**0.4**	1.0
H-CJ31-C	5	John Zink Utility Heater	90.00 MMBtu/hr	gas		0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.2**	0.0	0.0	0.0	**0.0**	0.1	0.1	0.1	**0.4**	1.0
Diesel-Fired Equipment																						
G-CJ35 (Removed)	6	Waukesha	1,006 hp	liquid		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000
P-CK31A	7	GM Detroit Allison	99 hp	liquid		0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.002

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	0.8	0.6	0.8	**2.2**	0.8	0.5	0.4	**1.7**	0.5	0.2	0.2	**1.0**	0.5	0.7	0.7	**1.9**	**6.8**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufacturer / Model	Rating	Fuel Type	PM_{10} EF	PM_{10} Emission Rate (tons)																
					lb/MMBtu	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																						
G-CJ33-A	1	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.2	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.2**	1.3
G-CJ33-B	2	EGT (Ruston) TB5000	4,900 hp	gas	0.014	0.1	0.0	0.1	**0.3**	0.2	0.1	0.0	**0.3**	0.1	0.0	0.0	**0.2**	0.1	0.1	0.2	**0.5**	1.2
Gas-Fired Heaters																						
H-CJ31-A	3	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.1	**0.1**	0.4
H-CJ31-B	4	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.1	**0.1**	0.4
H-CJ31-C	5	John Zink Utility Heater	90.00 MMBtu/hr	gas	0.002	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.1	**0.1**	0.4
Diesel-Fired Equipment																						
G-CJ35 (Removed)	6	Waukesha	1,006 hp	liquid	0.100	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000
P-CK31A	7	GM Detroit Allison	99 hp	liquid	0.310	0.000	0.000	0.002	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	0.004
					Total	0.4	0.3	0.4	**1.1**	0.4	0.2	0.2	**0.9**	0.3	0.1	0.2	**0.7**	0.3	0.4	0.4	**1.1**	**3.7**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Kuparuk River Unit
Portable Equipment Inventory - Heaters PTE

Emission Unit ID	Emission Unit Description	Manufacturer	Model	Heat Input Rating	Fuel Type	Total MMBTUs	Estimated Fuel Use	Maximum Operation	Potential Emissions (tpy) NO_X	CO	PM_{10}	SO_2	VOC
SDH035	Heater	Totem	10	0.84 MMBtu/hr	diesel	7,358 MMBtu/yr	55,198 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.009
SDH068	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH069	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH070	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH071	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH072	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH073	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH074	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH075	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH076	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH077	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH078	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH079	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH080	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH081	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH082	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH083	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH084	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH085	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH086	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH087	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH088	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH089	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH090	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH091	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH092	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH093	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH094	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH095	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH096	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH097	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH098	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH099	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH100	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH101	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH102	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH126	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH137	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH138	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH139	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH140	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH141	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008

ConocoPhillips Alaska, Inc. - Kuparuk River Unit
Portable Equipment Inventory - Heaters PTE

Emission Unit ID	Emission Unit Description	Manufacturer	Model	Heat Input Rating	Fuel Type	Total MMBTUs	Estimated Fuel Use	Maximum Operation	Potential Emissions (tpy)				
									NO_X	CO	PM_{10}	SO_2	VOC
SDH142	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH143	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH144	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH145	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH146	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH147	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH148	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH149	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH150	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH151	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH152	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH153	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH154	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH155	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH156	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH157	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH158	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH159	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH160	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH161	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH162	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH163	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH164	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH165	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH166	Heater	WACKER NEUSON	ARCTIC BEAR XHD	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH167	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH168	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH169	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH170	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH171	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH172	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH173	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH174	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH175	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH176	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH177	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH178	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH179	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH180	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH181	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH182	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH183	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570 MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008

ConocoPhillips Alaska, Inc. - Kuparuk River Unit
Portable Equipment Inventory - Heaters PTE

Emission Unit ID	Emission Unit Description	Manufacturer	Model	Heat Input Rating	Fuel Type	Total MMBTUs		Estimated Fuel Use	Maximum Operation	Potential Emissions (tpy)				
										NO_X	CO	PM_{10}	SO_2	VOC
SDH184	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH185	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH186	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH187	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH188	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH189	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH190	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH191	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH192	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH193	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH194	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH195	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH196	Heater	Tioga	IDF3KSCO	0.75 MMBtu/hr	diesel	6,570	MMBtu/yr	49,284 gal/yr	8,760 hr/yr	0.5	0.12	0.03	0.4	0.008
SDH197	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH198	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH199	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH200	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH201	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH202	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH203	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH204	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH205	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH206	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH207	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH208	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH209	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH210	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH211	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH212	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH213	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH214	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH215	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH216	Heater	ALLMAND BROS	MH1000	1.26 MMBtu/hr	diesel	11,060	MMBtu/yr	82,961 gal/yr	8,760 hr/yr	0.8	0.21	0.04	0.6	0.014
SDH217	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH218	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH219	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH220	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH221	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH222	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH223	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH224	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH225	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665	MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010

ConocoPhillips Alaska, Inc. - Kuparuk River Unit
Portable Equipment Inventory - Heaters PTE

Emission Unit ID	Emission Unit Description	Manufacturer	Model	Heat Input Rating	Fuel Type	Total MMBTUs	Estimated Fuel Use	Maximum Operation	Potential Emissions (tpy) NO_X	CO	PM_{10}	SO_2	VOC
SDH226	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH227	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH228	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH229	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH230	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH231	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH232	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH233	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH234	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH235	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
SDH236	Heater	Equip Source	ES700	0.88 MMBtu/hr	diesel	7,665 MMBtu/yr	57,498 gal/yr	8,760 hr/yr	0.6	0.14	0.03	0.4	0.010
					TOTAL	**1,013,663 MMBtu/yr**		**TOTAL EMISSIONS**	**76.0**	**19.0**	**4.1**	**58.4**	**1.3**

Total = 115.7 MMBtu/hr

Fuel Type/Rating	Emission Factors (lb/10^3 gal) NOx	CO	PM10	SO2	VOC
Diesel (>0.3 and <100 MMBtu/hr)	20	5	1.08	15.4	0.34
Diesel (<0.3 MMBtu/hr)	18	5	0.4	15.4	0.71

Notes on Emission Calculation Methodology:

1. Diesel Sulfur Content 0.113 wt% S
2. Diesel Heating Value 133,310 Btu/gal
3. Diesel Fuel Density 6.802 lb/gal (approximate)
4. Emissions calculated based on mass balance (SO2) and factors from AP-42, Tables 1.3-1, 1.3-2, 1.3-3, and 1.3-7
5. Totem heater input provided by KIC operation personnel.
6. Heater efficiency assumed at 80 percent for all heaters **0.80**
7. "Maximum Operation" is conservatively assumed to be 8,760 hours in a calendar year. PTE is distributed in three equal parts between CPF-1, CPF-2, and CPF-3.

Other Notes

8. Emission units with IDs in the "SDH" series are combination heaters and heater fan engines housed together in a single chassis. The heater portion is listed in this table. The engine portion of the unit is listed on the "Portable_Engines" tab.

ConocoPhillips Alaska, Inc. - Kuparuk River Unit
2014 Well Flowbacks

Well Name	Date	Time	Cum Liquid STB	Cum Gas MSCF	Comments
1C-151	3/26/2014	65.00 hrs	3446.00	569.1	New well; live crude to tanks; vented to atmosphere

Totals (including any estimated volume) =	3446.00	569		
# of well flowbacks vented to atmosphere (estimated volume) =		0	@CPF-1 =	1
# of well flowbacks vented to atmosphere (known volume) =		1	@CPF-2 =	0
			@CPF-3 =	0

Kup Oil w/ Kup EOS --> No Head (14.7 psia) & 60 F

Single Flash

Component	MW	Volume (%)	Volume (Mscf)	Mass (tons)	Mass (tonnes)	Mass (tonnes)		
CO2	44.0	0.9580	5.5	0.32	0.29	0.18	← CO2	
N2	28.0	0.000	0.0	0.000	0.000	0.018		
C1	16.0	79.3	451	9.5	8.6	3.1	← Methane	
C2	30.1	7.2	41	1.6	1.5	3.2		
C3	44.1	4.7	27	1.6	1.4	8.8		VOC total (tonnes)
C4	58.1	3.88	22	1.7	1.5	6.9		20.1
C5	72.2	1.36	8	0.7	0.7	2.6		
C6-C7	93.0	2.21	12.6	1.54	1.40	0.70		VOC total (tons)
C8-C10	128.0	0.335	1.9	0.32	0.29	1.02		22.2
C11+	145.0	0.0	0.032	0.006	0.006			
Benzene						0.019	← Benzene	
		100	569	17.3	15.7	26.6		

Example Calculation:

ton CO_2 = (Cum Gas Mscf) * (0.9580%/100) * (1000 scf/Mscf) * (1/379 scf/lb-mol) * (44.0 lb CO_2/lb-mol CO_2) * (ton/2000 lb) = tons CO_2

Tank Identification															
Source	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**
Tank Tag No.	**T1-101**[1]	**T-201**[5]	**T-2201**[2]	**T-2202** [2]	**T1-P101A** [3]	**T1-P101B** [3]	**T-1002A** [4]	**T-1002B** [4]	**G1-19501**[5]	**G1-19502**[5]	**G1-19503**[5]	**G1-19504**[5]	**T-1005**	**T-1009**	**T-175**
Type of Tank/Service	VFRT/SOT	VFRT/Diesel	VFRT/PWT	VFRT/PWT	VFRT/Divert	VFRT/Divert	Horiz./Water	Horiz./Water	VFRT/Diesel	VFRT/Diesel	VFRT/Diesel	VFRT/Diesel	VFRT/CFW	VFRT/LRST	VFRT/EB
Content Used in Tanks 4.09d	Crude	Diesel	Crude	Crude	Crude	Crude	Water	Water	Diesel	Diesel	Diesel	Diesel	Crude	Crude	Naphtha
VR or other Control	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Vented back into Process	Vented back into process	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	100 F	100 F	140 F	140 F	135 F	135 F	140 F	140 F	100 F	75 F	75 F	75 F	90 F	75 F	Ambient
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions															
Shell Height (ft)	30	24	42	42	40	40	32	32	39	39	39	44	16	38.5	42
Diameter (ft)	35	25	30	30	100	100	10	10	23	23	23	40	30	13.6	10
Max. Liquid Height (ft)	29	23	38	38	32	32			38	38	38	43	15	37	41
Avg. Liquid Height (ft)	15	12	21	21	16	16			20	20	20	22	8	16	21
Avg. D Liq. Level (ft)			3.8	3.8											
Nameplate Volume (gallons)	215,211	88,122	222,066	222,066	2,310,000	2,310,000	19,000	19,000	123,952	123,952	123,952	413,584	84,000	36,540	25,000
Design Capacity (gallons)	215,913	88,128	222,082	222,082	2,350,075	2,350,075	18,801	18,801	121,211	121,211	121,211	413,613	84,603	41,837	24,676
Working Volume (gallons)	208,716	84,456	200,931	200,931	1,880,060	1,880,060	-	-	118,103	118,103	118,103	404,213	79,315	40,207	24,088
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	1,916,250,000	1,916,250,000	12,000,000	12,000,000	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12	0.7	954	954	6.4	6.4	12	12	134.1	90.4	90.4	23.6	12	12	12
Paint Characteristics															
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics															
Type	Dome	Dome	Dome	Dome	Dome	Dome			Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)															
Radius (ft) [Dome Roof]															
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings															
Vacuum Setting (in.WC)															
Pressure Setting (in.WC)													10	10	
TANKS 4.09 Results (Annual VOC Emissions)															
Annual Breathing Loss (lb) (PTE)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240.5
Annual Working Loss (lb) (PTE)	14267.25	219.59	380,681.04	380,681.04	0.00	0.00	0	0	1407.4	417.95	417.95	766.32	4268.74	1650.74	483.45
Total Loss (ton/yr) (PTE)	**7.134**	**0.110**	**190.341**	**190.341**	**0.000**	**0.000**	**0.000**	**0.000**	**0.704**	**0.209**	**0.209**	**0.383**	**2.134**	**0.825**	**0.362**
Total Loss (ton/yr) (est. actual)	**7.134**	**0.007**	**190.341**	**190.341**	**0.000**	**0.000**	**0.000**	**0.000**	**0.670**	**0.202**	**0.202**	**0.361**	**2.134**	**0.825**	**0.362**

SOURCE TOTAL (PTE)	**394.06 ton/yr**	(does not include temporary tanks)
SOURCE TOTAL (est. actual)	**393.88 ton/yr**	(does not include temporary tanks)

Notes

There are no breathing losses from heated tanks

Water and sanitary wastewater have no VOC emissions

[1] Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

[2] The PW tanks were calculated as constant level tanks, using an adjusted turnover rate and an adjusted net throughput which were calculated as follows:

Calculated turnover rate =	9536.838	turnovers/yr
10% of max height (D) =	3.8	feet
D / max liquid height =	0.1	
Adjusted turnover rate =	953.68	turnovers/yr
Adjusted throughput =	191,625,000	gallons/yr

[3] There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

[4] T-1002A and T-1002B contain only snow melt

[5] Potential emissions from tanks T-201, G1-19501, G1-19502, G1-19503, and G1-19504 are set based on an estimated 12, 150, 100, 100, and 25 turnovers per year (respectively). These are not necessarily fixed values and may be changed in the future.

Abbreviations

PST - Primary Separation Tank	VFRT - Verical Fixed Roof Tank
SOT - Slop Oil Tank	AIP - Abandoned in Place
OF/DW - Overflow/Dirty Water	EB - Emulsion Breaker
OW - Oily Water	CFW - Contaminated Freshwater
PWT - Produced Water Tank	LRST - Liquid Recycle Surge Tank

Tank Identification												
Source	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**	**CPF1**
Tank Tag No.	**T-176**	**T-178**	**T-1A01**	**T-1E01**	**T-1F1901**	**T-1G01**	**T-1L01**	**T-1Q01**	**T-1R01**	**T-1Y01**	**T-CL03**	**T-CW01**
Type of Tank/Service	VFRT/TEG	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/Glycol	VFRT/Glycol
Content Used in Tanks 4.09d	TEG	Methanol	Methanol	Methanol	Methanol	Methanol	Methanol	Methanol	Methanol	Methanol	Glycol	Ethylene Glycol
VR or other Control	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions												
Shell Height (ft)	42	26	16	16	16	16	14	14	14	14	19	17.25
Diameter (ft)	10	10	30	30	30	30	25	25	25	25	13.5	10
Max. Liquid Height (ft)	41	25	15	15	15	15	13	13	13	13	18	16
Avg. Liquid Height (ft)	21	13	8	8	8	8	7	7	7	7	8	8
Avg. D Liq. Level (ft)												
Nameplate Volume (gallons)	25,000	15,000	84,000	84,000	84,000	84,000	51,450	51,450	51,450	51,450	21,000	10,080
Design Capacity (gallons)	24,676	15,275	84,603	84,603	84,603	84,603	51,408	51,408	51,408	51,408	20,344	10,135
Working Volume (gallons)	24,088	14,688	79,315	79,315	79,315	79,315	47,736	47,736	47,736	47,736	19,274	9,400
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12	12	12	12	12	12	12	12	12	12	12	12
Paint Characteristics												
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics												
Type	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)												
Radius (ft) [Dome Roof]												
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings												
Vacuum Setting (in.WC)												
Pressure Setting (in.WC)												
TANKS 4.09 Results (Annual VOC Emissions)												
Annual Breathing Loss (lb) (PTE)	0.78	39.29	168.93	168.93	168.93	168.93	85.23	85.23	85.23	85.23	0.09	0.05
Annual Working Loss (lb) (PTE)	0.5	26.92	224.72	224.72	224.72	224.72	157.18	157.18	157.18	157.18	0.06	0.07
Total Loss (ton/yr) (PTE)	**0.001**	**0.033**	**0.197**	**0.197**	**0.197**	**0.197**	**0.121**	**0.121**	**0.121**	**0.121**	**0.0001**	**0.0001**
Total Loss (ton/yr) (est. actual)	**0.001**	**0.033**	**0.197**	**0.197**	**0.197**	**0.197**	**0.121**	**0.121**	**0.121**	**0.121**	**0.0001**	**0.0001**
SOURCE TOTAL (PTE)												
SOURCE TOTAL (est. actual)												

Notes

There are no breathing losses from heated tanks
Water and sanitary wastewater have no VOC emissions

1 Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

2 The PW tanks were calculated as constant level tanks, using an adjusted turnover rate and an adjusted net throughput which were calculated as follows:

Calculated turnover rate =	9536.838	turnovers/yr
10% of max height (D) =	3.8	feet
D / max liquid height =	0.1	
Adjusted turnover rate =	953.68	turnovers/yr
Adjusted throughput =	191,625,000	gallons/yr

3 There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

4 T-1002A and T-1002B contain only snow melt

5 Potential emissions from tanks T-201, G1-19501, G1-19502, G1-19503, and G1-19504 are set based on an estimated 12, 150, 100, 100, and 25 turnovers per year (respectively). These are not necessarily fixed values and may be changed in the future.

Abbreviations

PST - Primary Separation Tank	VFRT - Verical Fixed Roof Tank
SOT - Slop Oil Tank	AIP - Abandoned in Place
OF/DW - Overflow/Dirty Water	EB - Emulsion Breaker
OW - Oily Water	CFW - Contaminated Freshwater
PWT - Produced Water Tank	LRST - Liquid Recycle Surge Tank

Tank Identification																	
Source	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**CPF2**	**DS2A**	**DS2B**	**DS2C**	**DS2D**	**DS2E**
Tank Tag No.	**T1-P201A[1,2]**	**T1-P201B[1,2]**	**T1-4201[8]**	**T-CM03[3]**	**T-AN177[4]**	**T-CM01[5, 6]**	**T-CM02[1, 5]**	**T1-101[1, 7]**	**T-AN175**	**T-AN176**	**T-AN105[1]**	**NABORS**	**T-2A01**	**T-2B01**	**T-2C01**	**T-2D01**	**T-2E01**
Type of Tank/Service	VFRT/Crude	VFRT/Crude	VFRT/Diesel	VFRT/Biocide	HORIZ/Lube Oil	VFRT/ Seawater	VFRT/PWT	VFRT/SOT	HORIZ/TEG	HORIZ/TEG	VFRT/SOT	VFRT/Sea Water	VFRT/MeOH	VFRT/Diesel	VFRT/Diesel	VFRT/Diesel	VFRT/MeOH
Content Used in Tanks 4.09d	Crude	Crude	Diesel	Water	Resid. No 6	Water	Crude	Crude	TEG	TEG	Crude	Water	Methanol	Diesel	Diesel	Diesel	Methanol
VR or other Control	CVS	CVS	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	CVS	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	120 F	135 F	Ambient	75 F	75 F	60 F	140 F	100 F	75 F	75 F	Ambient	125 F	Ambient	80 F	80 F	80 F	Ambient
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions																	
Shell Height (ft)	39.5	39.5	24	22	34	42	42	30	42	42	18.5	13	14	14	14	14	23.75
Diameter (ft)	100	100	25	13.5	10	30	30	50	10	10	11.5	13.5	25	25	25	25	13.3
Max. Liquid Height (ft)	38	38	23	21	NA	41	38	29	NA	NA	17	12	13	13	13	13	22
Avg. Liquid Height (ft)	20	20	12	11	NA	21	21	15	NA	NA	9	7	7	7	7	7	12
Avg. D Liq. Level (ft)							3.8										
Nameplate Volume (gallons)	2,310,000	2,310,000	84,000	23,520	20,000	220,000	220,000	440,608	25,000	25,000	16,800	14,000	51,450	51,450	51,450	51,450	24,700
Design Capacity (gallons)	2,320,699	2,320,699	88,128	23,557	19,976	222,082	222,082	440,639	24,676	24,676	14,374	13,920	51,408	51,408	51,408	51,408	24,682
Working Volume (gallons)	2,232,571	2,232,571	84,456	22,486	20,000	216,794	200,931	425,951	25,000	25,000	13,209	12,849	47,736	47,736	47,736	47,736	22,864
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	4,292,400,000	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12.0	12.0	146.4	12.0	12.0	12.0	2,136.3	24.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Paint Characteristics																	
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics																	
Type	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)																	
Radius (ft) [Dome Roof]																	
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings																	
Vacuum Setting (in.WC)																	
Pressure Setting (in.WC)																	
TANKS 4.09 Results (Annual VOC Emissions)																	
Annual Breathing Loss (lb) (PTE)	0	0	5.99	0	0	0	0	0	0	0	137.59	0	85.23	0	0	0	49.39
Annual Working Loss (lb) (PTE)	0	0	35.57	0	0.08	0	777784.3	0	9.37	9.37	198.39	0	157.18	53.19	53.19	53.19	66.85
Total Loss (ton/yr) (PTE)	**0.000**	**0.000**	**0.021**	**0.000**	**0.00004**	**0.000**	**388.892**	**0.000**	**0.005**	**0.005**	**0.168**	**0.000**	**0.121**	**0.027**	**0.027**	**0.027**	**0.058**
Total Loss (ton/yr) (est. actual)	**0.000**	**0.000**	**0.019**	**0.000**	**0.00004**	**0.000**	**388.892**	**0.000**	**0.005**	**0.005**	**0.168**	**0.000**	**0.121**	**0.027**	**0.027**	**0.027**	**0.058**

SOURCE TOTAL (PTE)	**390.06 ton/yr**
SOURCE TOTAL (est. actual)	**390.00 ton/yr**

Notes

There are no breathing losses from heated tanks
Water and sanitary wastewater have no VOC emissions

[1] Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

[2] There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

[3] The biocide contained in T-CM03 is less volatile than water, therefore emissions are considered to be negligible

[4] Due to it's low vapor pressure, Residual Oil #6 was used to estimate emissions from the lube oil tank, which are negligible

[5] The PW tanks were calculated as constant level tanks, using an adjusted turnover rate and an adjusted net throughput which were calculated as follows:

Calculated turnover rate =	21362.516	turnovers/year
10% of max height (D) =	3.8	feet
D / max liquid height =	0.1	
Adjusted turnover rate =	2136.25	turnovers/year
Adjusted throughput =	429,240,000	gallons/year

[6] Tank T-CM01 is normally used for seawater storage, but both T-CM01 and T-CM02 may be used for produced water storage, though typically only one is used at a time.

[7] Tank T1-101 is subject to the control requirements of NSPS Subpart Ka; therefore, PTE for tank T1-101 is zero.

[8] Potential emissions from tanks T1-4201 and T-2Z07B are set based on an estimated 175 and 12 turnovers per year (respectively). These are not necessarily fixed values and may be changed in the future.

Abbreviations

PST - Primary Separation Tank	VFRT - Verical Fixed Roof Tank
SOT - Slop Oil Tank	AIP - Abandoned in Place
OF/DW - Overflow/Dirty Water	EB - Emulsion Breaker
OW - Oily Water	CFW - Contaminated Freshwater
PWT - Produced Water Tank	LRST - Liquid Recycle Surge Tank

Tank Identification														
Source	**DS2F**	**DS2G**	**DS2H**	**DS2K**	**DS2M**	**DS2N**	**DS2T**	**DS2U**	**DS2V**	**DS2W**	**DS2X**	**DS2Z**	**DS2Z**	**DS2Z**
Tank Tag No.	**T-2F01**	**T-2G01**	**T-2H01**	**T-N02-01**	**T-N03-01**	**T-2N01**	**T-3M01**	**T-2U01**	**T-2V01**	**T-2W01**	**T-2X01**	**T-2Z07B**[8]	**PGE-86AJ**	**T-2Z01**
Type of Tank/Service	VFRT/Diesel	VFRT/Diesel	VFRT/Diesel	VFRT/MeOH	VFRT/MeOH	HORIZ/Diesel	VFRT/Diesel	VFRT/Diesel	VFRT/MeOH	VFRT/Diesel	VFRT/Diesel	VFRT/Scale Inhibitor	VFRT/Scale Inhibitor	VFRT/Diesel
Content Used in Tanks 4.09d	Diesel	Diesel	Diesel	Methanol	Methanol	Diesel	Diesel	Diesel	Methanol	Diesel	Diesel	Scale Inhibitor	Scale Inhibitor	Diesel
VR or other Control	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	80 F	80 F	80 F	Ambient	Ambient	Ambient	80 F	80 F	Ambient	80 F	80 F	50 F	50 F	80 F
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions														
Shell Height (ft)	14	14	14	38.5	38.6	60	27	14	14	14	14	20	20	14
Diameter (ft)	25	25	25	13.6	13.8	12	13.4	25	25	25	25	12	12	25
Max. Liquid Height (ft)	13	13	13	37	37	NA	26	13	13	13	13	19	19	13
Avg. Liquid Height (ft)	7	7	7	19	19	NA	13	7	7	7	7	10	10	7
Avg. D Liq. Level (ft)														
Nameplate Volume (gallons)	51,450	51,450	51,450	36,540	36,540	50,000	28,266	51,450	51,450	51,450	51,450	16,800	16,800	51,450
Design Capacity (gallons)	51,408	51,408	51,408	41,837	43,188	50,762	28,484	51,408	51,408	51,408	51,408	16,921	16,921	51,408
Working Volume (gallons)	47,736	47,736	47,736	40,207	41,398	50,000	27,429	47,736	47,736	47,736	47,736	16,075	16,075	47,736
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	100,000	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	150,000	150,000	Use Turnovers
Turnovers per year	12.0	12.0	12.0	12.0	12.0	2.0	12.0	12.0	12.0	12.0	12.0	3.6	9.3	12.0
Paint Characteristics														
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics														
Type	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)														
Radius (ft) [Dome Roof]														
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings														
Vacuum Setting (in.WC)														
Pressure Setting (in.WC)														
TANKS 4.09 Results (Annual VOC Emissions)														
Annual Breathing Loss (lb) (PTE)	0	0	0	85.23	85.23	4.69	0	0	85.23	0	0	0	0	0
Annual Working Loss (lb) (PTE)	53.19	53.19	53.19	157.18	157.18	3.53	30.56	53.19	157.18	53.19	53.19	159.26	119.5	53.19
Total Loss (ton/yr) (PTE)	**0.027**	**0.027**	**0.027**	**0.121**	**0.121**	**0.004**	**0.015**	**0.027**	**0.121**	**0.027**	**0.027**	**0.080**	**0.060**	**0.027**
Total Loss (ton/yr) (est. actual)	**0.027**	**0.027**	**0.027**	**0.121**	**0.121**	**0.004**	**0.015**	**0.027**	**0.121**	**0.027**	**0.027**	**0.024**	**0.060**	**0.027**
SOURCE TOTAL (PTE)														
SOURCE TOTAL (est. actual)														

Notes

There are no breathing losses from heated tanks
Water and sanitary wastewater have no VOC emissions

1 Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

2 There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

3 The biocide contained in T-CM03 is less volatile than water, therefore emissions are considered to be negligible

4 Due to it's low vapor pressure, Residual Oil #6 was used to estimate emissions from the lube oil tank, which are negligible

5 The PW tanks were calculated as constant level tanks, using an adjusted turnover rate and an adjusted net throughput which were calculated as follows:

Calculated turnover rate =	21362.516	turnovers/year
10% of max height (D) =	3.8	feet
D / max liquid height =	0.1	
Adjusted turnover rate =	2136.25	turnovers/year
Adjusted throughput =	429,240,000	gallons/year

6 Tank T-CM01 is normally used for seawater storage, but both T-CM01 and T-CM02 may be used for produced water storage, though typically only one is used at a time.

7 Tank T1-101 is subject to the control requirements of NSPS Subpart Ka; therefore, PTE for tank T1-101 is zero.

8 Potential emissions from tanks T1-4201 and T-2Z07B are set based on an estimated 175 and 12 turnovers per year (respectively). These are not necessarily fixed values and may be changed in the future.

Abbreviations

PST - Primary Separation Tank	VFRT - Verical Fixed Roof Tank
SOT - Slop Oil Tank	AIP - Abandoned in Place
OF/DW - Overflow/Dirty Water	EB - Emulsion Breaker
OW - Oily Water	CFW - Contaminated Freshwater
PWT - Produced Water Tank	LRST - Liquid Recycle Surge Tank

Tank Identification																
Source	**CPF3**	**CPF3**	**CPF3**	**CPF3**	**CPF3**	**CPF3**	**CPF3**	**DS3A**	**DS3B**	**DS3C**	**DS3F**	**DS3G**	**DS3H**	**DS3I**	**DS3J**	**DS3K**
Tank Tag No.	**T-EF01**[1, 2]	**T-EF62**[3]	**T-EF51**[1, 4]	**T-EF52**[1, 4]	**T-EF33**[5]	**T-EF03**	**T-EF06**	**T-3A01**	**T-3B01**	**T-3C01**	**T-3F01**[5]	**T-N04-01**[5]	**T-N01-01**[5]	**T-3I01**[5]	**T-3J01**	**T-3K01**[5]
Type of Tank/Service	VFRT/SOT	VFRT/Lube Oil	VFRT /Seawater	VFRT/PWT	VFRT/EG	VFRT/Diesel	VFRT/Waste Water	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/AF	VFRT/MeOH
Content Used in Tanks 4.09d	Crude	Resid. No 6	Water	Crude	EG	Diesel	Water	Methanol	Methanol	Methanol	Methanol	Methanol	Methanol	Methanol	Diesel	Methanol
VR or other Control	CVS	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	125 F	40 F	40 F	40 F	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient	Ambient
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions																
Shell Height (ft)	30	10	42	42	24	18	19.5	23.66	32.66	32.66	23.66	38.5	38.5	23.66	23.66	27
Diameter (ft)	50	14.5	30	30	13	20	13.5	13.33	13.33	13.33	13.33	13.66	13.66	13.33	13.33	13.33
Max. Liquid Height (ft)	29	9	41	38	23	17	18	22	31	31	22	37	37	22	21	26
Avg. Liquid Height (ft)	15	5	21	21	12	9	10	12	16	16	12	20	20	12	12	14
Avg. D Liq. Level (ft)				3.8												
Nameplate Volume (gallons)	420,000	12,348	210,000	210,000	23,520	42,000	23,100	24,360	33,600	33,600	24,360	36,540	36,540	24,360	24,360	28,266
Design Capacity (gallons)	440,639	12,353	222,082	222,082	23,830	42,301	20,880	24,700	34,096	34,096	24,700	42,207	42,207	24,700	24,700	28,187
Working Volume (gallons)	425,951	11,117	216,794	200,931	22,837	39,951	19,274	22,967	32,363	32,363	22,967	40,563	40,563	22,967	21,923	27,143
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	765,000,000	1,839,600,000	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12.0	12.0	3,642.9	915.5	81.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Paint Characteristics																
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics																
Type	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)																
Radius (ft) [Dome Roof]																
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings																
Vacuum Setting (in.WC)																
Pressure Setting (in.WC)																
TANKS 4.09 Results (Annual VOC Emissions)																
Annual Breathing Loss (lb) (PTE)	0	0.001	0	0	0.06	3.53	0	49.39	85.23	85.23	49.39	85.23	85.23	49.39	1.25	85.23
Annual Working Loss (lb) (PTE)	0	0.001	0	62,653.46	0.09	4.69	0	66.85	157.18	157.18	66.85	157.18	157.18	66.85	2.09	157.18
Total Loss (ton/yr) (PTE)	**0.000**	**0.000**	**0.000**	**31.327**	**0.000**	**0.004**	**0.000**	**0.058**	**0.121**	**0.121**	**0.058**	**0.121**	**0.121**	**0.058**	**0.002**	**0.121**
Total Loss (ton/yr) (est. actual)	**0.000**	**0.000**	**0.000**	**31.327**	**0.000**	**0.004**	**0.000**	**0.058**	**0.121**	**0.121**	**0.058**	**0.121**	**0.121**	**0.058**	**0.002**	**0.121**

SOURCE TOTAL (PTE)	**32.53 ton/yr**
SOURCE TOTAL (est. actual)	**32.53 ton/yr**

Notes

There are no breathing losses from heated tanks

Water and sanitary wastewater have no VOC emissions

1 Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

2 There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

3 Due to it's low vapor pressure, Residual Oil #6 was used to estimate emissions from the lube oil tank, which are negligible

4 The PW tanks were calculated as constant level tanks, using an adjusted turnover rate and an adjusted net throughput which were calculated as follows:

Calculated turnover rate =	9155.364	turnovers/year
10% of max height (D) =	3.8	feet
D / max liquid height =	0.1	
Adjusted turnover rate =	915.54	turnovers/year
Adjusted throughput =	183,960,000	gallons/year

5 Emission estimate is based on one turnover per month, however, records indicate that the throughput for this tank is typically zero gallons/yr

Abbreviations

PST - Primary Separation Tank	VFRT - Verical Fixed Roof Tank
SOT - Slop Oil Tank	AIP - Abandoned in Place
OF/DW - Overflow/Dirty Water	EB - Emulsion Breaker
OW - Oily Water	CFW - Contaminated Freshwater
PWT - Produced Water Tank	LRST - Liquid Recycle Surge Tank

Tank Identification				
Source	**DS3M**	**DS3N**	**DS3O**	**DS3Q**
Tank Tag No.	**T-M01-02**	**T-3N01[5]**	**T-M02-02[5]**	**T-3Q01[5]**
Type of Tank/Service	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH	VFRT/MeOH
Content Used in Tanks 4.09d	Methanol	Methanol	Methanol	Methanol
VR or other Control	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	Ambient	Ambient	Ambient	Ambient
Operational Status	Operating	Operating	Operating	Operating
Tank Dimensions				
Shell Height (ft)	28.6	27	28.6	23.66
Diameter (ft)	13.66	13.33	13.66	13.33
Max. Liquid Height (ft)	27	26	27	21
Avg. Liquid Height (ft)	20	14	14	12
Avg. D Liq. Level (ft)				
Nameplate Volume (gallons)	26,460	28,266	26,460	24,360
Design Capacity (gallons)	31,354	28,187	31,354	24,700
Working Volume (gallons)	29,600	27,143	29,600	21,923
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12.0	12.0	12.0	12.0
Paint Characteristics				
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good
Roof Characteristics				
Type	Dome	Dome	Dome	Dome
Height (ft)				
Radius (ft) [Dome Roof]				
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A
Breather Vent Settings				
Vacuum Setting (in.WC)				
Pressure Setting (in.WC)				
TANKS 4.09 Results (Annual VOC Emissions)				
Annual Breathing Loss (lb) (PTE)	85.23	85.23	85.23	49.39
Annual Working Loss (lb) (PTE)	157.18	157.18	157.18	66.85
Total Loss (ton/yr) (PTE)	**0.121**	**0.121**	**0.121**	**0.058**
Total Loss (ton/yr) (est. actual)	**0.121**	**0.121**	**0.121**	**0.058**
SOURCE TOTAL (PTE)				
SOURCE TOTAL (est. actual)				

Notes

There are no breathing losses from heated tanks

Water and sanitary wastewater have no VOC emissions

[1] Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

[2] There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

[3] Due to it's low vapor pressure, Residual Oil #6 was used to estimate emissions from the lube oil tank, which are negligible

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D / max liquid height =	0.1	
Adjusted turnover rate =	915.54	turnovers/year
Adjusted throughput =	183,960,000	gallons/year

[5] Emission estimate is based on one turnover per month, however, records indicate that the throughput for this tank is typically zero gallons/yr

Abbreviations

PST - Primary Separation Tank	VFRT - Verical Fixed Roof Tank
SOT - Slop Oil Tank	AIP - Abandoned in Place
OF/DW - Overflow/Dirty Water	EB - Emulsion Breaker
OW - Oily Water	CFW - Contaminated Freshwater
PWT - Produced Water Tank	LRST - Liquid Recycle Surge Tank

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number	Unit ID	Fuel Type	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Year: 2014																																				
Gas Turbines																																				
C-2101-A	1	gas	744.0	109.0	672.0	99.6	671.7	98.8	2,087.7	307.4	720.0	103.4	744.0	102.0	720.0	95.2	2,184.0	300.5	744.0	96.3	744.0	97.1	720.0	96.2	2,208.0	289.7	723.0	99.0	721.0	100.3	744.0	107.1	2,188.0	306.4	8,667.7	1,204.0
C-2101-B	2	gas	744.0	104.5	672.0	94.9	662.8	93.4	2,078.8	292.8	720.0	99.0	744.0	98.3	720.0	91.7	2,184.0	288.9	744.0	92.9	744.0	93.3	720.0	92.3	2,208.0	278.5	728.6	96.0	721.0	96.9	744.0	102.5	2,193.6	295.4	8,664.4	1,155.6
C-2101-C	3	gas	744.0	107.9	672.0	98.3	612.7	89.0	2,028.7	295.2	715.5	100.6	744.0	99.7	690.8	89.5	2,150.4	289.8	744.0	95.2	744.0	95.5	720.0	94.8	2,208.0	285.4	714.9	96.0	721.0	99.2	744.0	105.5	2,179.9	300.7	8,567.0	1,171.1
G-201-A	4	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	406.4	14.8	0.0	0.0	95.8	2.8	502.3	17.6	442.3	16.2	70.2	2.5	411.5	12.3	924.0	31.0	744.0	26.3	721.0	24.4	744.0	25.4	2,209.0	76.1	3,635.3	124.8
G-201-A	4	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-201-B	5	gas	744.0	28.0	672.0	25.9	732.5	25.5	2,148.5	79.3	716.5	24.6	744.0	23.3	720.0	22.0	2,180.5	69.8	456.2	16.8	70.3	2.5	183.3	5.8	709.8	25.1	0.920	0.030	325.4	10.5	744.0	26.1	1,070.3	36.7	6,109.1	211.0
G-201-B	5	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-201-C	6	gas	744.0	27.8	672.0	25.5	742.4	23.6	2,158.4	76.9	692.2	23.5	744.0	22.7	720.0	21.3	2,156.2	67.5	736.7	24.3	744.0	21.3	369.9	10.8	1,850.6	56.4	0.0	0.0	153.3	4.8	189.3	5.8	342.6	10.6	6,507.8	211.4
G-201-C	6	liquid	0.0	0.0	0.0	0.0	10.3	3,905.3	10.3	3,905.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.3	3,905.3
G-201-D	7	gas	744.0	27.8	672.0	23.1	743.0	24.6	2,159.0	75.5	701.7	23.6	744.0	22.4	720.0	21.2	2,165.7	67.3	744.0	23.2	744.0	21.0	609.1	17.9	2,097.1	62.1	744.0	26.2	680.5	23.3	347.0	11.6	1,771.5	61.1	8,193.2	265.9
G-201-D	7	liquid	0.0	0.0	0.0	0.0	10.0	3,810.0	10.0	3,810.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	3,810.0
G-3201-E	8	gas	0.330	0.020	0.0	0.0	19.3	0.640	19.7	0.660	403.4	15.5	0.0	0.0	96.3	3.0	499.7	18.4	7.4	0.190	3.5	0.120	48.1	1.8	59.0	2.1	0.0	0.0	181.2	6.0	318.8	11.3	499.9	17.3	1,078.3	38.5
G-3201-E	8	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-3201-F	9	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-3201-F	9	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P-2202-A	10	gas	744.0	28.7	545.3	19.8	734.3	26.3	2,023.7	74.8	720.0	27.2	705.1	26.9	474.2	17.7	1,899.3	71.8	744.0	27.5	677.3	25.5	720.0	26.1	2,141.3	79.1	671.4	24.8	721.0	27.1	739.0	26.2	2,131.4	78.1	8,195.7	303.8
P-2202-B	11	gas	744.0	29.7	525.9	20.3	430.9	15.9	1,700.8	66.0	423.1	15.8	600.5	23.0	470.1	17.2	1,493.7	56.0	744.0	28.3	338.8	13.2	628.3	23.2	1,711.2	64.7	741.0	28.3	721.0	28.2	707.3	26.4	2,169.3	82.9	7,075.0	269.6
P-CL07-A	12	gas	744.0	30.1	672.0	26.9	732.5	28.3	2,148.5	85.2	712.3	29.0	646.3	26.3	564.5	21.8	1,923.1	77.0	605.5	23.3	743.8	28.9	488.2	18.6	1,837.4	70.8	581.5	22.2	397.5	15.0	744.0	28.8	1,723.0	66.0	7,631.9	299.0
P-CL07-A	12	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P-CL07-B	13	gas	479.8	18.3	607.2	20.3	733.0	24.2	1,820.0	62.8	720.0	25.5	585.8	20.7	720.0	25.2	2,025.8	71.4	744.0	26.0	743.8	26.6	693.0	23.9	2,180.8	76.4	680.1	23.5	439.6	15.1	744.0	26.1	1,863.8	64.6	7,890.3	275.3
P-CL07-B	13	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-3203	14	gas	744.0	237.6	672.0	231.5	743.0	220.6	2,159.0	689.7	426.6	119.0	744.0	200.7	720.0	173.9	1,890.6	493.5	744.0	188.4	744.0	169.3	681.2	188.4	2,169.2	546.1	744.0	222.8	721.0	214.9	742.3	262.8	2,207.3	700.5	8,426.0	2,429.8
Gas-Fired Heaters (Excluding Drill Site Heaters)																																				
Group II Heaters																																				
H-201	15	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H-201	15	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G1-14-01	16	gas	744.0	23.3	672.0	20.6	732.4	20.7	2,148.4	64.7	539.0	14.5	744.0	20.2	711.8	19.3	1,994.8	54.1	731.2	19.6	340.2	9.5	444.8	12.3	1,516.2	41.3	733.6	21.1	720.3	21.5	743.8	23.1	2,197.7	65.7	7,857.0	225.7
H-3204	17	gas	744.0	2.5	672.0	2.4	743.0	2.4	2,159.0	7.3	442.8	1.3	743.8	2.2	662.8	1.8	1,849.4	5.3	612.4	1.4	653.5	1.5	672.7	1.6	1,938.6	4.6	744.0	1.9	703.7	2.0	739.2	2.8	2,186.8	6.7	8,133.8	23.9
H-102A	18	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
~~H-102A~~	~~18~~	~~liquid~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
Diesel-Fired Equipment > 600 hp																																				
G-701-A	19	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.830	46.4	0.830	46.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.830	46.4
G-701-B	20	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.920	51.4	0.920	51.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.920	51.4
Diesel-Fired Equipment < 600 hp																																				
P-CL04-ECC	21	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P-1A02	22	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
~~P-1E02~~		~~liquid~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
P-1F02	23	liquid	0.910	11.3	0.0	0.0	2.3	28.1	3.2	39.4	0.0	0.0	0.0	0.0	0.750	9.3	0.750	9.3	0.0	0.0	0.0	0.0	0.290	3.6	0.290	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	52.3
P-1G02	24	liquid	0.0	0.0	0.600	7.4	0.0	0.0	0.600	7.4	0.0	0.0	0.600	7.4	0.0	0.0	0.600	7.4	0.390	4.8	0.0	0.0	0.0	0.0	0.390	4.8	1.3	16.5	0.250	3.1	1.3	16.6	2.9	36.2	4.5	55.9
P-1L02	25	liquid	0.470	7.3	1.0	15.5	0.830	12.8	2.3	35.5	5.3	81.3	0.0	0.0	0.0	0.0	5.3	81.3	0.0	0.0	0.0	0.0	0.270	4.2	0.270	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	121.0
P-1Q02	26	liquid	0.0	0.0	0.0	0.0	0.800	12.4	0.800	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.800	12.4
P-1R02	27	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.450	7.0	0.0	0.0	0.0	0.0	0.450	7.0	0.0	0.0	0.500	7.7	0.0	0.0	0.500	7.7	0.850	13.1	2.1	32.4	0.0	0.0	3.0	45.6	3.9	60.3
P-1Y02	28	liquid	0.0	0.0	0.0	0.0	2.0	30.9	2.0	30.9	0.500	7.7	0.0	0.0	0.0	0.0	0.500	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.510	7.9	1.0	15.5	0.0	0.0	1.5	23.3	4.0	62.0
Flares			744.0		672.0		743.0		2,159.0		592.5		744.0		720.0		2,056.5		744.0		720.4		581.0		2,045.4		578.8		721.0		744.0		2,043.8		8,304.7	
H-101B	29	gas	0.0		0.0		0.0		0.0		559.6		0.0		0.0		559.6		0.0		23.6		299.3		322.9		165.9		0.0		0.0		165.9		1,048.3	
H-KF01	30	gas	744.0		672.0		743.0		2,159.0		160.4		744.0		720.0		1,624.4		744.0		720.4		420.7		1,885.1		578.1		721.0		744.0		2,043.1		7,711.7	
H-KF02	31	gas	744.0	67.5	672.0	62.0	743.0	67.6	2,159.0	197.2	160.4	70.2	744.0	53.3	720.0	53.3	1,624.4	176.8	744.0	57.1	720.4	53.2	420.7	44.1	1,885.1	154.4	578.1	48.0	721.0	53.1	744.0	38.1	2,043.1	139.2	7,711.7	667.6
H-CR01A	32	gas	0.0		107.0		743.0		850.0		592.5		744.0		720.0		2,056.5		744.0		493.6		139.0		1,376.6		578.8		721.0		744.0		2,043.8		6,326.9	
H-CR01B	33	gas	744.0		565.1		0.0		1,309.1		127.5		0.0		0.0		127.5		0.0		250.4		581.0		831.4		165.2		0.0		0.0		165.2		2,433.1	
Incinerators																																				
H-250	35	Fuel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Refuse	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons	0.0	tons
H-347	36	Fuel	744.0	1.4	672.0	1.3	72.0	0.137	1,488.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,488.0	2.8
		Refuse	44.5	tons	40.8	tons	3.6	tons	88.9	tons	0	tons	0	tons	0	tons	0.0	tons	0	tons	0	tons	0	tons	0.0	tons	0	tons	0	tons	0	tons	0.0	tons	88.9	tons
Other Equipment (Drill Site Heaters)																																				
H-1A01	37	gas	744.0	11.1	672.0	10.0	743.0	11.1	2,159.0	32.2	720.0	10.7	600.0	8.9	21.5	0.320	1,341.5	20.0	132.0	2.0	744.0	11.1	720.0	10.7	1,596.0	23.8	744.0	11.1	721.0	10.7	744.0	11.1	2,209.0	32.9	7,305.5	108.9
H-1B01	38	gas	0.0		0.0		16.0	0.238	16.0	0.238	0.0		0.0		0.0		0.0	0.0	726.0	10.8	744.0	11.1	720.0	10.7	2,190.0	32.6	744.0	11.1	721.0	10.7	744.0	11.1	2,209.0	32.9	4,415.0	65.8
H-2V01	39	gas	744.0	9.8	672.0	8.9	743.0	9.8	2,159.0	28.5	720.0	9.5	744.0	9.8	720.0	9.5	2,184.0	28.8	611.5	8.1	744.0	9.8	720.0	9.5	2,075.5	27.4	744.0	9.8	720.0	9.5	744.0	9.8	2,208.0	29.1	8,626.5	113.9
H-3F01	40	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	489.0	8.7	720.0	12.8	1,929.0	34.3	744.0	13.2	612.0	10.9	720.0	12.8	2,076.0	37.0	736.0	13.1	720.0	12.8	744.0	13.2	2,200.0	39.2	8,364.0	148.9
~~H-1E01~~	~~41~~	~~gas~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
H-1F01	43	gas	744.0	10.0	672.0	9.1	743.0	10.0	2,159.0	29.1	720.0	9.7	660.0	8.9	0.0		1,380.0	18.6	744.0	10.0	744.0	10.0	720.0	9.7	2,208.0	29.8	744.0	10.0	721.0	9.7	744.0	10.0	2,209.0	29.8	7,956.0	107.4
H-1G01	44	gas	744.0	10.0	672.0	9.1	743.0	10.0	2,159.0	29.1	720.0	9.7	732.0	9.9	593.0	8.0	2,045.0	27.6	655.5	8.8	744.0	10.0	720.0	9.7	2,119.5	28.6	744.0	10.0	720.0	9.7	744.0	10.0	2,208.0	29.8	8,531.5	115.2
H-1F-1901	45	gas	744.0	11.1	672.0	10.0	743.0	11.1	2,159.0	32.2	696.0	10.4	744.0	11.1	720.0	10.7	2,160.0	32.2	727.5	10.8	744.0	11.1	720.0	10.7	2,191.5	32.7	744.0	11.1	721.0	10.7	744.0	11.1	2,209.0	32.9	8,719.5	129.9
H-1Q01	48	gas	744.0	14.2	458.0	8.7	511.5	9.8	1,713.5	32.7	615.0	11.7	744.0	14.2	720.0	13.8	2,079.0	39.7	744.0	14.2	744.0	14.2	720.0	13.8	2,208.0	42.2	744.0	14.2	721.0	13.8	744.0	14.2	2,209.0	42.2	8,209.5	156.8
H-1R01	49	gas	744.0	11.6	672.0	10.5	743.0	11.6	2,159.0	33.7	648.0	10.1	744.0	11.6	649.0	10.1	2,041.0	31.8	664.0	10.4	744.0	11.6	720.0	11.2	2,128.0	33.2	744.0	11.6	720.0	11.2	744.0	11.6	2,208.0	34.4	8,536.0	133.2
H-1Y01	50	gas	0.0		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0		1.0	0.014	0.0		1.0	0.014	1.0	0.014
Drill Site 1R Well Injection Engines																																				
5010A + 5010B	64 + 65	liquid	43.1	1,000.0	67.7	1,570.0	59.0	1,368.0	169.7	3,938.0	75.4	1,750.0	14.0	325.0		0.0	89.4	2,075.0		0.0		0.0		0.0	0.0	0.0		0.0	30.2	700.0		0.0	30.2	700.0	289.4	6,713.0

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
Fuel Gas H2S Concentration (Except Units 14 & 17)	90.9 ppmv	83.7 ppmv	89.1 ppmv	87.9 ppmv	82.1 ppmv	103.7 ppmv	109.0 ppmv	98.3 ppmv	108.6 ppmv	115.4 ppmv	112.1 ppmv	112.0 ppmv	104.7 ppmv	77.1 ppmv	74.1 ppmv	85.3 ppmv	95.9 ppmv
Fuel Gas H2S Concentration (Units 14 & 17 only)	115.2 ppmv	136.1 ppmv	138.4 ppmv	129.9 ppmv	93.3 ppmv	95.5 ppmv	100.0 ppmv	96.3 ppmv	92.6 ppmv	119.0 ppmv	102.7 ppmv	104.8 ppmv	118.7 ppmv	88.0 ppmv	116.1 ppmv	107.6 ppmv	109.6 ppmv
Flared Gas H2S Concentration	85.8 ppmv	81.8 ppmv	91.1 ppmv	86.3 ppmv	81.7 ppmv	90.1 ppmv	95.1 ppmv	89.0 ppmv	95.5 ppmv	104.2 ppmv	98.5 ppmv	99.4 ppmv	94.3 ppmv	81.8 ppmv	85.6 ppmv	87.2 ppmv	90.5 ppmv
ULSD--Tank 504 Diesel Sulfur Content	0.000000 Wt %	0.000077 Wt %	0.000147 Wt %	0.000075 Wt %	0.000189 Wt %	0.000071 Wt %	0.000099 Wt %	0.000120 Wt %	0.000078 Wt %	0.000073 Wt %	0.000035 Wt %	0.000062 Wt %	0.000023 Wt %	0.000028 Wt %	0.000030 Wt %	0.000027 Wt %	0.000071 Wt %
KUTP LEPD--Tank 501 Diesel Sulfur Content	0.097 Wt %	0.096 Wt %	0.118 Wt %	0.104 Wt %	0.111 Wt %	0.116 Wt %	0.109 Wt %	0.112 Wt %	0.103 Wt %	0.110 Wt %	0.120 Wt %	0.111 Wt %	0.125 Wt %	0.131 Wt %	0.121 Wt %	0.126 Wt %	0.113 Wt %
Sulfur Content used for Emissions Calcs using ULSD fuel →→→	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %
~~**KUTP Regular AHE Diesel Sulfur Content**~~																	
Crude Oil Production (bbl)	2,101,033 bbl	1,905,094 bbl	1,988,262 bbl	5,994,389 bbl	2,015,076 bbl	1,937,493 bbl	1,934,694 bbl	5,887,263 bbl	2,574,511 bbl	2,567,480 bbl	2,149,772 bbl	7,291,763 bbl	2,110,305 bbl	1,631,627 bbl	1,795,273 bbl	5,537,205 bbl	24,710,620 bbl

ConocoPhillips Alaska, Inc. - Central Production Facility No. 2
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number	Unit ID	Fuel Type	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Year: 2014																																				
Gas Turbines																																				
C2-101-A	1	gas	374.5	56.6	0.0	0.0	697.6	105.3	1,072.1	162.0	717.1	103.9	309.2	42.1	611.0	80.0	1,637.3	225.9	649.8	83.0	744.0	97.6	703.3	92.0	2,097.2	272.6	744.0	100.1	721.0	99.0	744.0	108.3	2,209.0	307.4	7,015.5	967.9
C2-101-B	2	gas	522.7	76.3	672.0	101.9	60.6	8.6	1,255.2	186.8	358.0	49.1	545.3	72.8	720.0	92.7	1,623.3	214.7	585.8	73.1	744.0	96.1	714.1	92.2	2,043.8	261.4	744.0	99.0	721.0	98.6	744.0	108.3	2,209.0	305.8	7,131.3	968.6
C2-101-C	3	gas	594.6	97.4	672.0	115.3	743.0	125.2	2,009.6	337.9	720.0	114.9	633.3	92.3	109.6	15.8	1,462.9	223.0	550.2	75.5	744.0	104.9	708.3	100.1	2,002.5	280.5	744.0	108.5	721.0	108.9	744.0	121.0	2,209.0	338.4	7,684.0	1,179.8
G-4202-A	4	gas	744.0	27.1	672.0	25.8	742.0	27.5	2,158.0	80.3	720.0	27.1	533.0	16.5	290.5	9.0	1,543.4	52.6	744.0	27.5	721.3	23.5	720.0	24.7	2,185.3	75.7	744.0	25.0	290.7	11.9	31.0	1.1	1,065.7	37.9	6,952.4	246.6
G-4202-A	4	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-4202-B	5	gas	744.0	28.0	672.0	26.9	742.0	28.6	2,158.0	83.5	720.0	28.6	744.0	22.9	634.7	20.0	2,098.7	71.5	561.0	22.2	739.1	25.2	699.8	25.2	1,999.9	72.6	744.0	26.3	721.0	26.3	744.0	27.9	2,209.0	80.5	8,465.6	308.0
G-4202-B	5	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-4202-C	6	gas	52.0	1.6	72.1	2.8	541.8	20.1	665.8	24.5	364.3	14.2	744.0	23.1	614.3	19.2	1,722.6	56.4	744.0	28.0	184.6	6.2	76.2	2.7	1,004.7	36.9	170.6	5.6	583.2	20.4	744.0	26.6	1,497.8	52.6	4,891.0	170.5
G-4202-C	6	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-4202-D	7	gas	744.0	27.7	600.8	23.0	217.9	8.0	1,562.7	58.7	720.0	28.0	743.6	23.8	526.3	16.8	1,989.9	68.7	587.8	22.3	262.3	8.6	720.0	25.6	1,570.1	56.5	744.0	26.1	721.0	25.9	744.0	27.7	2,209.0	79.6	7,331.8	263.5
G-4202-D	7	liquid	0.0	0.0	0.0	0.0	4.5	1,703.1	4.5	1,703.1	0.0	0.0	0.400	152.4	0.250	95.3	0.650	247.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	1,950.7
G-4202-E	8	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.003	0.0	0.0	1.0	0.003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.003
G-4202-E	8	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G-4202-F	9	gas	744.0	27.2	672.0	26.0	742.0	28.1	2,158.0	81.3	720.0	28.0	744.0	22.8	720.0	22.8	2,184.0	73.6	741.2	27.9	744.0	25.1	720.0	25.2	2,205.2	78.1	744.0	25.8	721.0	25.6	744.0	27.3	2,209.0	78.7	8,756.2	311.7
G-4202-F	9	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P-CM02-A	10	gas	744.0	34.1	672.0	30.8	741.5	34.0	2,157.5	98.8	719.7	33.0	742.9	34.0	720.0	33.0	2,182.6	100.0	744.0	34.1	744.0	34.1	656.3	30.1	2,144.3	98.2	744.0	34.1	721.0	33.0	744.0	34.1	2,209.0	101.2	8,693.4	398.2
P-CM02-B	11	gas	743.4	34.0	672.0	30.8	742.0	34.0	2,157.5	98.8	720.0	33.0	743.6	34.1	720.0	33.0	2,183.6	100.0	744.0	34.1	744.0	34.1	637.9	29.2	2,125.9	97.4	744.0	34.1	721.0	33.0	744.0	34.1	2,209.0	101.2	8,676.0	397.4
P-CM02-C	12	gas	743.6	34.1	672.0	30.8	742.0	34.0	2,157.6	98.8	720.0	33.0	742.7	34.0	720.0	33.0	2,182.7	100.0	731.3	33.5	744.0	34.1	630.2	28.9	2,105.5	96.4	700.8	32.1	721.0	33.0	744.0	34.1	2,165.8	99.2	8,611.6	394.4
P-CM02-D	13	gas	728.2	33.4	672.0	30.8	742.0	34.0	2,142.2	98.1	643.1	29.5	710.3	32.5	720.0	33.0	2,073.4	95.0	744.0	34.1	744.0	34.1	629.8	28.8	2,117.8	97.0	743.5	34.1	714.3	32.7	744.0	34.1	2,201.8	100.8	8,535.2	390.9
P-CM02-D	13	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas-Fired Heaters (Excluding Drill Site Heaters)																																				
H-4201	14	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H-4201	14	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diesel-Fired Equipment > 600 hp																																				
G-4201-A	15	liquid	1.8	97.8	0.580	32.6	0.580	32.6	2.9	163.0	0.670	37.3	0.580	32.6	0.580	32.6	1.8	102.5	0.0	0.0	0.500	28.0	0.580	32.6	1.1	60.6	0.750	41.9	0.0	0.0	2.0	111.8	2.8	153.7	8.6	479.8
G-4201-B	16	liquid	1.8	97.8	0.580	32.6	0.500	28.0	2.8	158.4	0.670	37.3	0.750	41.9	0.670	37.3	2.1	116.5	0.0	0.0	1.3	69.9	0.580	32.6	1.8	102.5	0.670	37.3	0.0	0.0	1.2	65.2	1.8	102.5	8.6	479.8
Diesel-Fired Equipment < 600 hp																																				
P-4205	17	liquid	1.2	14.1	1.6	19.2	1.9	22.9	4.7	56.2	1.9	23.2	1.9	23.2	3.3	39.3	7.1	85.7	1.6	19.2	1.3	16.1	1.4	17.1	4.3	52.4	2.0	24.2	2.0	24.5	1.9	23.2	5.9	71.8	22.0	266.2
P-CM04	18	liquid	0.500	6.1	1.0	12.1	0.670	8.1	2.2	26.2	1.1	13.7	0.250	3.0	1.2	14.1	2.6	30.9	1.8	21.2	0.670	8.1	1.7	20.2	4.1	49.4	0.830	10.1	2.3	28.2	1.0	12.1	4.2	50.4	13.0	156.9
Pumps	19-29	liquid	2.5	37.9	2.5	38.6	4.9	76.2	9.9	152.6	1.5	23.2	7.1	109.7	0.900	13.9	9.5	146.8	0.750	11.6	1.9	29.2	1.0	15.5	3.6	56.2	0.0	0.0	1.0	15.5	22.3	344.5	23.3	360.0	46.3	715.6
Flares			744.0		672.0		743.0		2,159.0		720.0		744.0		720.0		2,184.0		744.0		744.0		672.0		2,160.0		528.0		721.0		744.0		1,993.0		8,496.0	
H-101A	30	gas	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		48.0		48.0		216.0		0.0		0.0		216.0		264.0	
H-KM01	31	gas	744.0	18.7	672.0	16.8	743.0	22.8	2,159.0	58.3	720.0	22.7	744.0	28.0	720.0	18.5	2,184.0	69.1	744.0	22.6	744.0	25.1	672.0	22.3	2,160.0	70.1	528.0	14.9	721.0	20.0	744.0	22.4	1,993.0	57.3	8,496.0	254.9
H-KM02	32	gas	744.0		672.0		743.0		2,159.0		720.0		744.0		720.0		2,184.0		744.0		744.0		672.0		2,160.0		528.0		721.0		744.0		1,993.0		8,496.0	
Other Equipment (Drill Site Heaters)																																				
H-2A01	33	gas	744.0	10.0	646.5	8.7	743.0	10.0	2,133.5	28.8	720.0	9.7	744.0	10.0	720.0	9.7	2,184.0	29.5	744.0	10.0	744.0	10.0	720.0	9.7	2,208.0	29.8	744.0	10.0	720.0	9.7	744.0	10.0	2,208.0	29.8	8,733.5	117.9
H-2B01	34	gas	744.0	10.4	660.0	9.2	743.0	10.4	2,147.0	30.1	628.0	8.8	744.0	10.4	636.0	8.9	2,008.0	28.1	744.0	10.4	744.0	10.4	720.0	10.1	2,208.0	30.9	744.0	10.4	720.0	10.1	720.0	10.1	2,184.0	30.6	8,547.0	119.7
H-2C01	35	gas	0.0		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0		1.0	0.014	648.0	8.7	649.0	8.8	649.0	8.8
H-2D01	36	gas	744.0	9.8	672.0	8.9	743.0	9.8	2,159.0	28.5	648.0	8.6	744.0	9.8	696.0	9.2	2,088.0	27.6	744.0	9.8	744.0	9.8	720.0	9.5	2,208.0	29.1	744.0	9.8	720.0	9.5	744.0	9.8	2,208.0	29.1	8,663.0	114.4
H-2E01	37	gas	744.0	2.0	672.0	1.8	743.0	2.0	2,159.0	5.8	720.0	1.9	744.0	2.0	692.0	1.9	2,156.0	5.8	744.0	2.0	744.0	2.0	708.0	1.9	2,196.0	5.9	66.0	0.178	720.0	1.9	744.0	2.0	1,530.0	4.1	8,041.0	21.7
H-2F01	38	gas	744.0	9.8	672.0	8.9	743.0	9.8	2,159.0	28.5	720.0	9.5	744.0	9.8	720.0	9.5	2,184.0	28.8	744.0	9.8	744.0	9.8	720.0	9.5	2,208.0	29.1	744.0	9.8	676.5	8.9	744.0	9.8	2,164.5	28.6	8,715.5	115.0
H-2G01	39	gas	0.0		456.0	6.0	743.0	9.8	1,199.0	15.8	712.0	9.4	744.0	9.8	720.0	9.5	2,176.0	28.7	744.0	9.8	744.0	9.8	720.0	9.5	2,208.0	29.1	744.0	9.8	720.0	9.5	734.0	9.7	2,198.0	29.0	7,781.0	102.7
H-2H01	40	gas	744.0	10.0	672.0	9.1	743.0	10.0	2,159.0	29.1	720.0	9.7	744.0	10.0	720.0	9.7	2,184.0	29.5	744.0	10.0	744.0	10.0	720.0	9.7	2,208.0	29.8	744.0	10.0	720.0	9.7	744.0	10.0	2,208.0	29.8	8,759.0	118.2
H-K04-01	41	gas	744.0	13.4	672.0	12.1	743.0	13.4	2,159.0	38.9	720.0	13.0	744.0	13.4	720.0	13.0	2,184.0	39.3	744.0	13.4	744.0	13.4	720.0	13.0	2,208.0	39.7	744.0	13.4	720.0	13.0	744.0	13.4	2,208.0	39.7	8,759.0	157.7
H-K05-01	42	gas	744.0	13.4	672.0	12.1	743.0	13.4	2,159.0	38.9	720.0	13.0	744.0	13.4	720.0	13.0	2,184.0	39.3	744.0	13.4	744.0	13.4	720.0	13.0	2,208.0	39.7	744.0	13.4	720.0	13.0	744.0	13.4	2,208.0	39.7	8,759.0	157.7
H-3M01	43	gas	576.0	10.2	663.0	11.7	743.0	13.2	1,982.0	35.1	720.0	12.7	744.0	13.2	720.0	12.7	2,184.0	38.7	744.0	13.2	744.0	13.2	720.0	12.7	2,208.0	39.1	744.0	13.2	720.0	12.7	744.0	13.2	2,208.0	39.1	8,582.0	151.9
H-2U01	44	gas	744.0	10.0	628.0	8.5	743.0	10.0	2,115.0	28.6	720.0	9.7	744.0	10.0	720.0	9.7	2,184.0	29.5	744.0	10.0	744.0	10.0	720.0	9.7	2,208.0	29.8	744.0	10.0	696.0	9.4	744.0	10.0	2,184.0	29.5	8,691.0	117.3
H-2W01	45	gas	744.0	16.1	672.0	14.6	743.0	16.1	2,159.0	46.9	720.0	15.6	744.0	16.1	720.0	15.6	2,184.0	47.4	698.0	15.1	744.0	16.1	720.0	15.6	2,162.0	46.9	744.0	16.1	720.0	15.6	709.0	15.4	2,173.0	47.2	8,678.0	188.3
H-2X01	46	gas	744.0	13.1	672.0	11.8	743.0	13.1	2,159.0	38.0	720.0	12.7	744.0	13.1	720.0	12.7	2,184.0	38.4	696.0	12.2	744.0	13.1	720.0	12.7	2,160.0	38.0	744.0	13.1	720.0	12.7	744.0	13.1	2,208.0	38.9	8,711.0	153.3
H-2Z01	47	gas	0.0		0.0		0.0		0.0	0.0	0.0		24.0	0.422	0.0		24.0	0.422	0.0		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	24.0	0.422

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
Fuel Gas H_2S Concentration	100.0 ppmv	100.0 ppmv	100.0 ppmv	100.0 ppmv	87.1 ppmv	96.1 ppmv	100.0 ppmv	94.4 ppmv	85.0 ppmv	98.5 ppmv	78.9 ppmv	87.5 ppmv	88.7 ppmv	82.2 ppmv	80.0 ppmv	83.6 ppmv	91.4 ppmv
ULSD--Tank 504 Diesel Sulfur Content	0.000000 Wt %	0.000077 Wt %	0.000147 Wt %	0.000075 Wt %	0.000189 Wt %	0.000071 Wt %	0.000099 Wt %	0.000120 Wt %	0.000078 Wt %	0.000073 Wt %	0.000035 Wt %	0.000062 Wt %	0.000023 Wt %	0.000028 Wt %	0.000030 Wt %	0.000027 Wt %	0.000071 Wt %
KUTP LEPD--Tank 501 Diesel Sulfur Content	0.097 Wt %	0.096 Wt %	0.118 Wt %	0.104 Wt %	0.111 Wt %	0.116 Wt %	0.109 Wt %	0.112 Wt %	0.103 Wt %	0.110 Wt %	0.120 Wt %	0.111 Wt %	0.125 Wt %	0.131 Wt %	0.121 Wt %	0.126 Wt %	0.113 Wt %
Sulfur Content used for Emissions Calcs using ULSD fuel →→→	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %
~~KUTP Regular AHE Diesel Sulfur Content~~																	

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
Crude Oil Production (bbl)	1,579,787 bbl	1,299,809 bbl	1,741,159 bbl	4,620,755 bbl	1,841,481 bbl	2,010,199 bbl	1,434,490 bbl	5,286,170 bbl	1,247,671 bbl	1,281,983 bbl	1,439,680 bbl	3,969,334 bbl	1,678,097 bbl	1,920,143 bbl	1,837,034 bbl	5,435,274 bbl	19,311,533 bbl

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number	Unit ID	Fuel Type	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Year: 2014																																				
Gas Turbines																																				
C-EF01-A	1	gas	744.0	103.8	408.8	57.9	740.5	105.3	1,893.3	266.9	720.0	99.2	744.0	96.9	655.8	83.5	2,119.7	279.5	744.0	95.4	744.0	95.2	720.0	93.3	2,208.0	283.9	734.8	98.6	721.0	101.4	744.0	107.4	2,199.8	307.4	8,420.7	1,137.8
C-EF01-B	2	gas	744.0	102.7	608.8	88.6	743.0	104.5	2,095.8	295.9	720.0	98.4	744.0	96.4	640.0	81.3	2,104.0	276.0	744.0	94.2	744.0	94.1	720.0	92.6	2,208.0	280.8	664.5	88.4	311.3	43.6	744.0	104.8	1,719.8	236.7	8,127.5	1,089.4
G-EF01-A	3	gas	331.5	3.6	56.8	0.675	23.8	0.654	412.0	5.0	330.3	10.9	0.750	0.011	5.0	0.056	336.0	10.9	574.0	20.1	64.0	2.3	111.8	2.4	749.8	24.7	112.0	1.0	206.3	6.3	107.5	1.4	425.8	8.7	1,923.5	49.3
P-EF52-A	4	gas	744.0	32.1	672.0	29.2	655.8	25.8	2,071.8	87.1	481.8	19.1	742.5	29.3	636.0	24.2	1,860.2	72.5	533.5	20.6	670.0	26.1	583.8	23.6	1,787.3	70.4	737.0	30.0	711.0	28.4	739.5	30.1	2,187.5	88.4	7,906.7	318.5
P-EF52-B	5	gas	741.0	30.2	670.8	27.3	743.0	30.3	2,154.8	87.7	395.3	15.0	742.8	27.2	561.0	20.2	1,699.0	62.4	714.3	25.8	744.0	27.3	653.5	24.6	2,111.8	77.8	744.0	28.3	721.0	27.9	744.0	29.9	2,209.0	86.1	8,174.5	314.1
G-EF03	6	gas	744.0	178.2	672.0	160.8	741.8	190.1	2,157.8	529.2	710.5	172.2	744.0	188.4	720.0	175.3	2,174.5	535.9	187.8	44.0	675.5	164.4	713.0	169.0	1,576.3	377.4	744.0	176.1	721.0	175.6	744.0	174.1	2,209.0	525.9	8,117.5	1,968.3
Dual-Fuel Fired Heaters																																				
H-EF03	7	gas	0.250	0.001	0.0	0.0	0.0	0.002	0.250	0.003	0.0	0.0	0.0	0.0	63.8	0.525	63.8	0.525	0.0	0.002	0.0	0.0	0.0	0.0	0.0	0.002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.0	0.530
H-EF03	7	liquid	0.170	2.7	0.0	0.0	0.0	0.0	0.170	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.170	2.7
Gas-Fired Heaters (Excluding Drill Site Heaters)																																				
H-EF04	8	gas	744.0	2.1	672.0	1.8	741.8	1.9	2,157.8	5.8	710.5	1.7	744.0	1.8	720.0	1.5	2,174.5	5.0	187.8	0.369	675.5	1.3	713.0	1.4	1,576.3	3.1	744.0	1.6	721.0	1.6	744.0	1.5	2,209.0	4.6	8,117.5	18.6
Diesel-Fired Equipment < 600 hp																																				
P-EF24B	9	liquid	3.3	72.2	0.750	16.7	2.3	50.0	6.3	138.8	1.3	27.8	0.750	16.7	0.500	11.1	2.5	55.5	0.250	5.6	1.8	38.9	0.750	16.7	2.8	61.1	0.250	5.6	0.0	0.0	1.0	22.2	1.3	27.8	12.8	283.1
P-EF53	10	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flares			744.0		672.0		743.0		2,159.0		720.0		744.0		720.0		2,184.0		744.0		744.0		720.0		2,208.0		696.0		721.0		485.5		1,902.5		8,453.5	
H-EF01B	11	gas	0.0	17.2	0.0	16.1	0.0	20.5	0.0	53.7	0.0	17.6	0.0	17.1	0.0	17.7	0.0	52.4	0.0	15.6	0.0	17.1	0.0	17.5	0.0	50.2	696.0	4.0	721.0	19.2	258.5	14.8	1,675.5	37.9	1,675.5	194.2
H-EB02B	12	gas	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		696.0		721.0		258.5		1,675.5		1,675.5	
H-EF05	13	gas	744.0		672.0		743.0		2,159.0		720.0		744.0		720.0		2,184.0		744.0		744.0		720.0		2,208.0		48.0		0.0		485.5		533.5		7,084.5	
H-EF06	14	gas	744.0		672.0		743.0		2,159.0		720.0		744.0		720.0		2,184.0		744.0		744.0		720.0		2,208.0		48.0		0.0		485.5		533.5		7,084.5	
Other Equipment (Drill Site Heaters)																																				
H-3A01	15	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	744.0	13.2	720.0	12.8	2,184.0	38.9	744.0	13.2	744.0	13.2	720.0	12.8	2,208.0	39.3	744.0	13.2	721.0	12.8	744.0	13.2	2,209.0	39.3	8,760.0	155.9
H-3B01	16	gas	372.0	6.6	336.0	6.0	372.0	6.6	1,080.0	19.2	360.0	6.4	480.0	8.5	720.0	12.8	1,560.0	27.8	744.0	13.2	744.0	13.2	720.0	12.8	2,208.0	39.3	744.0	13.2	721.0	12.8	744.0	13.2	2,209.0	39.3	7,057.0	125.6
H-3C01	17	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	744.0	13.2	720.0	12.8	2,184.0	38.9	744.0	13.2	721.0	12.8	720.0	12.8	2,185.0	38.9	744.0	13.2	721.0	12.8	744.0	13.2	2,209.0	39.3	8,737.0	155.5
H-K06-01	18	gas	744.0	13.5	672.0	12.2	743.0	13.4	2,159.0	39.1	720.0	13.0	744.0	13.5	720.0	13.0	2,184.0	39.5	744.0	13.5	744.0	13.5	720.0	13.0	2,208.0	40.0	744.0	13.5	721.0	13.1	744.0	13.5	2,209.0	40.0	8,760.0	158.6
H-K02-01	19	gas	744.0	13.5	672.0	12.2	743.0	13.4	2,159.0	39.1	720.0	13.0	696.0	12.6	720.0	13.0	2,136.0	38.7	744.0	13.5	744.0	13.5	720.0	13.0	2,208.0	40.0	744.0	13.5	721.0	13.1	744.0	13.5	2,209.0	40.0	8,712.0	157.7
H-3I01	20	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	744.0	13.2	720.0	12.8	2,184.0	38.9	744.0	13.2	744.0	13.2	720.0	12.8	2,208.0	39.3	744.0	13.2	721.0	12.8	744.0	13.2	2,209.0	39.3	8,760.0	155.9
H-3J01	21	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	744.0	13.2	720.0	12.8	2,184.0	38.9	744.0	13.2	744.0	13.2	720.0	12.8	2,208.0	39.3	744.0	13.2	721.0	12.8	744.0	13.2	2,209.0	39.3	8,760.0	155.9
H-3K01	22	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	744.0	13.2	622.0	11.1	2,086.0	37.1	744.0	13.2	689.0	12.3	615.0	10.9	2,048.0	36.5	635.5	11.3	717.5	12.8	744.0	13.2	2,097.0	37.3	8,390.0	149.3
H-K01-01	23	gas	744.0	13.5	672.0	12.2	743.0	13.4	2,159.0	39.1	720.0	13.0	744.0	13.5	690.0	12.5	2,154.0	39.0	744.0	13.5	744.0	13.5	720.0	13.0	2,208.0	40.0	744.0	13.5	721.0	13.1	744.0	13.5	2,209.0	40.0	8,730.0	158.0
H-3N01	24	gas	744.0	13.2	672.0	12.0	743.0	13.2	2,159.0	38.4	720.0	12.8	744.0	13.2	720.0	12.8	2,184.0	38.9	692.5	12.3	712.5	12.7	720.0	12.8	2,125.0	37.8	744.0	13.2	721.0	12.8	744.0	13.2	2,209.0	39.3	8,677.0	154.5
H-K03-01	25	gas	744.0	13.5	672.0	12.2	743.0	13.4	2,159.0	39.1	720.0	13.0	744.0	13.5	624.0	11.3	2,088.0	37.8	744.0	13.5	566.0	10.2	0.0		1,310.0	23.7	144.0	2.6	468.0	8.5	744.0	13.5	1,356.0	24.5	6,913.0	125.1
H-3Q01	26	gas	744.0	13.2	600.0	10.7	402.0	7.2	1,746.0	31.1	720.0	12.8	744.0	13.2	616.0	11.0	2,080.0	37.0	744.0	13.2	680.0	12.1	570.0	10.1	1,994.0	35.5	589.0	10.5	716.0	12.7	744.0	13.2	2,049.0	36.5	7,869.0	140.1
H-K07-01	27	gas	744.0	4.1	672.0	3.8	743.0	4.0	2,159.0	12.0	720.0	3.8	744.0	3.7	612.0	2.8	2,076.0	10.3	744.0	3.8	644.0	3.3	390.0	2.9	1,778.0	9.9	403.0	5.5	710.0	4.0	744.0	4.5	1,857.0	14.0	7,870.0	46.2

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
Fuel Gas H_2S Concentration	134.8 ppmv	146.1 ppmv	155.5 ppmv	145.5 ppmv	157.3 ppmv	143.9 ppmv	147.2 ppmv	149.4 ppmv	135.3 ppmv	149.1 ppmv	128.9 ppmv	137.8 ppmv	120.4 ppmv	120.0 ppmv	102.2 ppmv	114.2 ppmv	136.7 ppmv
ULSD--Tank 504 Diesel Sulfur Content	0.000000 Wt %	0.000077 Wt %	0.000147 Wt %	0.000075 Wt %	0.000189 Wt %	0.000071 Wt %	0.000099 Wt %	0.000120 Wt %	0.000078 Wt %	0.000073 Wt %	0.000035 Wt %	0.000062 Wt %	0.000023 Wt %	0.000028 Wt %	0.000030 Wt %	0.000027 Wt %	0.000071 Wt %
KUTP LEPD--Tank 501 Diesel Sulfur Content	0.097 Wt %	0.096 Wt %	0.118 Wt %	0.104 Wt %	0.111 Wt %	0.116 Wt %	0.109 Wt %	0.112 Wt %	0.103 Wt %	0.110 Wt %	0.120 Wt %	0.111 Wt %	0.125 Wt %	0.131 Wt %	0.121 Wt %	0.126 Wt %	0.113 Wt %
Sulfur Content used for Emissions Calcs using ULSD fuel →→→	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %
KUTP Regular AHF Diesel Sulfur Content																	

Crude Oil Production (bbl)																	

ConocoPhillips Alaska, Inc. - Kuparuk Seawater Treatment Plant
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number	Unit ID	Fuel Type (Year: 2014)	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons
Gas Turbines																		
Gas Turbines I																		
G-CJ33-A	1	gas	704.5	17.8	633.0	17.8	585.0	16.1	1,922.5	51.7	501.0	15.3	467.5	13.3	720.0	19.7	1,688.5	48.2
G-CJ33-B	2	gas	690.0	19.5	195.0	5.5	652.5	17.5	1,537.5	42.5	718.0	23.0	276.0	8.4	94.0	2.7	1,088.0	34.2
Gas-Fired Heaters																		
Gas Heaters II				129.9		110.9		119.0				100.3		79.5		68.9		
H-CJ31-A	3	gas	744.0	30.9	672.0	29.2	743.0	28.5	2,159.0	88.5	720.0	20.8	744.0	19.3	135.0	4.4	1,599.0	44.5
H-CJ31-B	4	gas	744.0	30.9	672.0	29.2	743.0	28.5	2,159.0	88.5	720.0	20.8	744.0	19.3	627.0	20.3	2,091.0	60.4
H-CJ31-C	5	gas	744.0	30.9	672.0	29.2	743.0	28.5	2,159.0	88.5	705.0	20.4	744.0	19.3	679.0	22.0	2,128.0	61.6
Diesel-Fired Equipment																		
Diesel Equipment III																		
G-CJ35 (Removed)	6	liquid																
P-CK31A	7	liquid	2.0	10.2	1.0	5.1	23.0	117.3	26.0	132.6	0.0	0.0	0.500	2.6	1.0	5.1	1.5	7.7

Tag Number	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Gas Turbines																		
Gas Turbines I																		
G-CJ33-A	744.0	21.4	432.0	12.7	499.0	13.9	1,675.0	47.9	271.5	8.4	362.0	11.0	289.3	7.7	922.8	27.1	6,208.7	174.9
G-CJ33-B	572.8	17.7	158.0	2.2	125.0	4.1	855.8	24.0	640.5	21.3	561.0	17.7	743.5	22.3	1,945.0	61.3	5,426.2	161.9
Gas-Fired Heaters																		
Gas Heaters II		69.5		33.3		63.8				109.0		121.5		140.7				
H-CJ31-A	744.0	16.7	433.0	8.0	0.0	0.0	1,177.0	24.7	534.5	21.1	721.0	31.0	744.0	36.9	1,999.5	89.0	6,934.5	246.7
H-CJ31-B	142.0	3.2	277.0	5.1	581.8	23.3	1,000.8	31.6	736.5	29.1	721.0	31.0	744.0	36.9	2,201.5	96.9	7,452.2	277.5
H-CJ31-C	469.5	10.5	288.0	5.3	562.0	22.5	1,319.5	38.4	736.5	29.1	721.0	31.0	744.0	36.9	2,201.5	96.9	7,808.0	285.5
Diesel-Fired Equipment																		
Diesel Equipment III																		
G-CJ35 (Removed)																		
P-CK31A	1.0	5.1	0.0	0.0	1.0	5.1	2.0	10.2	0.0	0.0	0.500	2.6	11.5	58.7	12.0	61.2	41.5	211.7

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
Fuel Gas H_2S Concentration (Units 1 & 2)	130.0 ppmv	142.1 ppmv	150.0 ppmv	140.7 ppmv	157.3 ppmv	144.5 ppmv	147.0 ppmv	149.6 ppmv	144.2 ppmv	130.0 ppmv	129.3 ppmv	134.5 ppmv	120.0 ppmv	112.7 ppmv	113.4 ppmv	115.4 ppmv	135.1 ppmv
Fuel Gas H_2S Concentration (Units 3, 4 ,5)	51.3 ppmv	49.2 ppmv	49.9 ppmv	50.1 ppmv	55.0 ppmv	48.1 ppmv	31.5 ppmv	44.9 ppmv	22.2 ppmv	9.8 ppmv	12.6 ppmv	14.9 ppmv	40.6 ppmv	50.4 ppmv	40.5 ppmv	43.8 ppmv	38.4 ppmv
ULSD--Tank 504 Diesel Sulfur Content	0.000000 Wt %	0.000077 Wt %	0.000147 Wt %	0.000075 Wt %	0.000189 Wt %	0.000071 Wt %	0.000099 Wt %	0.000120 Wt %	0.000078 Wt %	0.000073 Wt %	0.000035 Wt %	0.000062 Wt %	0.000023 Wt %	0.000028 Wt %	0.000030 Wt %	0.000027 Wt %	0.000071 Wt %
KUTP LEPD--Tank 501 Diesel Sulfur Content	0.097 Wt %	0.096 Wt %	0.118 Wt %	0.104 Wt %	0.111 Wt %	0.116 Wt %	0.109 Wt %	0.112 Wt %	0.103 Wt %	0.110 Wt %	0.120 Wt %	0.111 Wt %	0.125 Wt %	0.131 Wt %	0.121 Wt %	0.126 Wt %	0.113 Wt %
Sulfur Content used for Emissions Calcs using ULSD fuel→→→	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %
~~KUTP Regular AHF Diesel Sulfur Content~~																	

ConocoPhillips Alaska, Inc. - Central Production Facility No. 1 - DS1E / DS1J
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number	Unit ID	Fuel Type	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons
Year: 2014																		
Rig Engines																		
Engines	58	liquid		11,921.0		0.0		0.0		11,921.0		0.0		0.0		390.0		390.0
Rig Boilers and Heaters																		
Boilers/Heaters	59	liquid		23,453.0		0.0		0.0		23,453.0		0.0		0.0		330.0		330.0
Rig Camp Engines																		
Camp Engines	60	liquid		1,064.0		0.0		0.0		1,064.0		0.0		0.0		0.0		0.0
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																		
Well Service Heaters	61	liquid	97.9	7,505.0	45.2	3,463.0	72.3	5,544.0	215.4	16,512.0	108.8	8,338.0	26.9	2,065.0	205.0	15,711.0	340.7	26,114.0
Well Service Engines	62	liquid	41.9	1,607.0	18.9	726.0	36.1	1,386.0	96.9	3,719.0	66.0	2,532.0	39.1	1,501.0	110.7	4,246.0	215.8	8,279.0
Well Frac Unit Engines	63	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DS1E and DS1J Permanent Operation Equipment																		
H-1E02	42	gas	744.0	3.5	672.0	2.2	721.0	2.6	2,137.0	8.3	720.0	1.3	742.5	1.2	720.0	1.0	2,182.5	3.6
H-1J01A	46	gas	743.8	5.6	669.8	5.1	719.2	5.5	2,132.8	16.2	706.4	5.4	744.0	5.7	718.6	5.5	2,169.0	16.5
H-1J01B	47	gas	743.8	5.1	669.8	4.6	718.8	4.9	2,132.5	14.6	706.7	4.8	744.0	5.0	718.6	4.8	2,169.3	14.5
Portable Flare (PF1)	34	gas								0.0								0.0

Tag Number	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Rig Engines																		
Engines		0.0		0.0		0.0		0.0		0.0		2,266.0		0.0		2,266.0		14,577.0
Rig Boilers and Heaters																		
Boilers/Heaters		58.0		0.0		0.0		58.0		0.0		9,247.0		0.0		9,247.0		33,088.0
Rig Camp Engines																		
Camp Engines		0.0		0.0		0.0		0.0		0.0		65.0		0.0		65.0		1,129.0
Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Units																		
Well Service Heaters	4.2	319.0	92.1	7,060.0	50.6	3,877.0	146.8	11,256.0	22.7	1,742.0	170.4	13,065.0	87.0	6,672.0	280.2	21,479.0	983.1	75,361.0
Well Service Engines	74.5	2,858.0	119.7	4,594.0	36.9	1,415.0	231.1	8,867.0	23.1	885.0	49.8	1,909.0	33.1	1,271.0	106.0	4,065.0	649.8	24,930.0
Well Frac Unit Engines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DS1E and DS1J Permanent Operation Equipment																		
H-1E02	739.0	1.3	692.0	1.9	710.0	1.8	2,141.0	5.0	742.0	1.5	577.0	1.0	201.0	0.530	1,520.0	3.1	7,980.5	19.8
H-1J01A	743.0	5.6	730.1	5.5	718.3	5.4	2,191.4	16.5	733.3	5.5	703.0	5.4	743.5	5.6	2,179.8	16.5	8,672.9	65.8
H-1J01B	742.8	4.9	730.5	4.8	718.3	4.7	2,191.5	14.4	733.1	4.8	703.0	5.0	743.5	5.1	2,179.6	14.8	8,672.9	58.4
Portable Flare (PF1)								0.0								0.0		0.0

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
CPF1 Fuel Gas H_2S (All Units except 14 & 17)	90.9 ppmv	83.7 ppmv	89.1 ppmv	87.9 ppmv	82.1 ppmv	103.7 ppmv	109.0 ppmv	98.3 ppmv	108.6 ppmv	115.4 ppmv	112.1 ppmv	112.0 ppmv	104.7 ppmv	77.1 ppmv	74.1 ppmv	85.3 ppmv	95.9 ppmv
ULSD--Tank 504 Diesel Sulfur Content	0.000000 Wt %	0.000077 Wt %	0.000147 Wt %	0.000075 Wt %	0.000189 Wt %	0.000071 Wt %	0.000099 Wt %	0.000120 Wt %	0.000078 Wt %	0.000073 Wt %	0.000035 Wt %	0.000062 Wt %	0.000023 Wt %	0.000028 Wt %	0.000030 Wt %	0.000027 Wt %	0.000071 Wt %
KUTP LEPD--Tank 501 Diesel Sulfur Content	0.097 Wt %	0.096 Wt %	0.118 Wt %	0.104 Wt %	0.111 Wt %	0.116 Wt %	0.109 Wt %	0.112 Wt %	0.103 Wt %	0.110 Wt %	0.120 Wt %	0.111 Wt %	0.125 Wt %	0.131 Wt %	0.121 Wt %	0.126 Wt %	0.113 Wt %
Sulfur Content used for Emissions Calcs using ULSD fuel →→→	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %	0.000300 Wt %

	January	February	March	1Q Total	April	May	June	2Q Total	July	August	September	3Q Total	October	November	December	4Q Total	Annual Total
DS1E Temporary Crude Oil Storage Tank Monthly VOC emissions	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons
DS1J Temporary Crude Oil Storage Tank Monthly VOC emissions	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons	0.000 tons

ConocoPhillips Alaska, Inc. - Central Production Facility No. 3 - Black Start Engine
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number	Unit ID	Fuel Type	January hrs	January fuel Gallons	February hrs	February fuel Gallons	March hrs	March fuel Gallons	1Q Total hrs	1Q Total fuel Gallons	April hrs	April fuel Gallons	May hrs	May fuel Gallons	June hrs	June fuel Gallons	2Q Total hrs	2Q Total fuel Gallons
	Year:	2014																
Diesel-Fired Equipment < 600 hp																		
PED-4005	43	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	52.5	0.0	0.0	0.0	0.0	3.0	52.5

Tag Number	July hrs	July fuel Gallons	August hrs	August fuel Gallons	September hrs	September fuel Gallons	3Q Total hrs	3Q Total fuel Gallons	October hrs	October fuel Gallons	November hrs	November fuel Gallons	December hrs	December fuel Gallons	4Q Total hrs	4Q Total fuel Gallons	Annual Total hrs	Annual Total fuel Gallons
Diesel-Fired Equipment < 600 hp																		
PED-4005	0.500	8.8	0.0	0.0	0.0	0.0	0.500	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	61.3

Attachment No. 2

Kuparuk River Unit Transportable Drilling Rigs

ConocoPhillips Alaska, Inc.
Kuparuk Transportable Drilling Rigs
Total Actual Emissions Summary

Rolling 12-Month Period Ending
December 2014

Pollutant	Emission Factor (pounds/gallon)	Fuel Use Rolling 12-Month Total (gallons)	Emissions Rolling 12-Month Total (tons)
CO	0.096	909,522	43.7
NOx	0.318		144.6
PM10	0.00529		2.4
SO2	0.01790		8.1
VOC	0.0101		4.6
		Sum Total =	**188**

Notes:

1. Emission factors from Title V Air Quality Permit Application - Kuparuk River Unit In-Field Drilling dated July 2005. Emission factors for pollutants not addressed in the application have been developed using an equivalent methodology.

2. SO2 emissions are calculated using the maximum measured fuel sulfur content during the reporting perio **0.131** weight percent.

Attachment No. 3

Alpine Processing Facility

ConocoPhillips Alaska, Inc.

Total Quarterly and Annual Actual Emissions Summary

(With Portable Heaters & Boilers, Temporary Crude Oil Storage Tank VOC, Other Storage Tank VOC, and Well Flowback VOC; Does not include drill rig or well service/ frac unit nonroad engines)

Alpine Central Processing Facility

Version 2014.5

2014							
					Total		
Pollutant	1st Quarter (tons)	2nd Quarter (tons)	3rd Quarter (tons)	4th Quarter (tons)	Total (tpy)	Well Flowback (tpy)	Grand Total (tpy)
NO_x	247.1	253.2	227.4	232.6	960.4	n/a	960.4
CO	48.7	40.2	44.5	44.2	177.5	n/a	177.5
VOC	5.9	5.0	5.2	3.7	19.7	0.8	20.5
SO_2	5.2	4.6	3.7	4.0	17.6	n/a	17.6
PM_{10}	7.7	7.2	6.4	7.3	28.6	n/a	28.6
						Sum Total =	1,205

H2S ppmv	40.0	37.2	31.6	31.1
Sulfur Content (ppmw)	3.0	3.0	3.0	3.0

ConocoPhillips Alaska, Inc.

Total Monthly Actual VOC Emissions Summary

Alpine Central Processing Facility

2014

Version 2014.5

CD1, CD2, CD3, & CD4 Temporary Crude Oil Storage Tanks

Location	Jan (tons)	Feb (tons)	Mar (tons)	Apr (tons)	May (tons)	Jun (tons)	Jul (tons)	Aug (tons)	Sep (tons)	Oct (tons)	Nov (tons)	Dec (tons)	Calendar Year Total (tons)
Combined Total CD1 through CD4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number (Year: 2014)	Unit ID	Fuel Type	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons
Gas Turbines																		
CF-C-33012-TB (C1)	1	gas	744.0	206.0	672.0	183.5	733.8	202.9	2,149.8	592.5	720.0	194.0	744.0	205.0	720.0	194.3	2,184.0	593.3
CF-G-70001-TB (E1)	2	gas	744.0	149.9	671.9	134.7	739.8	154.7	2,155.7	439.3	720.0	149.0	744.0	143.7	720.0	134.7	2,184.0	427.5
CF-G-70002-TB (E2)	3	gas	744.0	47.9	671.9	43.5	738.9	46.6	2,154.8	137.9	586.8	37.4	744.0	47.8	562.3	36.0	1,893.0	121.2
~~CF-G-70002-TB~~	~~3~~	~~liquid~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	gas	0.809	0.037	0.606	0.028	0.749	0.030	2.2	0.095	32.3	1.4	3.9	0.152	153.0	6.8	189.2	8.4
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	gas	0.357	0.017	143.6	6.6	16.1	0.649	160.0	7.2	0.384	0.017	0.928	0.036	0.229	0.010	1.5	0.063
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**liquid**	1.1	447.7	1.2	468.0	5.3	1,956.3	7.6	2,872.0	1.9	776.7	1.2	453.4	1.1	437.6	4.2	1,667.7
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	gas	0.0	0.0	0.0	0.0	1.1	0.041	1.1	0.041	5.2	0.231	25.0	0.968	5.2	0.233	35.4	1.4
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	gas	0.0	0.0	0.0	0.0	1.5	0.056	1.5	0.056	99.5	4.4	0.204	0.008	0.207	0.009	99.9	4.4
Heaters																		
CF-H-31003A	6	gas	744.0	12.3	672.0	10.7	735.4	11.2	2,151.4	34.2	717.6	10.0	744.0	11.3	720.0	10.9	2,181.6	32.2
CF-H-31003B	7	gas	744.0	13.2	672.0	11.5	735.0	12.0	2,151.0	36.7	718.1	11.8	743.8	11.6	720.0	11.2	2,181.8	34.6
CF-H-64004 [Fuel Gas]	8	gas	744.0	4.4	671.9	4.3	735.1	4.7	2,151.0	13.4	656.6	3.1	0.0	0.0	588.9	4.3	1,245.5	7.4
CF-H-64004 [Liquid Fuel]	**8**	**liquid**	0.0	0.0	0.0	0.0	4.1	161.2	4.1	161.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CF-H-64005 [Fuel Gas]	9	gas	744.0	5.3	671.9	4.8	741.4	5.1	2,157.3	15.2	720.0	5.0	744.0	5.9	131.2	1.0	1,595.2	11.9
CF-H-64005 [Liquid Fuel]	**9**	**liquid**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CF-U-68007-H1	10	gas	744.0	6.8	671.3	6.2	723.6	6.6	2,139.0	19.7	719.4	6.4	744.0	6.3	720.0	6.0	2,183.4	18.7
Engines																		
CF-G-70008 (E8)	11	liquid	3.6	362.0	9.9	989.0	4.2	424.4	17.8	1,775.4	1.1	113.1	4.1	408.3	3.5	352.2	8.7	873.6
CF-G-70375	12	liquid	1.3	16.0	1.2	14.0	5.7	68.0	8.2	98.0	0.0	0.0	5.3	63.0	2.8	33.0	8.0	96.0
Incinerators																		
CF-K-59701	13	gas	300.1	0.174	230.5	0.145	287.7	0.182	818.3	0.501	289.2	0.164	319.3	0.172	326.3	0.175	934.8	0.511
		refuse	35.8	tons	30.3	tons	38.5	tons	104.5	tons	35.8	tons	38.5	tons	14.0	tons	88.3	tons
CF-K-59702	14	gas	322.2	0.162	236.1	0.113	335.1	0.168	893.4	0.442	320.9	0.155	330.5	0.163	342.4	0.176	993.8	0.494
		refuse	38.5	tons	27.5	tons	41.0	tons	107.0	tons	39.0	tons	0.0	tons	41.3	tons	80.3	tons
Flares																		
CF-X-35002	15	gas	744.0	0.394	672.0	0.324	742.0	1.3	2,158.0	2.0	720.0	0.740	424.3	0.316	720.0	0.332	1,864.3	1.4
CF-X-35012	16	gas	744.0	15.3	672.0	13.3	742.0	19.1	2,158.0	47.7	720.0	10.2	744.0	10.8	720.0	12.4	2,184.0	33.4
Portable Flares	17	gas							0.0	0.0							0.0	0.0
Well Pad Heaters																		
CD2-H-30001	18	gas	743.4	1.4	672.0	1.4	730.6	1.2	2,146.0	4.0	715.7	1.1	743.8	1.1	115.6	0.169	1,575.1	2.4
CD3-U-303007-H1	19	gas	744.0	2.3	669.9	1.9	731.3	2.1	2,145.2	6.3	715.8	2.0	743.9	2.0	703.1	1.8	2,162.8	5.9
CD4-U-304007-H1	20	gas	744.0	2.1	671.1	2.0	730.9	2.3	2,146.0	6.4	716.1	2.1	732.5	1.8	695.8	1.6	2,144.4	5.4
Well Pad Engines																		
CD3-U-703001-G1	21	liquid	2.3	99.2	3.6	156.1	4.1	179.0	10.0	434.3	1.1	47.7	2.0	86.5	1.1	47.7	4.2	181.9
CD3-U-703201-G1	622	liquid	2.2	127.7	2.5	147.2	4.1	239.6	8.9	514.5	1.2	68.2	0.912	52.8	2.4	137.7	4.5	258.8
Doyon Drilling Rig 19 at CD1/CD2																		
Generator 2	22	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.0	2,022.7	19.0	1,011.4	0.0	0.0	57.0	3,034.1
Generator 5	23	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	851.7	39.0	2,076.0	0.0	0.0	55.0	2,927.7
Generator 1	24	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generator 0 (removed)	25	liquid		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0
Generator 3	26	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generator 4	27	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pits Move Engine		liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0	580.5	13.0	260.2	0.0	0.0	42.0	840.7
Pipe Shed Move Engine and Portable Move Engine		liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	50.3	3.0	16.8	0.0	0.0	12.0	67.1
Camp Generator 1	30	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Camp Generator 2	31	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cement Pump 1	32	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	119.3	3.0	39.8	12.0	159.0
Cement Pump 2	33	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	119.3	3.0	39.8	12.0	159.0
Boiler 1	34	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	1,806.0	347.0	8,952.6	0.0	0.0	417.0	10,758.6
Boiler 2	35	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	117.0	3,018.6	671.0	17,311.8	0.0	0.0	788.0	20,330.4
HEA-AIR-008 (Dicks Heater)	36	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.0	1,531.4	627.0	10,107.0	0.0	0.0	722.0	11,638.3
HEA-AIR-006 (Dicks Heater)	37	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	111.0	2,683.9	31.0	749.6	0.0	0.0	142.0	3,433.5
HEA-AIR-007 (Dicks Heater)	38	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.0	3,095.0	0.0	0.0	0.0	0.0	96.0	3,095.0
MP1	39	liquid	399.0	4,180.6	396.0	4,149.2	437.0	4,578.8	1,232.0	12,908.5	420.0	4,400.6	351.0	3,677.7	294.0	3,080.4	1,065.0	11,158.8
BP1	40	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BP2	41	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Tag Number	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Gas Turbines																		
CF-C-33012-TB (C1)	715.8	185.7	674.5	179.3	674.2	177.1	2,064.5	542.2	744.0	190.8	722.0	187.5	744.0	198.7	2,210.0	577.0	8,608.3	2,305.0
CF-G-70001-TB (E1)	744.0	133.2	672.1	123.7	697.6	127.8	2,113.8	384.6	744.0	132.8	722.0	140.7	744.0	150.8	2,210.0	424.3	8,663.5	1,675.7
CF-G-70002-TB (E2)	23.2	1.3	397.6	23.2	81.6	5.9	502.4	30.4	679.2	47.0	722.0	46.7	701.4	45.4	2,102.6	139.1	6,652.8	428.7
~~CF-G-70002-TB~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CF-G-70300-TB [Rich Fuel Gas (S1)]	362.5	16.0	38.1	1.6	0.0	0.0	400.6	17.6	1.4	0.063	0.006	0.0	1.2	0.055	2.7	0.118	594.6	26.2
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	0.134	0.006	2.3	0.094	0.0	0.0	2.4	0.100	0.470	0.020	3.1	0.127	1.3	0.057	4.8	0.204	168.8	7.6
CF-G-70300-TB [Liquid Fuel (S1)]	0.0	0.0	9.6	3,334.3	4.5	1,765.1	14.1	5,099.4	1.0	411.3	2.6	1,054.0	1.2	536.1	4.7	2,001.4	30.6	11,640.5
CF-G-70350-TB [Lean Fuel Gas (S2)]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CF-G-70350-TB [Rich Fuel Gas (S2)]	326.0	14.4	92.1	3.7	583.4	24.6	1,001.6	42.6	215.1	8.0	1.3	0.052	19.1	0.765	235.5	8.8	1,273.6	52.9
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	0.413	0.018	1.2	0.046	0.217	0.009	1.8	0.073	0.905	0.034	0.226	0.009	25.5	1.0	26.7	1.1	129.9	5.6
Heaters																		
CF-H-31003A	716.4	10.4	680.9	11.8	449.8	6.6	1,847.1	28.8	621.9	8.2	721.7	9.7	743.0	9.7	2,086.6	27.5	8,266.6	122.7
CF-H-31003B	711.3	10.5	419.3	5.3	693.8	10.9	1,824.3	26.6	744.0	9.5	721.7	9.1	744.0	9.5	2,209.7	28.1	8,366.9	126.0
CF-H-64004 [Fuel Gas]	744.0	5.1	278.3	2.7	667.3	2.4	1,689.6	10.1	743.9	3.9	721.0	4.6	743.9	4.7	2,208.8	13.3	7,294.9	44.2
CF-H-64004 [Liquid Fuel]	0.0	0.0	1.9	98.8	0.0	0.0	1.9	98.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	260.0
CF-H-64005 [Fuel Gas]	0.0	0.0	458.2	4.6	719.6	5.1	1,177.8	9.6	743.4	3.3	714.8	3.1	743.1	4.2	2,201.3	10.6	7,131.7	47.4
CF-H-64005 [Liquid Fuel]	0.0	0.0	0.167	15.4	0.0	0.0	0.167	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.167	15.4
CF-U-68007-H1	719.7	5.8	668.9	5.1	693.2	4.9	2,081.8	15.8	744.0	5.8	722.0	5.5	744.0	5.9	2,210.0	17.2	8,614.2	71.4
Engines																		
CF-G-70008 (E8)	9.0	898.2	6.9	695.0	1.5	150.9	17.4	1,744.1	2.1	214.0	0.0	0.0	4.4	440.0	6.5	654.0	50.5	5,047.1
CF-G-70375	1.2	14.0	2.9	35.0	0.0	0.0	4.1	49.0	1.5	18.0	2.8	33.0	5.5	66.0	9.8	117.0	30.0	360.0
Incinerators																		
CF-K-59701 (gas)	363.6	0.193	345.8	0.181	342.7	0.186	1,052.2	0.560	359.9	0.207	331.6	0.197	346.7	0.219	1,038.1	0.623	3,843.4	2.2
CF-K-59701 (refuse)	44.0	tons	41.3	tons	16.0	tons	101.3	tons	44.0	tons	41.3	tons	44.0	tons	129.3	tons	423.3	tons
CF-K-59702 (gas)	354.6	0.168	343.2	0.176	365.4	0.187	1,063.2	0.531	357.5	0.180	343.2	0.183	366.0	0.190	1,066.7	0.553	4,017.2	2.0
CF-K-59702 (refuse)	41.3	tons	41.3	tons	46.8	tons	129.3	tons	41.3	tons	41.3	tons	44.0	tons	126.5	tons	443.1	tons
Flares																		
CF-X-35002	744.0	1.1	739.2	1.4	720.0	0.555	2,203.2	3.0	744.0	0.343	722.0	0.337	744.0	0.342	2,210.0	1.0	8,435.5	7.4
CF-X-35012	744.0	21.8	703.8	8.2	695.5	10.9	2,143.3	40.9	744.0	0.365	722.0	0.359	744.0	0.371	2,210.0	1.1	8,695.3	123.0
Portable Flares							0.0	0.0							0.0	0.0	0.0	0.0
Well Pad Heaters																		
CD2-H-30001	0.0	0.0	438.0	0.741	667.3	1.3	1,105.3	2.1	744.0	1.8	721.1	1.5	743.0	1.8	2,208.1	5.1	7,034.5	13.5
CD3-U-303007-H1	637.4	1.6	667.5	1.8	674.8	1.9	1,979.8	5.3	743.4	2.2	722.0	2.0	744.0	2.4	2,209.5	6.6	8,497.3	24.1
CD4-U-304007-H1	697.8	1.5	669.3	1.5	664.5	1.5	2,031.5	4.4	743.7	1.7	722.0	1.6	744.0	1.9	2,209.7	5.2	8,531.6	21.4
Well Pad Engines																		
CD3-U-703001-G1	1.1	47.5	12.2	530.1	0.0	0.0	13.3	577.7	2.2	97.0	1.1	48.0	0.0	0.0	3.3	144.9	30.8	1,338.8
CD3-U-703201-G1	1.1	63.6	10.6	611.2	0.0	0.0	11.7	674.8	2.2	127.6	1.1	63.7	0.0	0.0	3.3	191.3	28.3	1,639.4
Doyon Drilling Rig 19 at CD1/CD2																		
Generator 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.0	3,034.1
Generator 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0	2,927.7
Generator 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generator 0 (removed)		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Generator 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generator 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pits Move Engine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.0	840.7
Pipe Shed Move Engine and Portable Move Engine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	67.1
Camp Generator 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Camp Generator 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cement Pump 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	159.0
Cement Pump 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	159.0
Boiler 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	417.0	10,758.6
Boiler 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	788.0	20,330.4
HEA-AIR-008 (Dicks Heater)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	722.0	11,638.3
HEA-AIR-006 (Dicks Heater)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	142.0	3,433.5
HEA-AIR-007 (Dicks Heater)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.0	3,095.0
MP1	205.0	2,147.9	238.0	2,493.7	254.0	2,661.3	697.0	7,303.0	319.0	3,342.4	363.0	3,803.4	404.0	4,233.0	1,086.0	11,378.8	4,080.0	42,749.1
BP1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BP2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Fuel Consumption and Hours of Operation
2014

Tag Number (Year: 2014)	Unit ID	Fuel Type	January hrs	January fuel MMscf Gallons	February hrs	February fuel MMscf Gallons	March hrs	March fuel MMscf Gallons	1Q Total hrs	1Q Total fuel MMscf Gallons	April hrs	April fuel MMscf Gallons	May hrs	May fuel MMscf Gallons	June hrs	June fuel MMscf Gallons	2Q Total hrs	2Q Total fuel MMscf Gallons
Doyon Drilling Rig 19 at CD3																		
Generator 2	22	liquid	0.0	0.0	0.0	0.0	6.0	319.4	6.0	319.4	11.0	585.5	0.0	0.0	0.0	0.0	11.0	585.5
Generator 5	23	liquid	16.0	851.7	0.0	0.0	20.0	1,064.6	36.0	1,916.3	42.0	2,235.7	0.0	0.0	0.0	0.0	42.0	2,235.7
Generator 1	24	liquid	0.0	0.0	0.0	0.0	6.0	319.4	6.0	319.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generator 0 (removed)	25	liquid		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0
Generator 3	26	liquid	52.0	2,768.0	0.0	0.0	20.0	1,064.6	72.0	3,832.6	2.0	106.5	0.0	0.0	0.0	0.0	2.0	106.5
Generator 4	27	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pits Move Engine		liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	140.1	0.0	0.0	0.0	0.0	7.0	140.1
Pipe Shed Move Engine and Portable Move Engine		liquid	8.0	44.7	0.0	0.0	72.0	402.5	80.0	447.2	2.0	11.2	0.0	0.0	0.0	0.0	2.0	11.2
Camp Generator 1	30	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Camp Generator 2	31	liquid	116.0	3,306.0	0.0	0.0	5.0	142.5	121.0	3,448.5	72.0	2,052.0	0.0	0.0	0.0	0.0	72.0	2,052.0
Cement Pump 1	32	liquid	2.0	26.5	16.0	212.0	11.0	145.8	29.0	384.3	3.0	39.8	0.0	0.0	0.0	0.0	3.0	39.8
Cement Pump 2	33	liquid	2.0	26.5	16.0	212.0	11.0	145.8	29.0	384.3	3.0	39.8	0.0	0.0	0.0	0.0	3.0	39.8
Boiler 1	34	liquid	223.0	5,753.4	656.0	16,924.8	727.0	18,756.6	1,606.0	41,434.8	509.0	13,132.2	0.0	0.0	0.0	0.0	509.0	13,132.2
Boiler 2	35	liquid	239.0	6,166.2	671.0	17,311.8	735.0	18,963.0	1,645.0	42,441.0	563.0	14,525.4	0.0	0.0	0.0	0.0	563.0	14,525.4
HEA-AIR-008 (Dicks Heater)	36	liquid	210.0	3,385.1	669.0	10,784.0	725.0	11,686.7	1,604.0	25,855.8	556.0	8,962.5	0.0	0.0	0.0	0.0	556.0	8,962.5
HEA-AIR-006 (Dicks Heater)	37	liquid	202.0	4,884.2	647.0	15,644.0	677.0	16,369.4	1,526.0	36,897.7	517.0	12,500.7	0.0	0.0	0.0	0.0	517.0	12,500.7
HEA-AIR-007 (Dicks Heater)	38	liquid	254.0	8,188.7	672.0	21,664.7	742.0	23,921.4	1,668.0	53,774.9	402.0	12,960.1	0.0	0.0	0.0	0.0	402.0	12,960.1
Doyon Drilling Rig 19 at CD4																		
Generator 2	22	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.0	2,235.7	20.0	1,064.6	62.0	3,300.3
Generator 5	23	liquid	41.0	2,182.4	0.0	0.0	0.0	0.0	41.0	2,182.4	0.0	0.0	24.0	1,277.5	20.0	1,064.6	44.0	2,342.1
Generator 1	24	liquid	1.0	53.2	0.0	0.0	0.0	0.0	1.0	53.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generator 0 (removed)	25	liquid		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0
Generator 3	26	liquid	25.0	1,330.8	0.0	0.0	0.0	0.0	25.0	1,330.8	0.0	0.0	2.0	106.5	0.0	0.0	2.0	106.5
Generator 4	27	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pits Move Engine		liquid	20.0	400.3	0.0	0.0	0.0	0.0	20.0	400.3	0.0	0.0	28.0	560.5	0.0	0.0	28.0	560.5
Pipe Shed Move Engine and Portable Move Engine		liquid	60.0	335.4	0.0	0.0	0.0	0.0	60.0	335.4	0.0	0.0	1.0	5.6	10.0	55.9	11.0	61.5
Camp Generator 1	30	liquid	2.0	57.0	0.0	0.0	0.0	0.0	2.0	57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Camp Generator 2	31	liquid	12.0	342.0	0.0	0.0	0.0	0.0	12.0	342.0	23.0	655.5	0.0	0.0	0.0	0.0	23.0	655.5
Cement Pump 1	32	liquid	9.0	119.3	0.0	0.0	0.0	0.0	9.0	119.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cement Pump 2	33	liquid	9.0	119.3	0.0	0.0	0.0	0.0	9.0	119.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boiler 1	34	liquid	471.0	12,151.8	0.0	0.0	0.0	0.0	471.0	12,151.8	0.0	0.0	5.0	129.0	283.0	7,301.4	288.0	7,430.4
Boiler 2	35	liquid	471.0	12,151.8	0.0	0.0	0.0	0.0	471.0	12,151.8	0.0	0.0	24.0	619.2	432.0	11,145.6	456.0	11,764.8
HEA-AIR-008 (Dicks Heater)	36	liquid	465.0	7,495.6	0.0	0.0	0.0	0.0	465.0	7,495.6	0.0	0.0	0.0	0.0	189.0	3,046.6	189.0	3,046.6
HEA-AIR-006 (Dicks Heater)	37	liquid	504.0	12,186.4	0.0	0.0	0.0	0.0	504.0	12,186.4	0.0	0.0	24.0	580.3	279.0	6,746.0	303.0	7,326.3
HEA-AIR-007 (Dicks Heater)	38	liquid	490.0	15,797.2	0.0	0.0	0.0	0.0	490.0	15,797.2	0.0	0.0	0.0	0.0	41.0	1,321.8	41.0	1,321.8
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																		
Ball Mill Engine		liquid	45.3	754.2	0.0	0.0	26.6	442.9	71.9	1,197.1	65.5	1,090.6	64.0	1,065.6	20.6	343.0	150.1	2,499.2
Well Service Heater	42	liquid		1,148.8		3,312.4		1,469.7		5,930.9		1,604.6		972.7		891.7		3,469.0
Well Service Engines	42	liquid		2,539.8		3,617.3		3,008.7		9,165.8		2,828.4		2,711.8		2,408.3		7,948.5
Well Frac Unit Engine	43	liquid		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Fuel Gas H_2S Concentration				40.0 ppmv		40.0 ppmv		40.0 ppmv		40.0 ppmv		40.0 ppmv		40.0 ppmv		**31.6 ppmv**		37.2 ppmv
Alpine ULSD Diesel Sulfur Content				3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw
ULSD Sulfur Content used for Emissions Calculations→→→				3.0 ppmw		3.0 ppmw		3.0 ppmw				3.0 ppmw		3.0 ppmw		3.0 ppmw		
Crude Oil Production (bbl)				1,738,372 bbl		1,545,935 bbl		1,662,030 bbl		4,946,337 bbl		1,615,707 bbl		1,685,869 bbl		1,573,787 bbl		4,875,363 bbl
CD1, CD2, CD3, & CD4 combined Temporary Crude Oil Storage Tank Monthly VOC emissions (tons) [Well Maintenance ONLY]				0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons

Tag Number (Year: 2014)	Unit ID	Fuel Type	July hrs	July fuel MMscf Gallons	August hrs	August fuel MMscf Gallons	September hrs	September fuel MMscf Gallons	3Q Total hrs	3Q Total fuel MMscf Gallons	October hrs	October fuel MMscf Gallons	November hrs	November fuel MMscf Gallons	December hrs	December fuel MMscf Gallons	4Q Total hrs	4Q Total fuel MMscf Gallons	Annual Total hrs	Annual Total fuel MMscf Gallons
Doyon Drilling Rig 19 at CD3																				
Generator 2	22	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.0	904.9
Generator 5	23	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.0	4,151.9
Generator 1	24	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	319.4
Generator 0 (removed)	25	liquid		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Generator 3	26	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	74.0	3,939.0
Generator 4	27	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pits Move Engine		liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	140.1
Pipe Shed Move Engine and Portable Move Engine		liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.0	458.4
Camp Generator 1	30	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Camp Generator 2	31	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	193.0	5,500.5
Cement Pump 1	32	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.0	424.0
Cement Pump 2	33	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.0	424.0
Boiler 1	34	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,115.0	54,567.0
Boiler 2	35	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,208.0	56,966.4
HEA-AIR-008 (Dicks Heater)	36	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,160.0	34,818.3
HEA-AIR-006 (Dicks Heater)	37	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,043.0	49,398.4
HEA-AIR-007 (Dicks Heater)	38	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,070.0	66,735.0
Doyon Drilling Rig 19 at CD4																				
Generator 2	22	liquid	0.0	0.0	2.0	106.5	0.0	0.0	2.0	106.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.0	3,406.7
Generator 5	23	liquid	0.0	0.0	29.0	1,543.7	10.0	532.3	39.0	2,076.0	0.0	0.0	21.0	1,117.8	14.0	745.2	35.0	1,863.1	159.0	8,463.6
Generator 1	24	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	53.2
Generator 0 (removed)	25	liquid		0.0		0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Generator 3	26	liquid	0.0	0.0	90.0	4,790.7	41.0	2,182.4	131.0	6,973.1	0.0	0.0	21.0	1,117.8	0.0	0.0	21.0	1,117.8	179.0	9,528.2
Generator 4	27	liquid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	745.2	14.0	745.2	14.0	745.2
Pits Move Engine		liquid	0.0	0.0	2.0	40.0	0.0	0.0	2.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	1,000.8
Pipe Shed Move Engine and Portable Move Engine		liquid	0.0	0.0	19.0	106.2	10.0	55.9	29.0	162.1	0.0	0.0	4.0	22.4	12.0	67.1	16.0	89.4	116.0	648.4
Camp Generator 1	30	liquid	0.0	0.0	0.0	0.0	10.0	285.0	10.0	285.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	342.0
Camp Generator 2	31	liquid	0.0	0.0	74.0	2,109.0	44.0	1,254.0	118.0	3,363.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	153.0	4,360.5
Cement Pump 1	32	liquid	2.0	26.5	1.0	13.3	9.0	119.3	12.0	159.0	0.0	0.0	1.0	13.3	20.0	265.0	21.0	278.3	42.0	556.5
Cement Pump 2	33	liquid	2.0	26.5	1.0	13.3	9.0	119.3	12.0	159.0	0.0	0.0	1.0	13.3	20.0	265.0	21.0	278.3	42.0	556.5
Boiler 1	34	liquid	559.0	14,422.2	581.0	14,989.8	455.0	11,739.0	1,595.0	41,151.0	610.0	15,738.0	661.0	17,053.8	721.0	18,601.8	1,992.0	51,393.6	4,346.0	112,126.8
Boiler 2	35	liquid	0.0	0.0	0.0	0.0	489.0	12,616.2	489.0	12,616.2	743.0	19,169.4	709.0	18,292.2	730.0	18,834.0	2,182.0	56,295.6	3,598.0	92,828.4
HEA-AIR-008 (Dicks Heater)	36	liquid	153.0	2,466.3	302.0	4,868.1	600.0	9,671.7	1,055.0	17,006.1	742.0	11,960.7	694.0	11,187.0	720.0	11,606.1	2,156.0	34,753.8	3,865.0	62,302.1
HEA-AIR-006 (Dicks Heater)	37	liquid	5.0	120.9	1.0	24.2	386.0	9,333.2	392.0	9,478.3	626.0	15,136.3	609.0	14,725.2	640.0	15,474.8	1,875.0	45,336.3	3,074.0	74,327.3
HEA-AIR-007 (Dicks Heater)	38	liquid	0.0	0.0	17.0	548.1	27.0	870.5	44.0	1,418.5	28.0	902.7	510.0	16,442.0	724.0	23,341.1	1,262.0	40,685.8	1,837.0	59,223.3
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																				
Ball Mill Engine		liquid	0.0	0.0	156.9	2,612.4	79.0	1,315.4	235.9	3,927.7	0.0	0.0	9.5	158.2	30.4	506.2	39.9	664.3	497.8	8,288.4
Well Service Heater	42	liquid		1,046.8		968.4		2,196.5		4,211.7		1,047.6		1,106.4		2,540.8		4,694.9		18,306.4
Well Service Engines	42	liquid		2,453.2		2,286.6		3,308.2		8,048.0		2,706.8		2,143.6		3,176.2		8,026.6		33,188.9
Well Frac Unit Engine	43	liquid		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Fuel Gas H_2S Concentration				31.6 ppmv		31.6 ppmv		31.6 ppmv		31.6 ppmv		31.6 ppmv		31.6 ppmv		**30.0 ppmv**		31.1 ppmv		35.0 ppmv
Alpine ULSD Diesel Sulfur Content				3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw		3.0 ppmw
ULSD Sulfur Content used for Emissions Calculations→→→				3.0 ppmw		3.0 ppmw		3.0 ppmw				3.0 ppmw		3.0 ppmw		3.0 ppmw				3.0 ppmw
Crude Oil Production (bbl)				1,523,807 bbl		1,397,633 bbl		1,425,027 bbl		4,346,467 bbl		1,516,381 bbl		1,469,166 bbl		1,495,570 bbl		4,481,117 bbl		18,649,284 bbl
CD1, CD2, CD3, & CD4 combined Temporary Crude Oil Storage Tank Monthly VOC emissions (tons) [Well Maintenance ONLY]				0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons		0.0 tons

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	Actual MMBtu/hr																
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Gas Turbines																					
CF-C-33012-TB (C1)	1	N-P MS5382	38,000 hp	gas	348.61	343.83	348.19	346.97	339.27	346.83	339.82	342.02	326.66	334.66	330.79	330.62	322.88	326.94	336.25	328.70	337.11
CF-G-70001-TB (E1)	2	N-P PG5371	26,410 kW	gas	253.71	252.31	263.23	256.54	260.62	243.23	235.54	246.43	225.39	231.66	230.55	229.09	224.73	245.36	255.17	241.72	243.51
CF-G-70002-TB (E2)	3	N-P PGT10+	11,270 kW	gas	80.98	81.43	79.42	80.59	80.34	80.85	80.64	80.63	72.77	73.33	91.16	76.20	87.14	81.48	81.50	83.32	81.13
~~CF-G-70002-TB~~	~~3~~	~~N-P PGT10+~~	~~11,270 kW~~	~~liquid~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~	~~0.00~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	58.27	57.57	50.79	55.49	56.34	48.53	55.62	55.59	55.61	51.97	0.00	55.26	54.52	51.86	56.40	55.37	55.37
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	58.27	57.57	50.79	56.89	56.34	48.53	55.62	51.53	55.61	51.97	0.00	52.17	54.52	51.86	56.40	53.31	56.68
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**Solar Taurus 60S (Dual-Fired)**	**5.5 MW**	**liquid**	51.27	49.77	45.51	46.99	50.28	48.22	50.12	49.66	0.00	43.17	48.67	44.92	51.03	50.62	57.02	52.28	47.22
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.00	0.00	47.27	47.27	55.60	48.82	56.25	50.92	55.59	50.10	53.04	53.60	46.83	51.20	50.55	47.15	52.33
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.00	0.00	47.27	47.27	55.60	48.82	56.25	55.59	55.59	50.10	53.04	51.72	46.83	51.20	50.55	50.43	54.38
Heaters																					
CF-H-31003A	6	Born Crude Heater	65.60 MMBtu/hr	gas	20.74	20.11	19.20	20.02	17.60	19.07	19.03	18.58	18.23	21.89	18.38	19.62	16.53	16.89	16.40	16.61	18.69
CF-H-31003B	7	Born Crude Heater	65.60 MMBtu/hr	gas	22.40	21.55	20.54	21.50	20.62	19.68	19.53	19.94	18.51	15.80	19.81	18.38	16.08	15.89	16.02	16.00	18.96
CF-H-64004 [Fuel Gas]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	7.52	8.01	7.99	7.83	5.95	0.00	9.22	7.50	8.55	12.02	4.49	7.52	6.66	8.04	8.02	7.57	7.62
CF-H-64004 [Liquid Fuel]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.00	0.00	4.90	4.90	0.00	0.00	0.00	0.00	0.00	6.39	0.00	6.39	0.00	0.00	0.00	0.00	5.38
CF-H-64005 [Fuel Gas]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	8.98	8.99	8.69	8.88	8.74	9.95	9.75	9.39	0.00	12.52	8.91	10.31	5.66	5.47	7.03	6.06	8.36
CF-H-64005 [Liquid Fuel]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.48	0.00	11.48	0.00	0.00	0.00	0.00	11.48
CF-U-68007-H1	10	Hot Oil Heater	36.75 MMBtu/hr	gas	11.59	11.65	11.54	11.59	11.15	10.71	10.51	10.79	10.10	9.67	8.85	9.54	9.78	9.67	9.92	9.79	10.43
Engines																					
CF-G-70008 (E8)	11	Cummins KTTA50-G2-V16	1,500 kW	liquid	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	13.15	0.00	13.15	13.15	13.15
CF-G-70375	12	Detroit Diesel 12V2000-R1237k35	600 kW	liquid	1.58	1.58	1.58	1.58	0.00	1.58	1.58	1.58	1.58	1.58	0.00	1.58	1.58	1.58	1.58	1.58	1.58
Incinerators																					
CF-K-59701	13	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse	0.73	0.79	0.80	0.77	0.71	0.68	0.67	0.69	0.67	0.66	0.68	0.67	0.73	0.75	0.79	0.76	0.72
CF-K-59702	14	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse	0.63	0.60	0.63	0.62	0.61	0.62	0.65	0.63	0.60	0.65	0.64	0.63	0.63	0.67	0.65	0.65	0.63
Flares																					
CF-X-35002	15	HP Flare	261 MMscfd	gas	0.73	0.67	2.38	1.28	1.42	1.03	0.64	1.03	1.99	2.59	1.07	1.89	0.64	0.65	0.64	0.64	1.22
CF-X-35012	16	LP Flare	212 MMscfd	gas	28.52	27.30	35.63	30.59	19.65	20.05	23.85	21.17	40.49	16.08	21.74	26.39	0.68	0.69	0.69	0.69	19.59
Portable Flares	17	Portable Flares	3.9 MMscfd	gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Pad Heaters																					
CD2-H-30001	18	OPS Production Heater	20.0 MMBtu/hr	gas	2.37	2.57	2.07	2.33	1.89	1.89	1.84	1.89	0.00	2.13	2.53	2.37	3.10	2.61	3.02	2.9	2.42
CD3-U-303007-H1	19	GTS Energy Production Heater	20.0 MMBtu/hr	gas	3.88	3.63	3.59	3.70	3.56	3.40	3.29	3.42	3.12	3.38	3.63	3.38	3.76	3.40	4.04	3.74	3.56
CD4-U-304007-H1	20	GTS Energy Production Heater	20.0 MMBtu/hr	gas	3.53	3.72	3.93	3.73	3.62	3.10	2.85	3.19	2.63	2.74	2.80	2.72	2.95	2.74	3.20	2.97	3.16
Well Pad Engines																					
CD3-U-703001-G1	21	CD3 Standby Generator - CAT 3412E	600 kW	liquid	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	5.71	0.00	5.71	5.71	5.71	0.00	5.71	5.71
CD3-U-703201-G1	622	CD3 Standby Generator - CAT C27	800 kW	liquid	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	7.62	0.00	7.62	7.62	7.62	0.00	7.62	7.62
Doyon Drilling Rig 19 at CD1/CD2																					
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	0.00	7.00	7.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	0.00	7.00	7.00	0.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.00	0.00	0.00	0.00	2.63	2.63	0.00	2.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.63
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.00	0.00	0.00	0.00	0.74	0.74	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.00	0.00	0.00	0.00	0.00	1.74	1.74	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.00	0.00	0.00	0.00	0.00	1.74	1.74	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74
Boiler 1	34	Superior Boiler	100 hp	liquid	0.00	0.00	0.00	0.00	3.20	3.20	0.00	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39
Boiler 2	35	Superior Boiler	100 hp	liquid	0.00	0.00	0.00	0.00	3.20	3.20	0.00	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.00	0.00	0.00	0.00	2.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.12
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.00	0.00	0.00	0.00	3.00	3.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.00	0.00	0.00	0.00	4.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24
MP1	39	Mud Plant Boiler	1.30 MMBtu/hr	liquid	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.38
BP1	40	Detroit 6063-GK35 Power	300 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BP2	41	Detroit 6043-GK35 Power	160 kW	liquid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	Actual MMBtu/hr																
					Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Avg.
Doyon Drilling Rig 19 at CD3																					
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	7.00	**7.00**	7.00	0.00	0.00	**7.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.00**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid	7.00	0.00	7.00	**7.00**	7.00	0.00	0.00	**7.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.00**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	7.00	**7.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.00**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid	7.00	0.00	7.00	**7.00**	7.00	0.00	0.00	**7.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.00**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.00	0.00	0.00	**0.00**	2.63	0.00	0.00	**2.63**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**2.63**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.74	0.00	0.74	**0.74**	0.74	0.00	0.00	**0.74**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.74**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	3.75	0.00	3.75	**3.75**	3.75	0.00	0.00	**3.75**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**3.75**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	1.74	1.74	1.74	**1.74**	1.74	0.00	0.00	**1.74**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**1.74**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	1.74	1.74	1.74	**1.74**	1.74	0.00	0.00	**1.74**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**1.74**
Boiler 1	34	Superior Boiler	100 hp	liquid	3.20	3.20	3.20	**3.20**	3.20	0.00	0.00	**3.20**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**3.39**
Boiler 2	35	Superior Boiler	100 hp	liquid	3.20	3.20	3.20	**3.20**	3.20	0.00	0.00	**3.20**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**3.39**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	2.00	2.00	2.00	**2.00**	2.00	0.00	0.00	**2.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**2.12**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	3.00	3.00	3.00	**3.00**	3.00	0.00	0.00	**3.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**3.18**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	4.00	4.00	4.00	**4.00**	4.00	0.00	0.00	**4.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**4.24**
Doyon Drilling Rig 19 at CD4																					
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	**0.00**	0.00	7.00	7.00	**7.00**	0.00	7.00	0.00	**7.00**	0.00	0.00	0.00	**0.00**	**7.00**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid	7.00	0.00	0.00	**7.00**	0.00	7.00	7.00	**7.00**	0.00	7.00	7.00	**7.00**	0.00	7.00	7.00	**7.00**	**7.00**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid	7.00	0.00	0.00	**7.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**7.00**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid	7.00	0.00	0.00	**7.00**	0.00	7.00	0.00	**7.00**	0.00	7.00	7.00	**7.00**	0.00	7.00	0.00	**7.00**	**7.00**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	7.00	**7.00**	**7.00**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	2.63	0.00	0.00	**2.63**	0.00	2.63	0.00	**2.63**	0.00	2.63	0.00	**2.63**	0.00	0.00	0.00	**0.00**	**2.63**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.74	0.00	0.00	**0.74**	0.00	0.74	0.74	**0.74**	0.00	0.74	0.74	**0.74**	0.00	0.74	0.74	**0.74**	**0.74**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	3.75	0.00	0.00	**3.75**	0.00	0.00	0.00	**0.00**	0.00	0.00	3.75	**3.75**	0.00	0.00	0.00	**0.00**	**3.75**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	3.75	0.00	0.00	**3.75**	3.75	0.00	0.00	**3.75**	0.00	3.75	3.75	**3.75**	0.00	0.00	0.00	**0.00**	**3.75**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	1.74	0.00	0.00	**1.74**	0.00	0.00	0.00	**0.00**	1.74	1.74	1.74	**1.74**	0.00	1.74	1.74	**1.74**	**1.74**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	1.74	0.00	0.00	**1.74**	0.00	0.00	0.00	**0.00**	1.74	1.74	1.74	**1.74**	0.00	1.74	1.74	**1.74**	**1.74**
Boiler 1	34	Superior Boiler	100 hp	liquid	3.20	0.00	0.00	**3.20**	0.00	3.20	3.20	**3.20**	3.20	3.20	3.20	**3.20**	3.20	3.20	3.20	**3.20**	**3.39**
Boiler 2	35	Superior Boiler	100 hp	liquid	3.20	0.00	0.00	**3.20**	0.00	3.20	3.20	**3.20**	0.00	0.00	3.20	**3.20**	3.20	3.20	3.20	**3.20**	**3.39**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	2.00	0.00	0.00	**2.00**	0.00	0.00	2.00	**2.00**	2.00	2.00	2.00	**2.00**	2.00	2.00	2.00	**2.00**	**2.12**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	3.00	0.00	0.00	**3.00**	0.00	3.00	3.00	**3.00**	3.00	3.00	3.00	**3.00**	3.00	3.00	3.00	**3.00**	**3.18**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	4.00	0.00	0.00	**4.00**	0.00	0.00	4.00	**4.00**	0.00	4.00	4.00	**4.00**	4.00	4.00	4.00	**4.00**	**4.24**
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																					
Ball Mill Engine		Cummins LTA-1061 Ball Mill Engine	230 kW	liquid	2.07	0.00	2.07	**2.07**	2.07	2.07	2.07	**2.07**	0.00	2.07	2.07	**2.07**	0.00	2.07	2.07	**2.07**	**2.19**
Well Service Heater	42	Various	10.0 MMBtu/hr	liquid	0.20	0.65	0.26	**0.36**	0.29	0.17	0.16	**0.21**	0.19	0.17	0.40	**0.25**	0.19	0.20	0.45	**0.28**	**0.27**
Well Service Engines	42	Various	Various	liquid	0.45	0.71	0.53	**0.56**	0.52	0.48	0.44	**0.48**	0.43	0.40	0.60	**0.48**	0.48	0.39	0.56	**0.48**	**0.50**
Well Frac Unit Engine	43	Various	Various	liquid	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	NO_x EF	NO_x EF	NO_x Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																							
CF-C-33012-TB (C1)	1	N-P MS5382	38,000 hp	gas	0.328		41.6	35.6	41.0	**118.1**	39.0	45.7	43.6	**128.2**	40.1	40.2	37.6	**117.9**	37.7	36.0	37.7	**111.4**	**475.7**
CF-G-70001-TB (E1)	2	N-P PG5371	26,410 kW	gas	0.360		33.6	29.8	35.5	**98.9**	34.6	33.2	30.8	**98.6**	29.7	27.9	28.9	**86.5**	29.3	32.0	34.0	**95.3**	**379.4**
CF-G-70002-TB (E2)	3	N-P PGT10+	11,270 kW	gas	0.140		4.2	3.8	4.0	**11.9**	3.3	4.3	3.3	**10.8**	0.1	2.0	0.5	**2.7**	4.3	4.1	3.9	**12.3**	**37.7**
~~**CF-G-70002-TB**~~	~~3~~	~~**N-P PGT10+**~~	~~**11,270 kW**~~	~~**liquid**~~	~~0.320~~		~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~**0.000**~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.111		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.203		0.0	0.0	0.0	**0.0**	0.2	0.0	0.9	**1.1**	2.0	0.2	0.0	**2.2**	0.0	0.0	0.0	**0.0**	**3.3**
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.532		0.0	2.2	0.2	**2.4**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	**2.5**
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**Solar Taurus 60S (Dual-Fired)**	**5.5 MW**	**liquid**	0.435		0.012	0.013	0.053	**0.078**	0.021	0.012	0.012	**0.045**	0.000	0.090	0.048	**0.138**	0.011	0.028	0.014	**0.054**	**0.314**
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.111		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.203		0.0	0.0	0.0	**0.0**	0.0	0.1	0.0	**0.2**	1.8	0.5	3.1	**5.4**	1.0	0.0	0.1	**1.1**	**6.8**
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.532		0.0	0.0	0.0	**0.0**	1.5	0.0	0.0	**1.5**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.3	**0.4**	**1.9**
Heaters																							
CF-H-31003A	6	Born Crude Heater	65.60 MMBtu/hr	gas	0.050		0.4	0.4	0.4	**1.2**	0.3	0.4	0.4	**1.1**	0.4	0.4	0.2	**1.0**	0.3	0.3	0.3	**1.0**	**4.2**
CF-H-31003B	7	Born Crude Heater	65.60 MMBtu/hr	gas	0.050		0.5	0.4	0.4	**1.3**	0.4	0.4	0.4	**1.2**	0.4	0.2	0.4	**0.9**	0.3	0.3	0.3	**1.0**	**4.4**
CF-H-64004 [Fuel Gas]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.035		0.1	0.1	0.1	**0.3**	0.1	0.0	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	**1.1**
CF-H-64004 [Liquid Fuel]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.146		0.000	0.000	0.002	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	**0.002**
CF-H-64005 [Fuel Gas]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.035		0.1	0.1	0.1	**0.4**	0.1	0.1	0.0	**0.3**	0.0	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.3**	**1.1**
CF-H-64005 [Liquid Fuel]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.146		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-U-68007-H1	10	Hot Oil Heater	36.75 MMBtu/hr	gas	0.025		0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
Engines																							
CF-G-70008 (E8)	11	Cummins KTTA50-G2-V16	1,500 kW	liquid	4.403		0.105	0.286	0.123	**0.514**	0.033	0.118	0.102	**0.253**	0.260	0.201	0.044	**0.505**	0.062	0.000	0.127	**0.189**	**1.461**
CF-G-70375	12	Detroit Diesel 12V2000-R1237k35	600 kW	liquid	3.200		0.003	0.003	0.014	**0.021**	0.000	0.013	0.007	**0.020**	0.003	0.007	0.000	**0.010**	0.004	0.007	0.014	**0.025**	**0.076**
Incinerators																							
CF-K-59701	13	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.068	0.057	0.073	**0.198**	0.067	0.072	0.033	**0.173**	0.082	0.077	0.037	**0.196**	0.083	0.078	0.084	**0.245**	**0.812**
CF-K-59702	14	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.072	0.051	0.076	**0.198**	0.072	0.010	0.077	**0.159**	0.076	0.077	0.086	**0.240**	0.077	0.077	0.082	**0.237**	**0.833**
Flares																							
CF-X-35002	15	HP Flare	261 MMscfd	gas	0.068		0.0	0.0	0.1	**0.1**	0.0	0.0	0.0	**0.1**	0.1	0.1	0.0	**0.1**	0.0	0.0	0.0	**0.0**	**0.3**
CF-X-35012	16	LP Flare	212 MMscfd	gas	0.068		0.7	0.6	0.9	**2.2**	0.5	0.5	0.6	**1.6**	1.0	0.4	0.5	**1.9**	0.0	0.0	0.0	**0.1**	**5.8**
Portable Flares	17	Portable Flares	3.9 MMscfd	gas	0.068		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Well Pad Heaters																							
CD2-H-30001	18	OPS Production Heater	20.0 MMBtu/hr	gas	0.069		0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.1**	0.0	0.0	0.1	**0.1**	0.1	0.1	0.1	**0.2**	**0.6**
CD3-U-303007-H1	19	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.098		0.2	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.2	0.1	0.2	**0.4**	**1.6**
CD4-U-304007-H1	20	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.098		0.1	0.1	0.2	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	**1.5**
Well Pad Engines																							
CD3-U-703001-G1	21	CD3 Standby Generator - CAT 3412E	600 kW	liquid	3.200		0.021	0.033	0.038	**0.091**	0.010	0.018	0.010	**0.038**	0.010	0.112	0.000	**0.122**	0.020	0.010	0.000	**0.030**	**0.282**
CD3-U-703201-G1	622	CD3 Standby Generator - CAT C27	800 kW	liquid	3.200	7.500	0.008	0.010	0.016	**0.033**	0.004	0.003	0.009	**0.017**	0.004	0.040	0.000	**0.044**	0.008	0.004	0.000	**0.012**	**0.106**
Doyon Drilling Rig 19 at CD1/CD2																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.237	0.119	0.000	**0.356**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.356**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.100	0.243	0.000	**0.343**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.343**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	2.649		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	4.410		0.000	0.000	0.000	**0.000**	0.168	0.075	0.000	**0.244**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.244**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	4.410		0.000	0.000	0.000	**0.000**	0.015	0.005	0.000	**0.019**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.019**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.494		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.494		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	2.131		0.000	0.000	0.000	**0.000**	0.000	0.017	0.006	**0.022**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.022**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	2.131		0.000	0.000	0.000	**0.000**	0.000	0.017	0.006	**0.022**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.022**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.146		0.000	0.000	0.000	**0.000**	0.017	0.086	0.000	**0.103**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.103**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.146		0.000	0.000	0.000	**0.000**	0.029	0.166	0.000	**0.195**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.195**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.146		0.000	0.000	0.000	**0.000**	0.015	0.097	0.000	**0.112**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.112**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.146		0.000	0.000	0.000	**0.000**	0.026	0.007	0.000	**0.033**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.033**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.146		0.000	0.000	0.000	**0.000**	0.030	0.000	0.000	**0.030**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.030**
MP1	39	Mud Plant Boiler	1.30 MMBtu/hr	liquid	0.146		0.040	0.040	0.044	**0.124**	0.042	0.035	0.030	**0.107**	0.021	0.024	0.026	**0.070**	0.032	0.036	0.041	**0.109**	**0.410**
BP1	40	Detroit 6063-GK35 Power	300 kW	liquid	2.003		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
BP2	41	Detroit 6043-GK35 Power	160 kW	liquid	1.647		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	NO_x EF	NO_x EF	NO_x Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Doyon Drilling Rig 19 at CD3																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.037	**0.037**	0.069	0.000	0.000	**0.069**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.106**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		12.480	0.100	0.000	0.125	**0.225**	0.262	0.000	0.000	**0.262**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.487**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.037	**0.037**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.037**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	2.649		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		12.480	0.324	0.000	0.125	**0.449**	0.012	0.000	0.000	**0.012**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.462**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	4.410		0.000	0.000	0.000	**0.000**	0.041	0.000	0.000	**0.041**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.041**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	4.410		0.013	0.000	0.117	**0.130**	0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.133**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.494		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.494		0.542	0.000	0.023	**0.565**	0.336	0.000	0.000	**0.336**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.902**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	2.131		0.004	0.030	0.020	**0.054**	0.006	0.000	0.000	**0.006**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.059**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	2.131		0.004	0.030	0.020	**0.054**	0.006	0.000	0.000	**0.006**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.059**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.146		0.055	0.162	0.180	**0.398**	0.126	0.000	0.000	**0.126**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.524**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.146		0.059	0.166	0.182	**0.407**	0.139	0.000	0.000	**0.139**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.547**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.146		0.032	0.103	0.112	**0.248**	0.086	0.000	0.000	**0.086**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.334**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.146		0.047	0.150	0.157	**0.354**	0.120	0.000	0.000	**0.120**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.474**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.146		0.079	0.208	0.230	**0.516**	0.124	0.000	0.000	**0.124**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.640**
Doyon Drilling Rig 19 at CD4																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.000	0.262	0.125	**0.387**	0.000	0.012	0.000	**0.012**	0.000	0.000	0.000	**0.000**	**0.399**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		12.480	0.256	0.000	0.000	**0.256**	0.000	0.150	0.125	**0.275**	0.000	0.181	0.062	**0.243**	0.000	0.131	0.087	**0.218**	**0.992**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		12.480	0.006	0.000	0.000	**0.006**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.006**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	2.649		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		12.480	0.156	0.000	0.000	**0.156**	0.000	0.012	0.000	**0.012**	0.000	0.562	0.256	**0.817**	0.000	0.131	0.000	**0.131**	**1.117**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		12.480	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.087	**0.087**	**0.087**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	4.410		0.116	0.000	0.000	**0.116**	0.000	0.162	0.000	**0.162**	0.000	0.012	0.000	**0.012**	0.000	0.000	0.000	**0.000**	**0.290**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	4.410		0.097	0.000	0.000	**0.097**	0.000	0.002	0.016	**0.018**	0.000	0.031	0.016	**0.047**	0.000	0.006	0.019	**0.026**	**0.188**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.494		0.009	0.000	0.000	**0.009**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.047	**0.047**	0.000	0.000	0.000	**0.000**	**0.056**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.494		0.056	0.000	0.000	**0.056**	0.107	0.000	0.000	**0.107**	0.000	0.346	0.206	**0.551**	0.000	0.000	0.000	**0.000**	**0.715**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	2.131		0.017	0.000	0.000	**0.017**	0.000	0.000	0.000	**0.000**	0.004	0.002	0.017	**0.022**	0.000	0.002	0.037	**0.039**	**0.078**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	2.131		0.017	0.000	0.000	**0.017**	0.000	0.000	0.000	**0.000**	0.004	0.002	0.017	**0.022**	0.000	0.002	0.037	**0.039**	**0.078**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.146		0.117	0.000	0.000	**0.117**	0.000	0.001	0.070	**0.071**	0.138	0.144	0.113	**0.395**	0.151	0.164	0.178	**0.493**	**1.076**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.146		0.117	0.000	0.000	**0.117**	0.000	0.006	0.107	**0.113**	0.000	0.000	0.121	**0.121**	0.184	0.176	0.181	**0.540**	**0.891**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.146		0.072	0.000	0.000	**0.072**	0.000	0.000	0.029	**0.029**	0.024	0.047	0.093	**0.163**	0.115	0.107	0.111	**0.333**	**0.598**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.146		0.117	0.000	0.000	**0.117**	0.000	0.006	0.065	**0.070**	0.001	0.000	0.090	**0.091**	0.145	0.141	0.148	**0.435**	**0.713**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.146		0.152	0.000	0.000	**0.152**	0.000	0.000	0.013	**0.013**	0.001	0.005	0.008	**0.014**	0.009	0.158	0.224	**0.390**	**0.568**
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																							
Ball Mill Engine		Cummins LTA-1061 Ball Mill Engine	230 kW	liquid	4.410		0.206	0.000	0.121	**0.328**	0.298	0.292	0.094	**0.684**	0.000	0.715	0.360	**1.075**	0.000	0.043	0.138	**0.182**	**2.268**
Well Service Heater	42	Various	10.0 MMBtu/hr	liquid	0.146		0.011	0.032	0.014	**0.057**	0.015	0.009	0.009	**0.033**	0.010	0.009	0.021	**0.040**	0.010	0.011	0.024	**0.045**	**0.176**
Well Service Engines	42	Various	Various	liquid	3.302		0.551	0.785	0.653	**1.990**	0.614	0.589	0.523	**1.725**	0.532	0.496	0.718	**1.747**	0.588	0.465	0.689	**1.742**	**7.204**
Well Frac Unit Engine	43	Various	Various	liquid	1.963		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	85.4	75.5	85.9	**246.8**	83.7	87.8	81.8	**253.3**	77.2	75.6	74.3	**227.1**	75.1	75.2	79.8	**230.1**	**957.2**
w/o NREs	82.9	74.7	84.6	**242.2**	81.5	85.9	80.9	**248.2**	76.6	73.2	72.6	**222.5**	74.5	74.4	78.7	**227.6**	**940.5**
w/o D19	82.8	74.7	84.5	**242.0**	81.7	86.4	81.3	**249.3**	77.0	74.3	73.3	**224.5**	74.5	74.2	78.7	**227.3**	**943.1**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	CO EF	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																							
CF-C-33012-TB (C1)	1	N-P MS5382	38,000 hp	gas	0.047		5.0	6.0	5.4	**16.4**	6.3	3.7	3.3	**13.4**	4.7	3.1	6.0	**13.7**	8.7	8.6	7.8	**25.2**	**68.7**
CF-G-70001-TB (E1)	2	N-P PG5371	26,410 kW	gas	0.024		1.7	1.5	1.7	**4.9**	1.9	2.4	2.4	**6.7**	2.6	2.4	2.4	**7.3**	2.3	1.9	1.7	**6.0**	**24.9**
CF-G-70002-TB (E2)	3	N-P PGT10+	11,270 kW	gas	0.051		1.8	1.7	1.9	**5.4**	1.2	1.1	0.7	**3.1**	0.0	0.8	0.1	**1.0**	1.0	1.6	1.8	**4.4**	**13.8**
~~**CF-G-70002-TB**~~	~~3~~	~~**N-P PGT10+**~~	~~**11,270 kW**~~	~~**liquid**~~	~~0.073~~		~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~**0.000**~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.123		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.128		0.0	0.0	0.0	**0.0**	0.1	0.0	0.5	**0.7**	1.3	0.1	0.0	**1.4**	0.0	0.0	0.0	**0.0**	**2.1**
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.368		0.0	1.5	0.2	**1.7**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**1.8**
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**Solar Taurus 60S (Dual-Fired)**	**5.5 MW**	**liquid**	0.131		0.004	0.004	0.016	**0.023**	0.006	0.004	0.004	**0.014**	0.000	0.027	0.014	**0.041**	0.003	0.009	0.004	**0.016**	**0.095**
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.123		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.128		0.0	0.0	0.0	**0.0**	0.0	0.1	0.0	**0.1**	1.2	0.3	2.0	**3.4**	0.6	0.0	0.1	**0.7**	**4.3**
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.368		0.0	0.0	0.0	**0.0**	1.0	0.0	0.0	**1.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.2	**0.2**	**1.3**
Heaters																							
CF-H-31003A	6	Born Crude Heater	65.60 MMBtu/hr	gas	0.018		0.2	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	**1.5**
CF-H-31003B	7	Born Crude Heater	65.60 MMBtu/hr	gas	0.018		0.2	0.1	0.1	**0.5**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.6**
CF-H-64004 [Fuel Gas]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.060		0.2	0.2	0.2	**0.6**	0.1	0.0	0.2	**0.3**	0.2	0.1	0.1	**0.4**	0.2	0.2	0.2	**0.6**	**1.8**
CF-H-64004 [Liquid Fuel]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.036		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
CF-H-64005 [Fuel Gas]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.060		0.2	0.2	0.2	**0.6**	0.2	0.2	0.0	**0.5**	0.0	0.2	0.2	**0.4**	0.1	0.1	0.2	**0.4**	**2.0**
CF-H-64005 [Liquid Fuel]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.036		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-U-68007-H1	10	Hot Oil Heater	36.75 MMBtu/hr	gas	0.066		0.3	0.3	0.3	**0.9**	0.3	0.3	0.3	**0.9**	0.3	0.2	0.2	**0.7**	0.3	0.3	0.3	**0.8**	**3.3**
Engines																							
CF-G-70008 (E8)	11	Cummins KTTA50-G2-V16	1,500 kW	liquid	0.923		0.022	0.060	0.026	**0.108**	0.007	0.025	0.021	**0.053**	0.055	0.042	0.009	**0.106**	0.013	0.000	0.027	**0.040**	**0.306**
CF-G-70375	12	Detroit Diesel 12V2000-R1237k35	600 kW	liquid	0.850		0.001	0.001	0.004	**0.005**	0.000	0.004	0.002	**0.005**	0.001	0.002	0.000	**0.003**	0.001	0.002	0.004	**0.007**	**0.020**
Incinerators																							
CF-K-59701	13	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.225	0.190	0.242	**0.657**	0.224	0.241	0.094	**0.559**	0.276	0.259	0.106	**0.641**	0.276	0.259	0.277	**0.813**	**2.670**
CF-K-59702	14	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.241	0.172	0.256	**0.669**	0.244	0.008	0.258	**0.510**	0.258	0.259	0.292	**0.809**	0.258	0.259	0.276	**0.793**	**2.781**
Flares																							
CF-X-35002	15	HP Flare	261 MMscfd	gas	0.370		0.1	0.1	0.3	**0.5**	0.2	0.1	0.1	**0.4**	0.3	0.4	0.1	**0.8**	0.1	0.1	0.1	**0.3**	**1.9**
CF-X-35012	16	LP Flare	212 MMscfd	gas	0.370		3.9	3.4	4.9	**12.2**	2.6	2.8	3.2	**8.6**	5.6	2.1	2.8	**10.5**	0.1	0.1	0.1	**0.3**	**31.5**
Portable Flares	17	Portable Flares	3.9 MMscfd	gas	0.370		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Well Pad Heaters																							
CD2-H-30001	18	OPS Production Heater	20.0 MMBtu/hr	gas	0.003		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CD3-U-303007-H1	19	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.082		0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.4**	**1.4**
CD4-U-304007-H1	20	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.082		0.1	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.3**	**1.2**
Well Pad Engines																							
CD3-U-703001-G1	21	CD3 Standby Generator - CAT 3412E	600 kW	liquid	0.850		0.006	0.009	0.010	**0.024**	0.003	0.005	0.003	**0.010**	0.003	0.030	0.000	**0.032**	0.005	0.003	0.000	**0.008**	**0.075**
CD3-U-703201-G1	622	CD3 Standby Generator - CAT C27	800 kW	liquid		2.430	0.003	0.003	0.005	**0.011**	0.001	0.001	0.003	**0.005**	0.001	0.013	0.000	**0.014**	0.003	0.001	0.000	**0.004**	**0.034**
Doyon Drilling Rig 19 at CD1/CD2																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.017	0.008	0.000	**0.025**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.025**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.007	0.017	0.000	**0.024**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.024**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.433		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.950		0.000	0.000	0.000	**0.000**	0.036	0.016	0.000	**0.053**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.053**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.950		0.000	0.000	0.000	**0.000**	0.003	0.001	0.000	**0.004**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.004**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.649		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.649		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	2.664		0.000	0.000	0.000	**0.000**	0.000	0.021	0.007	**0.028**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.028**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	2.664		0.000	0.000	0.000	**0.000**	0.000	0.021	0.007	**0.028**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.028**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.036		0.000	0.000	0.000	**0.000**	0.004	0.021	0.000	**0.026**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.026**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.036		0.000	0.000	0.000	**0.000**	0.007	0.042	0.000	**0.049**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.049**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.036		0.000	0.000	0.000	**0.000**	0.004	0.024	0.000	**0.028**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.028**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.036		0.000	0.000	0.000	**0.000**	0.006	0.002	0.000	**0.008**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.008**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.036		0.000	0.000	0.000	**0.000**	0.007	0.000	0.000	**0.007**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.007**
MP1	39	Mud Plant Boiler	1.30 MMBtu/hr	liquid	0.036		0.010	0.010	0.011	**0.031**	0.011	0.009	0.007	**0.027**	0.005	0.006	0.006	**0.018**	0.008	0.009	0.010	**0.027**	**0.103**
BP1	40	Detroit 6063-GK35 Power	300 kW	liquid	0.058		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
BP2	41	Detroit 6043-GK35 Power	160 kW	liquid	0.059		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	CO EF	CO EF	CO Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Doyon Drilling Rig 19 at CD3																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.003	**0.003**	0.005	0.000	0.000	**0.005**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.007**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.870	0.007	0.000	0.009	**0.016**	0.018	0.000	0.000	**0.018**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.034**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.003	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.433		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.870	0.023	0.000	0.009	**0.031**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.032**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.950		0.000	0.000	0.000	**0.000**	0.009	0.000	0.000	**0.009**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.009**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.950		0.003	0.000	0.025	**0.028**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.029**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.649		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.649		0.576	0.000	0.025	**0.601**	0.357	0.000	0.000	**0.357**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.958**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	2.664		0.005	0.037	0.026	**0.067**	0.007	0.000	0.000	**0.007**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.074**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	2.664		0.005	0.037	0.026	**0.067**	0.007	0.000	0.000	**0.007**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.074**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.036		0.014	0.041	0.045	**0.099**	0.032	0.000	0.000	**0.032**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.131**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.036		0.015	0.042	0.045	**0.102**	0.035	0.000	0.000	**0.035**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.137**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.036		0.008	0.026	0.028	**0.062**	0.022	0.000	0.000	**0.022**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.084**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.036		0.012	0.038	0.039	**0.089**	0.030	0.000	0.000	**0.030**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.119**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.036		0.020	0.052	0.057	**0.129**	0.031	0.000	0.000	**0.031**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.160**
Doyon Drilling Rig 19 at CD4																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.018	0.009	**0.027**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	**0.028**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.870	0.018	0.000	0.000	**0.018**	0.000	0.010	0.009	**0.019**	0.000	0.013	0.004	**0.017**	0.000	0.009	0.006	**0.015**	**0.069**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.433		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.870	0.011	0.000	0.000	**0.011**	0.000	0.001	0.000	**0.001**	0.000	0.039	0.018	**0.057**	0.000	0.009	0.000	**0.009**	**0.078**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.870	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.006	**0.006**	**0.006**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.950		0.025	0.000	0.000	**0.025**	0.000	0.035	0.000	**0.035**	0.000	0.003	0.000	**0.003**	0.000	0.000	0.000	**0.000**	**0.063**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.950		0.021	0.000	0.000	**0.021**	0.000	0.000	0.003	**0.004**	0.000	0.007	0.003	**0.010**	0.000	0.001	0.004	**0.006**	**0.040**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.649		0.010	0.000	0.000	**0.010**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.050	**0.050**	0.000	0.000	0.000	**0.000**	**0.060**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	2.649		0.060	0.000	0.000	**0.060**	0.114	0.000	0.000	**0.114**	0.000	0.367	0.218	**0.586**	0.000	0.000	0.000	**0.000**	**0.760**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	2.664		0.021	0.000	0.000	**0.021**	0.000	0.000	0.000	**0.000**	0.005	0.002	0.021	**0.028**	0.000	0.002	0.046	**0.049**	**0.097**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	2.664		0.021	0.000	0.000	**0.021**	0.000	0.000	0.000	**0.000**	0.005	0.002	0.021	**0.028**	0.000	0.002	0.046	**0.049**	**0.097**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.036		0.029	0.000	0.000	**0.029**	0.000	0.000	0.018	**0.018**	0.035	0.036	0.028	**0.099**	0.038	0.041	0.045	**0.123**	**0.269**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.036		0.029	0.000	0.000	**0.029**	0.000	0.001	0.027	**0.028**	0.000	0.000	0.030	**0.030**	0.046	0.044	0.045	**0.135**	**0.223**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.036		0.018	0.000	0.000	**0.018**	0.000	0.000	0.007	**0.007**	0.006	0.012	0.023	**0.041**	0.029	0.027	0.028	**0.083**	**0.149**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.036		0.029	0.000	0.000	**0.029**	0.000	0.001	0.016	**0.018**	0.000	0.000	0.022	**0.023**	0.036	0.035	0.037	**0.109**	**0.178**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.036		0.038	0.000	0.000	**0.038**	0.000	0.000	0.003	**0.003**	0.000	0.001	0.002	**0.003**	0.002	0.039	0.056	**0.098**	**0.142**
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																							
Ball Mill Engine		Cummins LTA-1061 Ball Mill Engine	230 kW	liquid	0.950		0.044	0.000	0.026	**0.071**	0.064	0.063	0.020	**0.147**	0.000	0.154	0.078	**0.231**	0.000	0.009	0.030	**0.039**	**0.488**
Well Service Heater	42	Various	10.0 MMBtu/hr	liquid	0.036		0.003	0.008	0.004	**0.014**	0.004	0.002	0.002	**0.008**	0.003	0.002	0.005	**0.010**	0.003	0.003	0.006	**0.011**	**0.044**
Well Service Engines	42	Various	Various	liquid	0.858		0.143	0.204	0.170	**0.517**	0.160	0.153	0.136	**0.449**	0.138	0.129	0.187	**0.454**	0.153	0.121	0.179	**0.453**	**1.873**
Well Frac Unit Engine	43	Various	Various	liquid	0.851		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	15.4	16.4	16.8	**48.6**	16.0	12.1	11.8	**39.9**	17.3	11.5	15.5	**44.3**	14.7	14.3	14.1	**43.1**	**175.9**
w/o NREs	14.4	16.1	16.5	**47.0**	15.2	11.7	11.7	**38.5**	17.1	10.8	14.9	**42.8**	14.6	14.1	13.8	**42.5**	**170.8**
w/o D19	14.4	16.1	16.5	**47.0**	15.2	11.8	11.7	**38.8**	17.2	11.0	15.0	**43.3**	14.6	14.1	13.8	**42.4**	**171.5**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	VOC EF	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																							
CF-C-33012-TB (C1)	1	N-P MS5382	38,000 hp	gas	0.002		0.3	0.2	0.3	**0.8**	0.3	0.3	0.3	**0.8**	0.3	0.2	0.2	**0.7**	0.3	0.3	0.3	**0.8**	**3.1**
CF-G-70001-TB (E1)	2	N-P PG5371	26,410 kW	gas	0.002		0.2	0.1	0.2	**0.5**	0.2	0.1	0.1	**0.4**	0.1	0.1	0.1	**0.4**	0.1	0.1	0.2	**0.4**	**1.7**
CF-G-70002-TB (E2)	3	N-P PGT10+	11,270 kW	gas	0.002		0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.1	0.1	0.1	**0.2**	**0.6**
~~**CF-G-70002-TB**~~	~~3~~	~~**N-P PGT10+**~~	~~**11,270 kW**~~	~~**liquid**~~	~~0.006~~		~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~**0.000**~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.002		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.002		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.002		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**Solar Taurus 60S (Dual-Fired)**	**5.5 MW**	**liquid**	0.0004		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.002		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.002		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	**0.1**
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.002		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Heaters																							
CF-H-31003A	6	Born Crude Heater	65.60 MMBtu/hr	gas	0.010		0.1	0.1	0.1	**0.2**	0.1	0.1	0.1	**0.2**	0.1	0.1	0.0	**0.2**	0.1	0.1	0.1	**0.2**	**0.8**
CF-H-31003B	7	Born Crude Heater	65.60 MMBtu/hr	gas	0.010		0.1	0.1	0.1	**0.3**	0.1	0.1	0.1	**0.2**	0.1	0.0	0.1	**0.2**	0.1	0.1	0.1	**0.2**	**0.9**
CF-H-64004 [Fuel Gas]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.010		0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
CF-H-64004 [Liquid Fuel]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.001		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-H-64005 [Fuel Gas]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.010		0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	**0.3**
CF-H-64005 [Liquid Fuel]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.001		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-U-68007-H1	10	Hot Oil Heater	36.75 MMBtu/hr	gas	0.004		0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.1**	**0.2**
Engines																							
CF-G-70008 (E8)	11	Cummins KTTA50-G2-V16	1,500 kW	liquid	0.082		0.002	0.005	0.002	**0.010**	0.001	0.002	0.002	**0.005**	0.005	0.004	0.001	**0.009**	0.001	0.000	0.002	**0.004**	**0.027**
CF-G-70375	12	Detroit Diesel 12V2000-R1237k35	600 kW	liquid	0.082		0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	**0.002**
Incinerators																							
CF-K-59701	13	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.052	0.044	0.056	**0.152**	0.052	0.056	0.021	**0.128**	0.064	0.060	0.024	**0.147**	0.064	0.060	0.064	**0.188**	**0.615**
CF-K-59702	14	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.056	0.040	0.059	**0.155**	0.057	0.001	0.060	**0.117**	0.060	0.060	0.068	**0.188**	0.060	0.060	0.064	**0.184**	**0.643**
Flares																							
CF-X-35002	15	HP Flare	261 MMscfd	gas	0.063		0.0	0.0	0.1	**0.1**	0.0	0.0	0.0	**0.1**	0.0	0.1	0.0	**0.1**	0.0	0.0	0.0	**0.0**	**0.3**
CF-X-35012	16	LP Flare	212 MMscfd	gas	0.063		0.7	0.6	0.8	**2.1**	0.4	0.5	0.5	**1.5**	0.9	0.4	0.5	**1.8**	0.0	0.0	0.0	**0.0**	**5.4**
Portable Flares	17	Portable Flares	3.9 MMscfd	gas	0.063		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.0**
Well Pad Heaters																							
CD2-H-30001	18	OPS Production Heater	20.0 MMBtu/hr	gas	0.010		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
CD3-U-303007-H1	19	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.005		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
CD4-U-304007-H1	20	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.005		0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	**0.1**
Well Pad Engines																							
CD3-U-703001-G1	21	CD3 Standby Generator - CAT 3412E	600 kW	liquid	0.082		0.001	0.001	0.001	**0.002**	0.000	0.000	0.000	**0.001**	0.000	0.003	0.000	**0.003**	0.001	0.000	0.000	**0.001**	**0.007**
CD3-U-703201-G1	622	CD3 Standby Generator - CAT C27	800 kW	liquid		0.280	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.001	0.000	**0.002**	0.000	0.000	0.000	**0.000**	**0.004**
Doyon Drilling Rig 19 at CD1/CD2																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.007	0.004	0.000	**0.011**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.011**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.003	0.008	0.000	**0.011**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.011**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.082		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.350		0.000	0.000	0.000	**0.000**	0.013	0.006	0.000	**0.019**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.019**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.350		0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.056		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.056		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.320		0.000	0.000	0.000	**0.000**	0.000	0.003	0.001	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.320		0.000	0.000	0.000	**0.000**	0.000	0.003	0.001	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.002		0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.002		0.000	0.000	0.000	**0.000**	0.000	0.003	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.002		0.000	0.000	0.000	**0.000**	0.000	0.002	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.002		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.002		0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
MP1	39	Mud Plant Boiler	1.30 MMBtu/hr	liquid	0.002		0.001	0.001	0.001	**0.002**	0.001	0.001	0.001	**0.002**	0.000	0.000	0.000	**0.001**	0.001	0.001	0.001	**0.002**	**0.007**
BP1	40	Detroit 6063-GK35 Power	300 kW	liquid	0.082		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
BP2	41	Detroit 6043-GK35 Power	160 kW	liquid	0.082		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	VOC EF	VOC EF	VOC Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Doyon Drilling Rig 19 at CD3																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.001	**0.001**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.390	0.003	0.000	0.004	**0.007**	0.008	0.000	0.000	**0.008**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.015**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.082		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.390	0.010	0.000	0.004	**0.014**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.014**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.350		0.000	0.000	0.000	**0.000**	0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.350		0.001	0.000	0.009	**0.010**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.011**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.056		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.056		0.012	0.000	0.001	**0.013**	0.008	0.000	0.000	**0.008**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.020**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.320		0.001	0.004	0.003	**0.008**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.009**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.320		0.001	0.004	0.003	**0.008**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.009**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.002		0.001	0.003	0.003	**0.007**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.009**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.002		0.001	0.003	0.003	**0.007**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.009**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.002		0.001	0.002	0.002	**0.004**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.006**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.002		0.001	0.003	0.003	**0.006**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.008**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.002		0.001	0.004	0.004	**0.009**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.011**
Doyon Drilling Rig 19 at CD4																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.008	0.004	**0.012**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.012**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.390	0.008	0.000	0.000	**0.008**	0.000	0.005	0.004	**0.009**	0.000	0.006	0.002	**0.008**	0.000	0.004	0.003	**0.007**	**0.031**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.082		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.390	0.005	0.000	0.000	**0.005**	0.000	0.000	0.000	**0.000**	0.000	0.018	0.008	**0.026**	0.000	0.004	0.000	**0.004**	**0.035**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.390	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.003	**0.003**	**0.003**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.350		0.009	0.000	0.000	**0.009**	0.000	0.013	0.000	**0.013**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	**0.023**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.350		0.008	0.000	0.000	**0.008**	0.000	0.000	0.001	**0.001**	0.000	0.002	0.001	**0.004**	0.000	0.001	0.002	**0.002**	**0.015**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.056		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.000**	**0.001**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.056		0.001	0.000	0.000	**0.001**	0.002	0.000	0.000	**0.002**	0.000	0.008	0.005	**0.012**	0.000	0.000	0.000	**0.000**	**0.016**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.320		0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.001	0.000	0.003	**0.003**	0.000	0.000	0.006	**0.006**	**0.012**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.320		0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.001	0.000	0.003	**0.003**	0.000	0.000	0.006	**0.006**	**0.012**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.002		0.002	0.000	0.000	**0.002**	0.000	0.000	0.001	**0.001**	0.002	0.002	0.002	**0.007**	0.003	0.003	0.003	**0.008**	**0.018**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.002		0.002	0.000	0.000	**0.002**	0.000	0.000	0.002	**0.002**	0.000	0.000	0.002	**0.002**	0.003	0.003	0.003	**0.009**	**0.015**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.002		0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.002	**0.003**	0.002	0.002	0.002	**0.006**	**0.010**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.002		0.002	0.000	0.000	**0.002**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.002	**0.002**	0.002	0.002	0.003	**0.007**	**0.012**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.002		0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.003	0.004	**0.007**	**0.010**
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																							
Ball Mill Engine		Cummins LTA-1061 Ball Mill Engine	230 kW	liquid	0.350		0.016	0.000	0.010	**0.026**	0.024	0.023	0.007	**0.054**	0.000	0.057	0.029	**0.085**	0.000	0.003	0.011	**0.014**	**0.180**
Well Service Heater	42	Various	10.0 MMBtu/hr	liquid	0.001		0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
Well Service Engines	42	Various	Various	liquid	0.104		0.017	0.025	0.021	**0.063**	0.019	0.019	0.017	**0.055**	0.017	0.016	0.023	**0.055**	0.019	0.015	0.022	**0.055**	**0.228**
Well Frac Unit Engine	43	Various	Various	liquid	0.084		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	1.7	1.4	1.9	**5.0**	1.4	1.4	1.4	**4.2**	1.8	1.3	1.3	**4.3**	0.9	0.9	1.0	**2.7**	**16.2**
w/o NREs	1.6	1.4	1.8	**4.8**	1.3	1.3	1.3	**3.9**	1.8	1.2	1.2	**4.1**	0.9	0.9	0.9	**2.6**	**15.5**
w/o D19	1.6	1.4	1.8	**4.9**	1.4	1.3	1.3	**4.0**	1.8	1.2	1.3	**4.3**	0.9	0.9	0.9	**2.6**	**15.8**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
					SO_2 Emission Rate (tons)																
Gas Turbines																					
CF-C-33012-TB (C1)	1	N-P MS5382	38,000 hp	gas	0.70	0.62	0.68	**2.00**	0.65	0.69	0.52	**1.86**	0.49	0.48	0.47	**1.45**	0.51	0.50	0.50	**1.51**	**6.82**
CF-G-70001-TB (E1)	2	N-P PG5371	26,410 kW	gas	0.51	0.45	0.52	**1.48**	0.50	0.48	0.36	**1.35**	0.36	0.33	0.34	**1.03**	0.35	0.38	0.38	**1.11**	**4.96**
CF-G-70002-TB (E2)	3	N-P PGT10+	11,270 kW	gas	0.16	0.15	0.16	**0.47**	0.13	0.16	0.10	**0.38**	0.00	0.06	0.02	**0.08**	0.13	0.12	0.11	**0.36**	**1.29**
~~**CF-G-70002-TB**~~	~~3~~	~~**N-P PGT10+**~~	~~**11,270 kW**~~	~~**liquid**~~	~~0.0E+00~~	~~0.0E+00~~	~~0.0E+00~~	~~**0.0E+00**~~	~~0.0E+00~~	~~0.0E+00~~	~~0.0E+00~~	~~**0.0E+00**~~	~~0.0E+00~~	~~0.0E+00~~	~~0.0E+00~~	~~**0.0E+00**~~	~~0.0E+00~~	~~0.0E+00~~	~~0.0E+00~~	~~**0.0E+00**~~	~~**0.0E+00**~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.02	**0.02**	0.04	0.00	0.00	**0.05**	0.00	0.00	0.00	**0.00**	**0.07**
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.00	0.02	0.00	**0.02**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.03**
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**Solar Taurus 60S (Dual-Fired)**	**5.5 MW**	**liquid**	9.1E-06	9.5E-06	4.0E-05	**5.8E-05**	1.6E-05	9.2E-06	8.9E-06	**3.4E-05**	0.0E+00	6.7E-05	3.6E-05	**1.0E-04**	8.3E-06	2.1E-05	1.1E-05	**4.0E-05**	**2.4E-04**
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.04	0.01	0.07	**0.11**	0.02	0.00	0.00	**0.02**	**0.14**
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.00	0.00	0.00	**0.00**	0.01	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.02**
Heaters																					
CF-H-31003A	6	Born Crude Heater	65.60 MMBtu/hr	gas	0.04	0.04	0.04	**0.12**	0.03	0.04	0.03	**0.10**	0.03	0.03	0.02	**0.08**	0.02	0.03	0.02	**0.07**	**0.37**
CF-H-31003B	7	Born Crude Heater	65.60 MMBtu/hr	gas	0.04	0.04	0.04	**0.12**	0.04	0.04	0.03	**0.11**	0.03	0.01	0.03	**0.07**	0.03	0.02	0.02	**0.07**	**0.38**
CF-H-64004 [Fuel Gas]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.01	0.01	0.02	**0.05**	0.01	0.00	0.01	**0.02**	0.01	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.03**	**0.13**
CF-H-64004 [Liquid Fuel]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.0E+00	0.0E+00	3.3E-06	**3.3E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	2.0E-06	0.0E+00	**2.0E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**5.3E-06**
CF-H-64005 [Fuel Gas]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.02	0.02	0.02	**0.05**	0.02	0.02	0.00	**0.04**	0.00	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.03**	**0.14**
CF-H-64005 [Liquid Fuel]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	3.1E-07	0.0E+00	**3.1E-07**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**3.1E-07**
CF-U-68007-H1	10	Hot Oil Heater	36.75 MMBtu/hr	gas	0.02	0.02	0.02	**0.07**	0.02	0.02	0.02	**0.06**	0.02	0.01	0.01	**0.04**	0.02	0.01	0.01	**0.05**	**0.21**
Engines																					
CF-G-70008 (E8)	11	Cummins KTTA50-G2-V16	1,500 kW	liquid	7.3E-06	2.0E-05	8.6E-06	**3.6E-05**	2.3E-06	8.3E-06	7.1E-06	**1.8E-05**	1.8E-05	1.4E-05	3.1E-06	**3.5E-05**	4.3E-06	0.0E+00	8.9E-06	**1.3E-05**	**1.0E-04**
CF-G-70375	12	Detroit Diesel 12V2000-R1237k35	600 kW	liquid	3.2E-07	2.8E-07	1.4E-06	**2.0E-06**	0.0E+00	1.3E-06	6.7E-07	**1.9E-06**	2.8E-07	7.1E-07	0.0E+00	**9.9E-07**	3.6E-07	6.7E-07	1.3E-06	**2.4E-06**	**7.3E-06**
Incinerators																					
CF-K-59701	13	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse	0.090	0.076	0.097	**0.26**	0.090	0.097	0.036	**0.223**	0.111	0.104	0.041	**0.256**	0.111	0.104	0.111	**0.326**	**1.070**
CF-K-59702	14	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse	0.097	0.069	0.104	**0.27**	0.099	0.001	0.104	**0.203**	0.104	0.104	0.118	**0.326**	0.104	0.104	0.111	**0.319**	**1.119**
Flares																					
CF-X-35002	15	HP Flare	261 MMscfd	gas	0.00	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.00**	**0.02**
CF-X-35012	16	LP Flare	212 MMscfd	gas	0.05	0.05	0.06	**0.17**	0.03	0.04	0.03	**0.10**	0.06	0.02	0.03	**0.11**	0.00	0.00	0.00	**0.00**	**0.38**
Portable Flares	17	Portable Flares	3.9 MMscfd	gas	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Well Pad Heaters																					
CD2-H-30001	18	OPS Production Heater	20.0 MMBtu/hr	gas	0.00	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.01**	**0.04**
CD3-U-303007-H1	19	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.01	0.01	0.01	**0.02**	0.01	0.01	0.00	**0.02**	0.00	0.00	0.01	**0.01**	0.01	0.01	0.01	**0.02**	**0.07**
CD4-U-304007-H1	20	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.01	0.01	0.01	**0.02**	0.01	0.01	0.00	**0.02**	0.00	0.00	0.00	**0.01**	0.00	0.00	0.00	**0.01**	**0.06**
Well Pad Engines																					
CD3-U-703001-G1	21	CD3 Standby Generator - CAT 3412E	600 kW	liquid	2.0E-06	3.2E-06	3.6E-06	**8.8E-06**	9.7E-07	1.7E-06	9.7E-07	**3.7E-06**	9.6E-07	1.1E-05	0.0E+00	**1.2E-05**	2.0E-06	9.7E-07	0.0E+00	**2.9E-06**	**2.7E-05**
CD3-U-703201-G1	622	CD3 Standby Generator - CAT C27	800 kW	liquid	2.6E-06	3.0E-06	4.8E-06	**1.0E-05**	1.4E-06	1.1E-06	2.8E-06	**5.2E-06**	1.3E-06	1.2E-05	0.0E+00	**1.4E-05**	2.6E-06	1.3E-06	0.0E+00	**3.9E-06**	**3.3E-05**
Doyon Drilling Rig 19 at CD1/CD2																					
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	4.1E-05	2.0E-05	0.0E+00	**6.1E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**6.1E-05**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	1.7E-05	4.2E-05	0.0E+00	**5.9E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**5.9E-05**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	1.2E-05	5.3E-06	0.0E+00	**1.7E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.7E-05**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	1.0E-06	3.4E-07	0.0E+00	**1.4E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.4E-06**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	2.4E-06	8.0E-07	**3.2E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**3.2E-06**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	2.4E-06	8.0E-07	**3.2E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**3.2E-06**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	3.7E-05	1.8E-04	0.0E+00	**2.2E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**2.2E-04**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	6.1E-05	3.5E-04	0.0E+00	**4.1E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**4.1E-04**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	3.1E-05	2.0E-04	0.0E+00	**2.4E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**2.4E-04**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	5.4E-05	1.5E-05	0.0E+00	**6.9E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**6.9E-05**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	6.3E-05	0.0E+00	0.0E+00	**6.3E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**6.3E-05**
MP1	39	Mud Plant Boiler	1.30 MMBtu/hr	liquid	8.5E-05	8.4E-05	9.3E-05	**2.6E-04**	8.9E-05	7.4E-05	6.2E-05	**2.3E-04**	4.3E-05	5.0E-05	5.4E-05	**1.5E-04**	6.8E-05	7.7E-05	8.6E-05	**2.3E-04**	**8.6E-04**
BP1	40	Detroit 6063-GK35 Power	300 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
BP2	41	Detroit 6043-GK35 Power	160 kW	liquid	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	SO$_2$ Emission Rate (tons)																	
						Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Doyon Drilling Rig 19 at CD3																						
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.0E+00	0.0E+00	6.5E-06	**6.5E-06**	1.2E-05	0.0E+00	0.0E+00	**1.2E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.8E-05**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		1.7E-05	0.0E+00	2.2E-05	**3.9E-05**	4.5E-05	0.0E+00	0.0E+00	**4.5E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**8.4E-05**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.0E+00	0.0E+00	6.5E-06	**6.5E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**6.5E-06**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		5.6E-05	0.0E+00	2.2E-05	**7.8E-05**	2.2E-06	0.0E+00	0.0E+00	**2.2E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**8.0E-05**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	2.8E-06	0.0E+00	0.0E+00	**2.8E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**2.8E-06**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid		9.0E-07	0.0E+00	8.1E-06	**9.0E-06**	2.3E-07	0.0E+00	0.0E+00	**2.3E-07**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**9.3E-06**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid		6.7E-05	0.0E+00	2.9E-06	**7.0E-05**	4.2E-05	0.0E+00	0.0E+00	**4.2E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.1E-04**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid		5.4E-07	4.3E-06	2.9E-06	**7.8E-06**	8.0E-07	0.0E+00	0.0E+00	**8.0E-07**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**8.6E-06**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid		5.4E-07	4.3E-06	2.9E-06	**7.8E-06**	8.0E-07	0.0E+00	0.0E+00	**8.0E-07**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**8.6E-06**
Boiler 1	34	Superior Boiler	100 hp	liquid		1.2E-04	3.4E-04	3.8E-04	**8.4E-04**	2.7E-04	0.0E+00	0.0E+00	**2.7E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.1E-03**
Boiler 2	35	Superior Boiler	100 hp	liquid		1.2E-04	3.5E-04	3.8E-04	**8.6E-04**	2.9E-04	0.0E+00	0.0E+00	**2.9E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.2E-03**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid		6.8E-05	2.2E-04	2.4E-04	**5.2E-04**	1.8E-04	0.0E+00	0.0E+00	**1.8E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**7.0E-04**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid		9.9E-05	3.2E-04	3.3E-04	**7.5E-04**	2.5E-04	0.0E+00	0.0E+00	**2.5E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.0E-03**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid		1.7E-04	4.4E-04	4.8E-04	**1.1E-03**	2.6E-04	0.0E+00	0.0E+00	**2.6E-04**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.4E-03**
Doyon Drilling Rig 19 at CD4																						
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	4.5E-05	2.2E-05	**6.7E-05**	0.0E+00	2.2E-06	0.0E+00	**2.2E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**6.9E-05**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		4.4E-05	0.0E+00	0.0E+00	**4.4E-05**	0.0E+00	2.6E-05	2.2E-05	**4.7E-05**	0.0E+00	3.1E-05	1.1E-05	**4.2E-05**	0.0E+00	2.3E-05	1.5E-05	**3.8E-05**	**1.7E-04**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		1.1E-06	0.0E+00	0.0E+00	**1.1E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**1.1E-06**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		2.7E-05	0.0E+00	0.0E+00	**2.7E-05**	0.0E+00	2.2E-06	0.0E+00	**2.2E-06**	0.0E+00	9.7E-05	4.4E-05	**1.4E-04**	0.0E+00	2.3E-05	0.0E+00	**2.3E-05**	**1.9E-04**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	1.5E-05	**1.5E-05**	**1.5E-05**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid		8.1E-06	0.0E+00	0.0E+00	**8.1E-06**	0.0E+00	1.1E-05	0.0E+00	**1.1E-05**	0.0E+00	8.1E-07	0.0E+00	**8.1E-07**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**2.0E-05**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid		6.8E-06	0.0E+00	0.0E+00	**6.8E-06**	0.0E+00	1.1E-07	1.1E-06	**1.2E-06**	0.0E+00	2.1E-06	1.1E-06	**3.3E-06**	0.0E+00	4.5E-07	1.4E-06	**1.8E-06**	**1.3E-05**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid		1.2E-06	0.0E+00	0.0E+00	**1.2E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	5.8E-06	**5.8E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**6.9E-06**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid		6.9E-06	0.0E+00	0.0E+00	**6.9E-06**	1.3E-05	0.0E+00	0.0E+00	**1.3E-05**	0.0E+00	4.3E-05	2.5E-05	**6.8E-05**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**8.8E-05**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid		2.4E-06	0.0E+00	0.0E+00	**2.4E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	5.4E-07	2.7E-07	2.4E-06	**3.2E-06**	0.0E+00	2.7E-07	5.4E-06	**5.6E-06**	**1.1E-05**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid		2.4E-06	0.0E+00	0.0E+00	**2.4E-06**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	5.4E-07	2.7E-07	2.4E-06	**3.2E-06**	0.0E+00	2.7E-07	5.4E-06	**5.6E-06**	**1.1E-05**
Boiler 1	34	Superior Boiler	100 hp	liquid		2.5E-04	0.0E+00	0.0E+00	**2.5E-04**	0.0E+00	2.6E-06	1.5E-04	**1.5E-04**	2.9E-04	3.0E-04	2.4E-04	**8.3E-04**	3.2E-04	3.4E-04	3.8E-04	**1.0E-03**	**2.3E-03**
Boiler 2	35	Superior Boiler	100 hp	liquid		2.5E-04	0.0E+00	0.0E+00	**2.5E-04**	0.0E+00	1.3E-05	2.3E-04	**2.4E-04**	0.0E+00	0.0E+00	2.6E-04	**2.6E-04**	3.9E-04	3.7E-04	3.8E-04	**1.1E-03**	**1.9E-03**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid		1.5E-04	0.0E+00	0.0E+00	**1.5E-04**	0.0E+00	0.0E+00	6.2E-05	**6.2E-05**	5.0E-05	9.8E-05	2.0E-04	**3.4E-04**	2.4E-04	2.3E-04	2.3E-04	**7.0E-04**	**1.3E-03**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid		2.5E-04	0.0E+00	0.0E+00	**2.5E-04**	0.0E+00	1.2E-05	1.4E-04	**1.5E-04**	2.4E-06	4.9E-07	1.9E-04	**1.9E-04**	3.1E-04	3.0E-04	3.1E-04	**9.2E-04**	**1.5E-03**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid		3.2E-04	0.0E+00	0.0E+00	**3.2E-04**	0.0E+00	0.0E+00	2.7E-05	**2.7E-05**	0.0E+00	1.1E-05	1.8E-05	**2.9E-05**	1.8E-05	3.3E-04	4.7E-04	**8.2E-04**	**1.2E-03**
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																						
Ball Mill Engine		Cummins LTA-1061 Ball Mill Engine	230 kW	liquid		1.4E-05	0.0E+00	8.5E-06	**2.3E-05**	2.1E-05	2.0E-05	6.5E-06	**4.8E-05**	0.0E+00	5.0E-05	2.5E-05	**7.5E-05**	0.0E+00	3.0E-06	9.7E-06	**1.3E-05**	**1.6E-04**
Well Service Heater	42	Various	10.0 MMBtu/hr	liquid		2.3E-05	6.7E-05	3.0E-05	**1.2E-04**	3.2E-05	2.0E-05	1.8E-05	**7.0E-05**	2.1E-05	2.0E-05	4.4E-05	**8.5E-05**	2.1E-05	2.2E-05	5.1E-05	**9.5E-05**	**3.7E-04**
Well Service Engines	42	Various	Various	liquid		5.1E-05	7.3E-05	6.1E-05	**1.9E-04**	5.7E-05	5.5E-05	4.9E-05	**1.6E-04**	5.0E-05	4.6E-05	6.7E-05	**1.6E-04**	5.5E-05	4.3E-05	6.4E-05	**1.6E-04**	**6.7E-04**
Well Frac Unit Engine	43	Various	Various	liquid		0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	0.0E+00	0.0E+00	0.0E+00	**0.0E+00**	**0.0E+00**

Turbines MMBtu/hr is based on LHV	**Total**	1.8	1.6	1.8	**5.1**	1.7	1.6	1.3	**4.5**	1.3	1.2	1.2	**3.7**	1.3	1.3	1.3	**4.0**	**17.3**
Heaters MMBtu/hr is based on LHV	**w/o NREs**	1.8	1.6	1.8	**5.1**	1.7	1.6	1.3	**4.5**	1.3	1.2	1.2	**3.7**	1.3	1.3	1.3	**4.0**	**17.3**
All other souces MMBtu/hr are based on HHV	**w/o D19**	1.8	1.6	1.8	**5.1**	1.7	1.6	1.3	**4.5**	1.3	1.2	1.2	**3.7**	1.3	1.3	1.3	**4.0**	**17.3**

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	PM_{10} EF	PM_{10} EF	PM_{10} Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Gas Turbines																							
CF-C-33012-TB (C1)	1	N-P MS5382	38,000 hp	gas	0.007		0.87	0.77	0.85	**2.49**	0.82	0.86	0.82	**2.50**	0.78	0.75	0.75	**2.28**	0.80	0.79	0.84	**2.43**	**9.70**
CF-G-70001-TB (E1)	2	N-P PG5371	26,410 kW	gas	0.007		0.65	0.58	0.67	**1.91**	0.65	0.62	0.58	**1.85**	0.58	0.54	0.55	**1.67**	0.58	0.61	0.65	**1.84**	**7.27**
CF-G-70002-TB (E2)	3	N-P PGT10+	11,270 kW	gas	0.012		0.37	0.33	0.36	**1.06**	0.29	0.37	0.28	**0.93**	0.01	0.18	0.05	**0.23**	0.36	0.36	0.35	**1.07**	**3.29**
~~**CF-G-70002-TB**~~	~~3~~	~~**N-P PGT10+**~~	~~**11,270 kW**~~	~~**liquid**~~	~~0.043~~		~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~0.000~~	~~0.000~~	~~0.000~~	~~**0.000**~~	~~**0.000**~~
CF-G-70300-TB [Lean Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.007		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
CF-G-70300-TB [Rich Fuel Gas (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.007		0.00	0.00	0.00	**0.00**	0.01	0.00	0.03	**0.03**	0.07	0.01	0.00	**0.07**	0.00	0.00	0.00	**0.00**	**0.11**
CF-G-70300-TB [NON-Low Emissions Mode (S1)]	4	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.007		0.00	0.03	0.00	**0.03**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.03**
CF-G-70300-TB [Liquid Fuel (S1)]	**4**	**Solar Taurus 60S (Dual-Fired)**	**5.5 MW**	**liquid**	0.012		0.000	0.000	0.001	**0.002**	0.001	0.000	0.000	**0.001**	0.000	0.002	0.001	**0.004**	0.000	0.001	0.000	**0.001**	**0.009**
CF-G-70350-TB [Lean Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.007		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
CF-G-70350-TB [Rich Fuel Gas (S2)]	5	Solar Taurus 60S (Gas-Fired)	5.5 MW	gas	0.007		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.01**	0.06	0.02	0.10	**0.18**	0.03	0.00	0.00	**0.04**	**0.22**
CF-G-70350-TB [NON-Low Emissions Mode (S2)]	5	Solar Taurus 60S (Dual-Fired)	5.5 MW	gas	0.007		0.00	0.00	0.00	**0.00**	0.02	0.00	0.00	**0.02**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.02**
Heaters																							
CF-H-31003A	6	Born Crude Heater	65.60 MMBtu/hr	gas	0.007		0.06	0.06	0.06	**0.18**	0.05	0.06	0.06	**0.17**	0.05	0.06	0.03	**0.15**	0.04	0.05	0.05	**0.14**	**0.63**
CF-H-31003B	7	Born Crude Heater	65.60 MMBtu/hr	gas	0.007		0.07	0.06	0.06	**0.19**	0.06	0.06	0.06	**0.18**	0.05	0.03	0.06	**0.14**	0.05	0.05	0.05	**0.14**	**0.65**
CF-H-64004 [Fuel Gas]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.007		0.02	0.02	0.02	**0.07**	0.02	0.00	0.02	**0.04**	0.03	0.01	0.01	**0.05**	0.02	0.02	0.02	**0.07**	**0.23**
CF-H-64004 [Liquid Fuel]	8	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.007		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-H-64005 [Fuel Gas]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	gas	0.007		0.03	0.02	0.03	**0.08**	0.03	0.03	0.01	**0.06**	0.00	0.02	0.03	**0.05**	0.02	0.02	0.02	**0.05**	**0.24**
CF-H-64005 [Liquid Fuel]	9	Thermoflux UHM Heater	20.00 MMBtu/hr	liquid	0.007		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
CF-U-68007-H1	10	Hot Oil Heater	36.75 MMBtu/hr	gas	0.006		0.03	0.03	0.03	**0.08**	0.03	0.03	0.03	**0.08**	0.02	0.02	0.02	**0.07**	0.02	0.02	0.02	**0.07**	**0.30**
Engines																							
CF-G-70008 (E8)	11	Cummins KTTA50-G2-V16	1,500 kW	liquid	0.120		0.003	0.008	0.003	**0.014**	0.001	0.003	0.003	**0.007**	0.007	0.005	0.001	**0.014**	0.002	0.000	0.003	**0.005**	**0.040**
CF-G-70375	12	Detroit Diesel 12V2000-R1237k35	600 kW	liquid	0.100		0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.001**	**0.002**
Incinerators																							
CF-K-59701	13	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.128	0.108	0.138	**0.374**	0.128	0.138	0.051	**0.317**	0.158	0.148	0.058	**0.363**	0.158	0.148	0.158	**0.463**	**1.517**
CF-K-59702	14	EnerWaste BOS 3.5T	292 lb/hr	gas/refuse			0.138	0.098	0.147	**0.383**	0.140	0.001	0.148	**0.288**	0.148	0.148	0.167	**0.463**	0.148	0.148	0.158	**0.453**	**1.587**
Flares																							
CF-X-35002	15	HP Flare	261 MMscfd	gas	20.0 µg/L		0.00	0.00	0.01	**0.01**	0.00	0.00	0.00	**0.01**	0.01	0.01	0.00	**0.02**	0.00	0.00	0.00	**0.01**	**0.05**
CF-X-35012	16	LP Flare	212 MMscfd	gas	20.0 µg/L		0.10	0.09	0.13	**0.32**	0.07	0.07	0.08	**0.22**	0.14	0.05	0.07	**0.27**	0.00	0.00	0.00	**0.01**	**0.81**
Portable Flares	17	Portable Flares	3.9 MMscfd	gas	20.0 µg/L		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**
Well Pad Heaters																							
CD2-H-30001	18	OPS Production Heater	20.0 MMBtu/hr	gas	0.007		0.01	0.01	0.01	**0.02**	0.01	0.01	0.00	**0.01**	0.00	0.00	0.01	**0.01**	0.01	0.01	0.01	**0.03**	**0.07**
CD3-U-303007-H1	19	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.007		0.01	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.03**	**0.12**
CD4-U-304007-H1	20	GTS Energy Production Heater	20.0 MMBtu/hr	gas	0.007		0.01	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.03**	0.01	0.01	0.01	**0.02**	0.01	0.01	0.01	**0.03**	**0.11**
Well Pad Engines																							
CD3-U-703001-G1	21	CD3 Standby Generator - CAT 3412E	600 kW	liquid	0.100		0.001	0.001	0.001	**0.003**	0.000	0.001	0.000	**0.001**	0.000	0.003	0.000	**0.004**	0.001	0.000	0.000	**0.001**	**0.009**
CD3-U-703201-G1	622	CD3 Standby Generator - CAT C27	800 kW	liquid		0.160	0.000	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	**0.002**
Doyon Drilling Rig 19 at CD1/CD2																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.021		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.310		0.000	0.000	0.000	**0.000**	0.012	0.005	0.000	**0.017**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.017**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.310		0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.023		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.023		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.128		0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.128		0.000	0.000	0.000	**0.000**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.008		0.000	0.000	0.000	**0.000**	0.001	0.005	0.000	**0.006**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.006**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.008		0.000	0.000	0.000	**0.000**	0.002	0.009	0.000	**0.011**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.011**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.008		0.000	0.000	0.000	**0.000**	0.001	0.005	0.000	**0.006**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.006**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.008		0.000	0.000	0.000	**0.000**	0.001	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.008		0.000	0.000	0.000	**0.000**	0.002	0.000	0.000	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
MP1	39	Mud Plant Boiler	1.30 MMBtu/hr	liquid	0.008		0.002	0.002	0.002	**0.007**	0.002	0.002	0.002	**0.006**	0.001	0.001	0.001	**0.004**	0.002	0.002	0.002	**0.006**	**0.022**
BP1	40	Detroit 6063-GK35 Power	300 kW	liquid	0.012		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
BP2	41	Detroit 6043-GK35 Power	160 kW	liquid	0.010		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

Emissions_Spreadsheet_Alpine_2014.5.xlsm
Alpine Significant Emission Units
Assessable Actual Emission-fees
ConocoPhillips Alaska, Inc.

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Monthly/Quarterly Actual Emissions
2014

Tag Number	Unit ID	Manufactuer / Model	Rating	Fuel Type	PM$_{10}$ EF	PM$_{10}$ EF	PM$_{10}$ Emission Rate (tons)																
					lb/MMBtu	lb/hr	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Doyon Drilling Rig 19 at CD3																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.001	**0.001**	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.021		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.050	0.001	0.000	0.001	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.310		0.000	0.000	0.000	**0.000**	0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.003**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.310		0.001	0.000	0.008	**0.009**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.009**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.023		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.023		0.005	0.000	0.000	**0.005**	0.003	0.000	0.000	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.008**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.128		0.000	0.002	0.001	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.004**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.128		0.000	0.002	0.001	**0.003**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.004**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.008		0.003	0.009	0.010	**0.021**	0.007	0.000	0.000	**0.007**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.028**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.008		0.003	0.009	0.010	**0.022**	0.008	0.000	0.000	**0.008**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.030**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.008		0.002	0.006	0.006	**0.013**	0.005	0.000	0.000	**0.005**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.018**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.008		0.003	0.008	0.008	**0.019**	0.006	0.000	0.000	**0.006**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.026**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.008		0.004	0.011	0.012	**0.028**	0.007	0.000	0.000	**0.007**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.035**
Doyon Drilling Rig 19 at CD4																							
Generator 2	22	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.001	0.001	**0.002**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.002**
Generator 5	23	Caterpillar 3512C Power	825 kW	liquid		0.050	0.001	0.000	0.000	**0.001**	0.000	0.001	0.001	**0.001**	0.000	0.001	0.000	**0.001**	0.000	0.001	0.000	**0.001**	**0.004**
Generator 1	24	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 0 (removed)	25	Caterpillar D399TA Power (removed)	976 kW	liquid	0.021		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Generator 3	26	Caterpillar 3512C Power	825 kW	liquid		0.050	0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.002	0.001	**0.003**	0.000	0.001	0.000	**0.001**	**0.004**
Generator 4	27	Caterpillar 3512C Power	825 kW	liquid		0.050	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**
Pits Move Engine		Caterpillar 3406 Rig Move Engine	376 hp	liquid	0.310		0.008	0.000	0.000	**0.008**	0.000	0.011	0.000	**0.011**	0.000	0.001	0.000	**0.001**	0.000	0.000	0.000	**0.000**	**0.020**
Pipe Shed Move Engine and Portable Move Engine		Caterpillar 3114 Rig Move Engine	105 hp	liquid	0.310		0.007	0.000	0.000	**0.007**	0.000	0.000	0.001	**0.001**	0.000	0.002	0.001	**0.003**	0.000	0.000	0.001	**0.002**	**0.013**
Camp Generator 1	30	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.023		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.001**
Camp Generator 2	31	Caterpillar D379TA Rig Camp Engine	379 kW	liquid	0.023		0.001	0.000	0.000	**0.001**	0.001	0.000	0.000	**0.001**	0.000	0.003	0.002	**0.005**	0.000	0.000	0.000	**0.000**	**0.007**
Cement Pump 1	32	Caterpillar 3176 Cement Pump	180 kW	liquid	0.128		0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.002	**0.002**	**0.005**
Cement Pump 2	33	Caterpillar 3176 Cement Pump	180 kW	liquid	0.128		0.001	0.000	0.000	**0.001**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.002	**0.002**	**0.005**
Boiler 1	34	Superior Boiler	100 hp	liquid	0.008		0.006	0.000	0.000	**0.006**	0.000	0.000	0.004	**0.004**	0.007	0.008	0.006	**0.021**	0.008	0.009	0.010	**0.027**	**0.058**
Boiler 2	35	Superior Boiler	100 hp	liquid	0.008		0.006	0.000	0.000	**0.006**	0.000	0.000	0.006	**0.006**	0.000	0.000	0.007	**0.007**	0.010	0.009	0.010	**0.029**	**0.048**
HEA-AIR-008 (Dicks Heater)	36	Dicks Heater	2.00 MMBtu/hr	liquid	0.008		0.004	0.000	0.000	**0.004**	0.000	0.000	0.002	**0.002**	0.001	0.003	0.005	**0.009**	0.006	0.006	0.006	**0.018**	**0.032**
HEA-AIR-006 (Dicks Heater)	37	Dicks Heater	3.00 MMBtu/hr	liquid	0.008		0.006	0.000	0.000	**0.006**	0.000	0.000	0.003	**0.004**	0.000	0.000	0.005	**0.005**	0.008	0.008	0.008	**0.023**	**0.039**
HEA-AIR-007 (Dicks Heater)	38	Dicks Heater	4.00 MMBtu/hr	liquid	0.008		0.008	0.000	0.000	**0.008**	0.000	0.000	0.001	**0.001**	0.000	0.000	0.000	**0.001**	0.000	0.009	0.012	**0.021**	**0.031**
Ball Mill Engine, Generic Well Servicing Equipment (Coil Tubing Unit) and Well Frac Unit																							
Ball Mill Engine		Cummins LTA-1061 Ball Mill Engine	230 kW	liquid	0.310		0.015	0.000	0.009	**0.023**	0.021	0.020	0.007	**0.048**	0.000	0.050	0.025	**0.076**	0.000	0.003	0.010	**0.013**	**0.159**
Well Service Heater	42	Various	10.0 MMBtu/hr	liquid	0.007		0.001	0.002	0.001	**0.003**	0.001	0.000	0.000	**0.002**	0.001	0.000	0.001	**0.002**	0.001	0.001	0.001	**0.002**	**0.009**
Well Service Engines	42	Various	Various	liquid	0.118		0.020	0.028	0.023	**0.071**	0.022	0.021	0.019	**0.061**	0.019	0.018	0.026	**0.062**	0.021	0.017	0.025	**0.062**	**0.257**
Well Frac Unit Engine	43	Various	Various	liquid	0.062		0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	0.000	0.000	0.000	**0.000**	**0.000**

	Jan	Feb	Mar	1Q	Apr	May	Jun	2Q	Jul	Aug	Sep	3Q	Oct	Nov	Dec	4Q	Total
Total	2.6	2.3	2.6	**7.6**	2.4	2.4	2.2	**7.0**	2.2	2.1	2.0	**6.3**	2.3	2.3	2.5	**7.1**	**28.0**
w/o NREs	2.5	2.3	2.6	**7.4**	2.4	2.3	2.2	**6.9**	2.1	2.0	2.0	**6.1**	2.3	2.3	2.4	**7.0**	**27.4**
w/o D19	2.5	2.3	2.6	**7.4**	2.4	2.3	2.2	**6.9**	2.2	2.1	2.0	**6.2**	2.3	2.3	2.4	**7.0**	**27.5**

Turbines MMBtu/hr is based on LHV
Heaters MMBtu/hr is based on LHV
All other souces MMBtu/hr are based on HHV

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Portable Equipment Inventory - Heaters PTE

Emission Unit ID	Emission Unit Description	Manufacturer	Model	Heat Input Rating	Fuel Type	Total MMBTUs	Estimated Fuel Use	Maximum Operation	Potential Emissions (tpy)				
									NO_X	CO	PM_{10}	SO_2	VOC
AM1001	Snowmelter Heater	NA	Snowmelter	4.21 MMBtu/hr	diesel	36,859 MMBtu/yr	280,320 gal/yr	8,760 hr/yr	2.8	0.70	0.151	0.0	0.048
AS4001	Steamer heater	Steam Flo	SF-20	0.79 MMBtu/hr	diesel	6,929 MMBtu/yr	52,697 gal/yr	8,760 hr/yr	0.5	0.13	0.028	0.0	0.009
AS4002	Steamer heater	Steam Flo	SF-20	0.79 MMBtu/hr	diesel	6,929 MMBtu/yr	52,697 gal/yr	8,760 hr/yr	0.5	0.13	0.028	0.0	0.009
AS5070	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS5071	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS5072	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS5073	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS5074	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS5078	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS5079	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6080	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6081	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6082	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6083	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6084	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6085	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6086	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6088	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6089	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6090	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6091	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6092	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6093	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6094	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6095	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6096	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS6097	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS7105	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS7106	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS7107	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS7108	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AS7109	Heater	TIOGA	IDF3KSCO	0.65 MMBtu/hr	diesel	5,694 MMBtu/yr	43,304 gal/yr	8,760 hr/yr	0.4	0.11	0.023	0.0	0.007
AHU-64058	NG Heater (Not Portable)	TIOGA	IDF2.2BG	0.63 MMBtu/hr	NG	5,475 MMBtu/yr	3.96 mmscf/yr	8,760 hr/yr	0.22	0.18	0.017	0.0117	0.012
AHU-69632	NG Heater (Not Portable)	DES	ADFB318-11-1200	1.50 MMBtu/hr	NG	13,140 MMBtu/yr	9.5 mmscf/yr	8,760 hr/yr	0.52	0.44	0.040	0.028	0.029
AHU-69633A	NG Heater (Not Portable)	MODINE	PDP250	0.25 MMBtu/hr	NG	2,190 MMBtu/yr	1.6 mmscf/yr	8,760 hr/yr	0.08	0.03	0.007	0.00	0.005
AHU-69633B	NG Heater (Not Portable)	MODINE	PDP250	0.25 MMBtu/hr	NG	2,190 MMBtu/yr	1.6 mmscf/yr	8,760 hr/yr	0.08	0.03	0.007	0.005	0.005
AHU-69633C	NG Heater (Not Portable)	MODINE	PDP250	0.25 MMBtu/hr	NG	2,190 MMBtu/yr	1.6 mmscf/yr	8,760 hr/yr	0.08	0.03	0.007	0.005	0.005
AHU-69633D	NG Heater (Not Portable)	MODINE	PDP250	0.25 MMBtu/hr	NG	2,190 MMBtu/yr	1.6 mmscf/yr	8,760 hr/yr	0.08	0.03	0.007	0.005	0.005
CF-AHU-69015	NG Heater (Not Portable)	MODINE	PSH340SV0130	0.34 MMBtu/hr	NG	3,016 MMBtu/yr	2.2 mmscf/yr	8,760 hr/yr	0.12	0.10	0.009	0.006	0.007
CF-AHU-69016	NG Heater (Not Portable)	MODINE	PSH340SV0130	0.34 MMBtu/hr	NG	3,016 MMBtu/yr	2.2 mmscf/yr	8,760 hr/yr	0.12	0.10	0.009	0.006	0.007
CF-AHU-69017	NG Heater (Not Portable)	MODINE	PSH340SV0130	0.34 MMBtu/hr	NG	3,016 MMBtu/yr	2.2 mmscf/yr	8,760 hr/yr	0.12	0.10	0.009	0.006	0.007
CF-AHU-69637A	NG Heater (Not Portable)	RAY	HL2-40-75N	0.09 MMBtu/hr	NG	821 MMBtu/yr	0.6 mmscf/yr	8,760 hr/yr	0.03	0.01	0.002	0.002	0.002
CF-AHU-69637B	NG Heater (Not Portable)	RAY	HL2-40-75N	0.09 MMBtu/hr	NG	821 MMBtu/yr	0.6 mmscf/yr	8,760 hr/yr	0.03	0.01	0.002	0.0017	0.002

ConocoPhillips Alaska, Inc. - Alpine Central Processing Facility
Portable Equipment Inventory - Heaters PTE

Emission Unit ID	Emission Unit Description	Manufacturer	Model	Heat Input Rating	Fuel Type	Total MMBTUs	Estimated Fuel Use	Maximum Operation	Potential Emissions (tpy) NO_x	CO	PM_{10}	SO_2	VOC
CF-AHU-69637C	NG Heater (Not Portable)	RAY	HL2-40-75N	0.09 MMBtu/hr	NG	821 MMBtu/yr	0.6 mmscf/yr	8,760 hr/yr	0.03	0.01	0.002	0.0017	0.002
CF-AHU-69637D	NG Heater (Not Portable)	RAY	HL2-40-75N	0.09 MMBtu/hr	NG	821 MMBtu/yr	0.6 mmscf/yr	8,760 hr/yr	0.03	0.01	0.002	0.0017	0.002
CF-AHU-69640	NG Heater (Not Portable)	Green Heck	PVF300H	0.75 MMBtu/hr	NG	6,570 MMBtu/yr	4.7 mmscf/yr	8,760 hr/yr	0.26	0.22	0.020	0.0140	0.014
CF-AHU-69895	NG Heater (Not Portable)	MODINE	HDS75	0.08 MMBtu/hr	NG	657 MMBtu/yr	0.5 mmscf/yr	8,760 hr/yr	0.02	0.01	0.002	0.0014	0.001
CF-AHU-69951	NG Heater (Not Portable)	REZNOR	SSCBL800	0.50 MMBtu/hr	NG	4,380 MMBtu/yr	3.2 mmscf/yr	8,760 hr/yr	0.17	0.15	0.013	0.009	0.010
CF-AHU-69952	NG Heater (Not Portable)	REZNOR	SCE200-6	0.25 MMBtu/hr	NG	2,190 MMBtu/yr	1.6 mmscf/yr	8,760 hr/yr	0.08	0.03	0.007	0.005	0.005
CP-AHU-76001	HDD Propane Heater (Not portable)	STERLING RAD	UF30	0.04 MMBtu/hr	NG	329 MMBtu/yr	0.2 mmscf/yr	8,760 hr/yr	0.01	0.01	0.001	0.001	0.001
H-69377A	NG Heater (Not Portable)	MODINE	PV250	0.13 MMBtu/hr	NG	1,095 MMBtu/yr	0.8 mmscf/yr	8,760 hr/yr	0.04	0.02	0.003	0.00	0.002
H-69377B	NG Heater (Not Portable)	MODINE	PV250	0.13 MMBtu/hr	NG	1,095 MMBtu/yr	0.8 mmscf/yr	8,760 hr/yr	0.04	0.02	0.003	0.00	0.002
H-69377C	NG Heater (Not Portable)	MODINE	PV250	0.13 MMBtu/hr	NG	1,095 MMBtu/yr	0.8 mmscf/yr	8,760 hr/yr	0.04	0.02	0.003	0.00	0.002
H-69377D	NG Heater (Not Portable)	MODINE	PV250	0.13 MMBtu/hr	NG	1,095 MMBtu/yr	0.8 mmscf/yr	8,760 hr/yr	0.04	0.02	0.003	0.00	0.002
H-69378A	NG Heater (Not Portable)	MODINE	PV145	0.15 MMBtu/hr	NG	1,270 MMBtu/yr	0.9 mmscf/yr	8,760 hr/yr	0.05	0.02	0.004	0.00	0.003
H-69378B	NG Heater (Not Portable)	MODINE	PV145	0.15 MMBtu/hr	NG	1,270 MMBtu/yr	0.9 mmscf/yr	8,760 hr/yr	0.05	0.02	0.004	0.00	0.003
H-69378C	NG Heater (Not Portable)	MODINE	PV145	0.15 MMBtu/hr	NG	1,270 MMBtu/yr	0.9 mmscf/yr	8,760 hr/yr	0.05	0.02	0.004	0.00	0.003
UH-69963	NG Heater (Not Portable)	REZNOR	UDAS 125	1.50 MMBtu/hr	NG	13,140 MMBtu/yr	9.5 mmscf/yr	8,760 hr/yr	0.52	0.44	0.040	0.03	0.029
UH-69964	NG Heater (Not Portable)	REZNOR	UDAS 125	1.50 MMBtu/hr	NG	13,140 MMBtu/yr	9.5 mmscf/yr	8,760 hr/yr	0.52	0.44	0.040	0.03	0.029
UH-69966	NG Heater (Not Portable)	REZNOR	UDAS 125	0.13 MMBtu/hr	NG	1,095 MMBtu/yr	0.8 mmscf/yr	8,760 hr/yr	0.04	0.02	0.003	0.00	0.002
					TOTAL MMBTU/YEAR	**305,242 MMBtu/yr**		**TOTAL EMISSIONS**	**19.9**	**6.7**	**1.2**	**0.2**	**0.5**

Total = 24.6 MMBtu/hr liquid fuel fired
Total = 10.21 MMBtu/hr fuel gas fired

Notes on Emission Calculation Methodology:

1. Diesel Sulfur Content **0.0003** wt%
2. Diesel Heating Value **131,490** Btu/gal (approximate)
3. Diesel Fuel Density **6.743** lb/gal (approximate)
4. Natural Gas HHV **1,384** Btu/scf (approximate)
5. Natural Gas LHV **1,259** Btu/scf (approximate)
6. Natural Gas H_2S Content **35.0** ppmv
7. Natural Gas Heater Efficiency **80%** Efficiency %
8. Emissions calculated based on mass balance (SO_2) and factors from AP-42, Tables 1.4-1, 1.4-2, 1.3-1, 1.3-2, 1.3-3, 1.3-7, 1.3-8, and 1.3-9
9. "Maximum operation" is conservatively assumed to be 8,760 hours in a calendar year.

Fuel Type/Rating	Emission Factors ($lb/10^3gal$) NOx	CO	PM10	SO2	VOC
Diesel (>0.3 and <100 MMBtu/hr)	**20**	**5**	**1.08**	**0.0**	**0.34**
Diesel (<0.3 MMBtu/hr)	**18**	**5**	**0.4**	**0.0**	**0.71**

Fuel Type/Rating	Emission Factors (lb/MMscf) NOx	CO	PM10	SO2	VOC
Gas (>0.3 and <100 MMBtu/hr)	**100**	**84**	**7.6**	**5.9**	**5.5**
Gas (<0.3 MMBtu/hr)	**94**	**40**	**7.6**	**5.9**	**5.5**

Other Notes

10. Heater fan engines are housed together in a single chassis with the portable heaters. The engine portion is listed on the "Portable_Engines" tab. The heater portion of the unit is listed here.

ConocoPhillips Alaska, Inc. - Alpine Oilfield
2014 Well Flowbacks
Source: PowerWell Services Reports when well is flowed to tanks

Well Name	Date	Duration	Cum Liquid STB	Cum Gas MSCF	Comments
CD4-290	2/5/2014	246.00 hrs	216.89	34.0	New well; live crude to tanks; vented to atmosphere
		Totals =	216.9	**34.0**	

Alpine Oil w/Alpine EOS --> No Head (14.7 psia) & 60 F
Single Flash

Component	MW	Volume (%)	Volume (Mscf)	Mass (tons)	Mass (tonnes)	Mass (tonnes)		
CO2	44.0	0.5248	0.2	0.01	**0.01**	**0.02**	⟵ **CO2**	
N2	28.0	0.445	0.2	0.006	0.005	0.001		
C1	16.0	63.4	22	0.5	**0.4**	**0.3**	⟵ **Methane**	
C2	30.1	10.5	4	0.1	0.1	0.3		
C3	44.1	13.2	4	**0.3**	**0.2**	**0.5**		**VOC total (tonnes)**
C4	58.1	7.06	2	**0.2**	**0.2**	**0.2**		**0.7**
C5	72.2	2.88	1	**0.1**	**0.1**	**0.0**		
C6	86.2	1.19	0.4	**0.05**	**0.04**	**0.01**		**VOC total (tons)**
C7-C8	107.0	0.795	0.3	**0.04**	**0.03**	**0.01**		**0.8**
C9+	133.2	0.0	0.007	**0.001**	**0.001**			
Benzene						**0.000**	⟵ **Benzene**	
		100	**34**	1.2	1.1	1.3		

Example Calculation:
ton CO_2 = Cum Gas Mscf * (0.5248%/100) * (1000 scf/Mscf) * (1/379 scf/lb-mol) * (44.0 lb CO_2/lb-mol CO_2) * (ton/2000 lb) = tons CO_2

HYDROCARBON LIQUID STORAGE TANK EMISSION INVENTORY
CONOCOPHILLIPS ALASKA, INC. - ALPINE CENTRAL PROCESSING FACILITY

Tanks Inventory Updated October 2011

Tank Identification															
Source	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**
Tank Tag No.	**CF-T-31010**[1, 2]	**CD3-T-383003**[2]	**CD3-T-553003**[2, 3]	**CF-T-61001**[6]	**CD3-T-613012**	**CF-T-50061A**	**CF-T-50061B**	**CF-T-50063A**	**CF-T-50063B**	**E-98-034-S2**	**CF-T-50090**	**CF-T-50011**	**CD3-T-503009**	**CD3-T-513006**	**CD2-T-50170**
Type of Tank	VFRT/SOT	VFRT/OW	VFRT/PWT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT
Content Used in Tanks 4.09d	ANS Crude	ANS Crude	ANS Crude	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	EG	Water	MeOH	MeOH	MeOH	MeOH
VR or other Control	CVS	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	115 F	Ambient	50 F	85 F	65 F	Ambient	Ambient	Ambient	Ambient	40 F	70 F	60 F	40 F	40 F	40 F
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions															
Shell Height (ft)	24	22	22	32	18	20	20	20	20	20	31.5	20	22	22	24
Diameter (ft)	21.5	12	12	27.5	10	12	12	12	12	12	13.5	12	12	12	15.5
Max. Liquid Height (ft)	23	21	21	31	17	19	19	19	19	19	30	19	21	21	23
Avg. Liquid Height (ft)	12	12	12	20	10	10	10	10	10	10	15	10	11	11	12
Avg. D Liq. Level (ft)															
Nameplate Volume (gallons)	63,000	18,186	18,606	138,600	10,584	16,800	16,800	16,800	16,800	16,800	33,726	16,800	18,606	18,606	31,500
Design Capacity (gallons)	65,179	18,613	18,613	142,180	10,575	16,921	16,921	16,921	16,921	16,921	33,729	16,921	18,613	18,613	33,876
Working Volume (gallons)	62,464	17,767	17,767	137,736	9,988	16,075	16,075	16,075	16,075	16,075	32,123	16,075	17,767	17,767	32,465
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12	12	12	90	12	12	12	12	12	12	12	12	12	12	12
Paint Characteristics															
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics															
Type	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)															
Radius (ft) [Dome Roof]															
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings															
Vacuum Setting (in.WC)															
Pressure Setting (in.WC)												10	10		
TANKS 4.09 Results (Annual VOC Emissions)															
Annual Breathing Loss (lb) (PTE)	0.00	257.29	0.00	0.00	0.00	1.25	1.25	1.25	1.25	0.00	0.00	0.00	0.00	0.00	0.00
Annual Working Loss (lb) (PTE)	0.00	320.38	697.50	775.92	6.54	2.09	2.09	2.09	2.09	0.07	0.00	268.05	268.05	268.05	345.93
Total Loss (ton/yr) (PTE)	**0.000**	**0.289**	**0.349**	**0.388**	**0.003**	**0.002**	**0.002**	**0.002**	**0.002**	**0.000**	**0.000**	**0.134**	**0.134**	**0.134**	**0.173**
Total Loss (ton/yr) (est. actual)	**0.000**	**0.289**	**0.349**	**0.374**	**0.003**	**0.002**	**0.002**	**0.002**	**0.002**	**0.000**	**0.000**	**0.134**	**0.134**	**0.134**	**0.173**

SOURCE TOTAL (PTE)	**3.73 ton/yr**	(does not include temporary tanks)
SOURCE TOTAL (est. actual)	**3.71 ton/yr**	(does not include temporary tanks)

Notes

There are no breathing losses from heated tanks

Water and sanitary wastewater have no VOC emissions

- Lube oil tanks are categorically insignficant under 18 AAC 50.326(f)(82).
- Emissions from tanks containing diesel, EG, TEG, MeOH, ANS crude and several other fluids were estimated using "generic" emissions data generated by EPA's Tanks 4.09.d. In each case, a tank with the same fluid, a similar or larger size and similar or larger throughput were used.
- Gasoline storage tanks are typically filled once per year or less. Emissions from these tanks are based on 1 turnover per year.

[1] There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

[2] Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

[3] The PWT at Alpine operates as a storage tank (not a flow-through tank). Fluids are periodically pumped to this tank where they accumulate for up to a year until they can be removed by vac truck and taken to the main ALP facility for processing/disposal. While actual turnover is usually 1/year, emissions are conservatively estimated based on 1 TO/month.

[4] Mineral Oil does not have an appreciable VOC content (NA per MSDS); therefore, emissions are zero.

[5] The skid-mounted storage tank typically remains empty on an annual basis. It is used at remote sites if gasoline is needed for an "event".

[6] Potential emissions from tank CF-T-61001 are set based on an estimated 100 turnovers per year. This is not necessarily a fixed value and may be changed in the future.

HYDROCARBON LIQUID STORAGE TANK EMISSION INVENTORY
CONOCOPHILLIPS ALASKA, INC. - ALPINE CENTRAL PROCESSING FACILITY

Tanks Inventory Updated October 2011

Tank Identification															
Source	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**	**Alpine**
Tank Tag No.	**CF-T-50120**	**CF-T-50122**	**CF-T-50217**	**CF-T-50218**	**CF-T-50222**	**CF-T-50223**	**CF-T-51001** [1]	**E-98-272-5** [4]	**CF-T-50001**	**E-02-034-S1**	**E-98-272-6**	**E-98-034-S1**	**CF-T-52001**	**CD2-T-50011**	**CF-T-50031**
Type of Tank	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT	VFRT
Content Used in Tanks 4.09d	MeOH	MeOH	MeOH	MeOH	EG	EG	MeOH	Mineral Oil	Naphtha	Naphtha	Naphtha	Non-VOL	TEG	Water	Water
VR or other Control	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	CVS	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	45 F	40 F	40-50F	40-50F	40-50F	40-50F	10 F	40-50F	50 F	40-50F	40-50F	40 F	60 F	60 F	NA
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions															
Shell Height (ft)	35.8	35.8	20	20	35.8	35.8	24	30	24	30	30	20	15	15	15
Diameter (ft)	13	13	12	12	13	13	21.5	12	15.5	12	12	12	11	11	11
Max. Liquid Height (ft)	34	34	19	19	34	34	23	29	23	29	29	19	14	14	14
Avg. Liquid Height (ft)	20	20	10	10	20	20	12	15	12	15	15	10	8	8	8
Avg. D Liq. Level (ft)															
Nameplate Volume (gallons)	33,759	33,768	33,768	33,768	31,500	31,500	63,000	25,200	31,500	25,200	25,200	16,800	10,500	10,500	10,500
Design Capacity (gallons)	35,579	35,579	16,921	16,921	35,579	35,579	65,179	25,381	33,876	25,381	25,381	16,921	10,663	10,663	10,663
Working Volume (gallons)	33,759	33,759	16,075	16,075	33,759	33,759	62,464	24,535	32,465	24,535	24,535	16,075	9,953	9,953	9,953
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Paint Characteristics															
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Roof Characteristics															
Type	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome	Dome
Height (ft)															
Radius (ft) [Dome Roof]															
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Breather Vent Settings															
Vacuum Setting (in.WC)															
Pressure Setting (in.WC)															
TANKS 4.09 Results (Annual VOC Emissions)															
Annual Breathing Loss (lb) (PTE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual Working Loss (lb) (PTE)	345.93	345.93	345.93	345.93	0.35	0.35	0.00	0.00	825.08	825.08	825.08	0.00	3.85	0.00	0.00
Total Loss (ton/yr) (PTE)	**0.173**	**0.173**	**0.173**	**0.173**	**0.000**	**0.000**	**0.000**	**0.000**	**0.413**	**0.413**	**0.413**	**0.000**	**0.002**	**0.000**	**0.000**
Total Loss (ton/yr) (est. actual)	**0.173**	**0.173**	**0.173**	**0.173**	**0.000**	**0.000**	**0.000**	**0.000**	**0.413**	**0.413**	**0.413**	**0.000**	**0.002**	**0.000**	**0.000**
SOURCE TOTAL (PTE)															
SOURCE TOTAL (est. actual)															

Notes

There are no breathing losses from heated tanks

Water and sanitary wastewater have no VOC emissions

- Lube oil tanks are categorically insignficant under 18 AAC 50.326(f)(82).
- Emissions from tanks containing diesel, EG, TEG, MeOH, ANS crude and several other fluids were estimated using "generic" emissions data generated by EPA's Tanks 4.09.d. In each case, a tank with the same fluid, a similar or larger size and similar or larger throughput were used.
- Gasoline storage tanks are typically filled once per year or less. Emissions from these tanks are based on 1 turnover per year.

[1] There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

[2] Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

[3] The PWT at Alpine operates as a storage tank (not a flow-through tank). Fluids are periodically pumped to this tank where they accumulate for up to a year until they can be removed by vac truck and taken to the main ALP facility for processing/disposal. While actual turnover is usually 1/year, emissions are conservatively estimated based on 1 TO/month.

[4] Mineral Oil does not have an appreciable VOC content (NA per MSDS); therefore, emissions are zero.

[5] The skid-mounted storage tank typically remains empty on an annual basis. It is used at remote sites if gasoline is needed for an "event".

[6] Potential emissions from tank CF-T-61001 are set based on an estimated 100 turnovers per year. This is not necessarily a fixed value and may be changed in the future.

HYDROCARBON LIQUID STORAGE TANK EMISSION INVENTORY
CONOCOPHILLIPS ALASKA, INC. - ALPINE CENTRAL PROCESSING FACILITY

Tanks Inventory Updated October 2011

Tank Identification						
Source	**CD1**	**CD1/CD3**	**CD1/CD3**	**Mobile**	**Doyon 19**	**Doyon 19**
Tank Tag No.	**CF-T-76072**	**TKFA-0501-25**	**AP-T-76222**	**TKFA-0201-25** [5]	**D19-19-001**	**D19-CDT**
Type of Tank	Horiz	Horiz	Horiz	Horiz	Horiz - RCT	Horiz
Content Used in Tanks 4.09d	Gasoline	Gasoline	Gasoline	Gasoline	Diesel	Diesel
VR or other Control	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled	Uncontrolled
Tank Temperature (F)	Ambient	Ambient	Ambient	NA	Ambient	Ambient
Operational Status	Operating	Operating	Operating	Operating	Operating	Operating
Tank Dimensions						
Shell Height (ft)	14	6	6	4	22.3	26
Diameter (ft)	7.9	4	4	2.76	10.75	7.14
Max. Liquid Height (ft)	7	3	3	2	10	6
Avg. Liquid Height (ft)	5	2.5	2.5	1.5	7	5
Avg. D Liq. Level (ft)						
Nameplate Volume (gallons)	5,000	500	500	200	14,700	5,700
Design Capacity (gallons)	5,133	564	564	179	15,141	7,787
Working Volume (gallons)	4,030	317	317	94	13,102	5,499
Net Throughput (gal/yr)	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers	Use Turnovers
Turnovers per year	1	1	1	1	12	12
Paint Characteristics						
Shell Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Shell Condition	Good	Good	Good	Good	Good	Good
Roof Color/Shade	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium	gray/medium
Roof Condition	Good	Good	Good	Good	Good	Good
Roof Characteristics						
Type	NA	NA	NA	NA	NA	NA
Height (ft)						
Radius (ft) [Dome Roof]						
Slope (ft/ft) [Cone Roof]	N/A	N/A	N/A	N/A		
Breather Vent Settings						
Vacuum Setting (in.WC)						
Pressure Setting (in.WC)						
TANKS 4.09 Results (Annual VOC Emissions)						
Annual Breathing Loss (lb) (PTE)	209.04	26.84	26.84	13.15	0.98	0.85
Annual Working Loss (lb) (PTE)	15.51	1.55	1.55	0.62	1.25	0.83
Total Loss (ton/yr) (PTE)	**0.112**	**0.014**	**0.014**	**0.007**	**0.001 ton/yr**	**0.001 ton/yr**
Total Loss (ton/yr) (est. actual)	**0.112**	**0.014**	**0.014**	**0.007**	**0.001**	**0.001**
SOURCE TOTAL (PTE)						
SOURCE TOTAL (est. actual)						

CPAI
Alpine Gasoline Fuel Tanks (Estimate for all four tanks)

Vehicle Refueling Losses (AP-42 Table 5.2-7)

Emission Source	**Emission Factor (lb VOC/1000 gal throughput)**	**x**	**Thruput (gal/yr)**	**=**	**Emissions VOC (lb/yr)**	**Emissions VOC (tpy)**
Displacement losses (uncontrolled)	11.0	x	6200	=	68.2	0.034
Spillage	0.7	x	6200	=	4.3	0.002

Notes

There are no breathing losses from heated tanks

Water and sanitary wastewater have no VOC emissions

- Lube oil tanks are categorically insignficant under 18 AAC 50.326(f)(82).
- Emissions from tanks containing diesel, EG, TEG, MeOH, ANS crude and several other fluids were estimated using "generic" emissions data generated by EPA's Tanks 4.09.d. In each case, a tank with the same fluid, a similar or larger size and similar or larger throughput were used.
- Gasoline storage tanks are typically filled once per year or less. Emissions from these tanks are based on 1 turnover per year.

[1] There are no VOC emissions from this tank because the tank is equipped with a vapor recovery system as part of the design of the tank

[2] Per the Tanks 4.09.d Manual, tanks containing two-phase materials use the properties (Pva, Mv, etc.) of the top phase to estimate emissions. Calculate throughput using the overall liquid.

[3] The PWT at Alpine operates as a storage tank (not a flow-through tank). Fluids are periodically pumped to this tank where they accumulate for up to a year until they can be removed by vac truck and taken to the main ALP facility for processing/disposal. While actual turnover is usually 1/year, emissions are conservatively estimated based on 1 TO/month.

[4] Mineral Oil does not have an appreciable VOC content (NA per MSDS); therefore, emissions are zero.

[5] The skid-mounted storage tank typically remains empty on an annual basis. It is used at remote sites if gasoline is needed for an "event".

[6] Potential emissions from tank CF-T-61001 are set based on an estimated 100 turnovers per year. This is not necessarily a fixed value and may be changed in the future.

Attachment No. 4

Alpine Transportable Drilling Rigs

ConocoPhillips Alaska, Inc.
Alpine Transportable Drilling Rigs
Total Actual Emissions Summary

Rolling 12-Month Period Ending
December 2014

Pollutant	Emission Factor (pounds/gallon)	Fuel Use Rolling 12-Month Total (gallons)	Emissions Rolling 12-Month Total (tons)
CO	0.093	796,318	36.9
NOx	0.373		148.6
PM10	0.02355		9.4
SO2	0.00003		0.0
VOC	0.0239		9.5
		Sum Total =	**185**

Notes:

1. From ALP TDR Title V Application 3/2009.
   Emission factors for pollutants not addressed in the application have been developed using an equivalent methodology.

2. SO2 emissions are calculated using the maximum measured fuel sulfur content during the reporting perio **0.0003** weight percent.

Attachment No. 5

Tyonek Platform

2014 Assessable Emissions Estimate
Permit No. AQ0091TVP02
Tyonek Platform

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_X			
								Actual Emissions	
ID	Emission Unit Name/ Description	Design Capacity	Fuel Type	Actual Throughput or Usage	Calculated Throughput (NG Fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	Solar Centaur T-4700 Turbine #1	47.7 MMBtu/hr	NG	320.8 MMscf	9,084,660 scm	0.721 lb/MMBtu (LHV)	Source Test (7-Mar-2010)	95.37	105.13
2	Solar Centaur T-4700 Turbine #2	47.7 MMBtu/hr							
3	Solar Taurus 60 T-7300S Turbine #3	65.5 MMBtu/hr	NG	284.8 MMscf	8,065,814 scm	0.087 lb/MMBtu (LHV)	Source Test (13-Mar-2010)	10.22	11.26
4	Solar Taurus 60 T-7300S Turbine #4	65.5 MMBtu/hr	NG	190.2 MMscf	5,384,478 scm	0.087 lb/MMBtu (LHV)	Source Test (13-Mar-2010)	6.82	7.52
8	Waukesha L-7042G Engine #1	604 kW	NG	35.4 MMscf	1,001,855 scm	0.126 lb/MMBtu (LHV)	Source Test (10-Mar-2010)	1.84	2.03
9	Waukesha L-7042G Engine #4	604 kW	NG	34.0 MMscf	963,344 scm	0.108 lb/MMBtu (LHV)	Source Test (10-Mar-2010)	1.51	1.67
10	Black Sivalls Glycol Heater #1	11.1 MMBtu/hr	NG	22.0 MMscf	622,124 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.00	1.10
12	Black Sivalls Glycol Heater #3	11.1 MMBtu/hr							
20	Caterpillar D-398 Engine #1	795 hp	Diesel	4,094.0 gal	N/A	0.45 lb/gal	Permit Table C (Based on AP-42 Table 3.4-1 (10/96))	0.85	0.94
21	Caterpillar D-398 Engine #2	795 hp	Diesel	5,509.0 gal	N/A	0.45 lb/gal	Permit Table C (Based on AP-42 Table 3.4-1 (10/96))	1.13	1.25
24	Caterpillar C9.3 Crane Engine	350 hp	Diesel	1,468.9 gal	N/A	0.62 lb/gal	Vendor Data	0.47	0.52
25	Caterpillar C13 Crane Engine	440 hp	Diesel	2,174.1 gal	N/A	0.62 lb/gal	Vendor Data	0.69	0.76
28	John Deere 4039 Compressor Engine	80 hp	Diesel	79.6 gal	N/A	0.58 lb/gal	Permit Table C (Based on AP-42 Table 3.3-1 (10/96)	0.02	0.02
33	Caterpillar 3306 Firewater Engine #1	231 hp	Diesel	227.8 gal	N/A	0.51 lb/gal	Vendor Data	0.04	0.04
34	Caterpillar 3306 Firewater Engine #2	231 hp	Diesel	570.8 gal	N/A	0.51 lb/gal	Vendor Data	0.13	0.14
37	HP & LP Flare Pilot - routine	0.125 MMBtu/hr	NG	17.4 MMscf	491,866 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.54	0.59
38	HP Safety Flare - routine	583.3 MMBtu/hr	NG	4.7 MMscf	133,656 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.15	0.16
39	LP Safety Flare - routine	53.3 MMBtu/hr	NG	15.8 MMscf	447,692 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.49	0.54
N/A	Glycol Regenerator #1	0.275 MMBtu/hr	NG	41.89 MMscf	1,186,199 scm	94 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.79	1.97
N/A	Glycol Regenerator #2	0.275 MMBtu/hr							
N/A	Glycol Regenerator #3	0.275 MMBtu/hr							
40	Glycol Regen No. 1 Vent	2020 scfh	N/A	7,755.0 hours	N/A				
41	Glycol Regen No. 2 Vent	2020 scfh	N/A	6,457.0 hours	N/A				
42	Glycol Regen No. 3 Vent	2020 scfh	N/A	3,197.0 hours	N/A				
N/A	HP Safety Flare - nonroutine	583.3 MMBtu/hr	NG	0.1 MMscf	2,852 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.00	0.00
N/A	Rig Boiler(s) - nonroutine	Varies MMBtu/hr	Diesel	0.0 gal	N/A	20 lb/1000 gal	AP-42 Table 1.3-1 (09/98)	0.00	0.00
N/A	NREs < 600 hp - nonroutine	Varies hp	Diesel	54,890 gal	N/A	0.031 lb/hp-hr	AP-42 Table 3.3-1 (10/96)	14.55	16.04
N/A	NREs > 600 hp - nonroutine	Varies hp	Diesel	0.0 gal	N/A	0.024 lb/hp-hr	AP-42 Table 3.4-1 (10/96)	0.00	0.00
N/A	Enerco HeatStar HS125KT Heater	0.125 MMBtu/hr	Kerosene	0.0 gal	N/A	20 lb/1000 gal	AP-42 Table 1.3-1 (5/10)	0.00	0.00
							Total Nonroutine Emissions	14.56	16.05
							Total Emissions	138	152
							Total Assesable Emissions (excludes NREs)		136

Fuel	HHV	LHV	Sulfur Content	Density
NG	1005 Btu/scf	909 Btu/scf	2.5 ppmv H_2S	----
Diesel	131,990 Btu/gal	---	0.00072 wt% S	6.7 lb/gal
Kerosene	135,000 Btu/gal	---	0.05 wt% S	6.88 lb/gal

Note: NO_x emissions from EU IDs 20, 21, 24, 25, 28, 33, and 34 were estimated per Conditions 12.3 or 12.6a in Permit No. AQ0091TVP02.

2014 Assessable Emissions Estimate
Permit No. AQ0091TVP02
Tyonek Platform

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	Solar Centaur T-4700 Turbine #1	0.050 lb/MMBtu (LHV)	Source Test (7-Mar-2010)	6.61	7.29	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.95	1.05
2	Solar Centaur T-4700 Turbine #2								
3	Solar Taurus 60 T-7300S Turbine #3	0.148 lb/MMBtu (LHV)	Source Test (15-Mar-2010)	17.38	19.16	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.84	0.93
4	Solar Taurus 60 T-7300S Turbine #4	0.148 lb/MMBtu (LHV)	Source Test (15-Mar-2010)	11.60	12.79	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.56	0.62
8	Waukesha L-7042G Engine #1	0.23 lb/MMBtu (LHV)	Source Test (16-Dec-2014)	3.38	3.72	0.0194 lb/MMBtu	AP-42 Table 3.2-3 (7/00)	0.31	0.35
9	Waukesha L-7042G Engine #4	0.23 lb/MMBtu (LHV)	Source Test (16-Dec-2014)	3.25	3.58	0.0194 lb/MMBtu	AP-42 Table 3.2-3 (7/00)	0.30	0.33
10	Black Sivalls Glycol Heater #1	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.84	0.92	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.08	0.08
12	Black Sivalls Glycol Heater #3								
20	Caterpillar D-398 Engine #1	2.67 lb/hr	Vendor Data	0.34	0.37	0.124 lb/hr	Vendor Data	0.02	0.02
21	Caterpillar D-398 Engine #2	2.67 lb/hr	Vendor Data	0.44	0.49	0.124 lb/hr	Vendor Data	0.02	0.02
24	Caterpillar C9.3 Crane Engine	0.004 lb/gal	Vendor Data	0.00	0.00	0.0002 lb/gal	Vendor Data	0.00	0.00
25	Caterpillar C13 Crane Engine	0.005 lb/gal	Vendor Data	0.00	0.01	0.00002 lb/gal	Vendor Data	0.00	0.00
28	John Deere 4039 Compressor Engine	0.485 lb/hr	Vendor Data	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.00	0.00
33	Caterpillar 3306 Firewater Engine #1	1.05 lb/hr	Vendor Data	0.01	0.01	0.254 lb/hr	Vendor Data	0.00	0.00
34	Caterpillar 3306 Firewater Engine #2	1.05 lb/hr	Vendor Data	0.03	0.03	0.254 lb/hr	Vendor Data	0.01	0.01
37	HP & LP Flare Pilot - routine	0.37 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	2.93	3.23	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.21	0.23
38	HP Safety Flare - routine	0.37 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.80	0.88	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.06	0.06
39	LP Safety Flare - routine	0.37 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	2.67	2.94	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.19	0.21
N/A	Glycol Regenerator #1	40 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.76	0.84	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.14	0.16
N/A	Glycol Regenerator #2								
N/A	Glycol Regenerator #3								
40	Glycol Regen No. 1 Vent								
41	Glycol Regen No. 2 Vent								
42	Glycol Regen No. 3 Vent								
N/A	HP Safety Flare - nonroutine	0.37 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.02	0.02	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.00	0.00
N/A	Rig Boiler(s) - nonroutine	5 lb/1000 gal	AP-42 Table 1.3-1 (09/98)	0.00	0.00	2 lb/1000 gal	AP-42 Table 1.3-1 (09/98)	0.00	0.00
N/A	NREs < 600 hp - nonroutine	0.00668 lb/hp-hr	AP-42 Table 3.3-1 (10/96)	3.14	3.46	0.0022 lb/hp-hr	AP-42 Table 3.3-1 (10/96)	1.03	1.14
N/A	NREs > 600 hp - nonroutine	0.0055 lb/hp-hr	AP-42 Table 3.4-1 (10/96)	0.00	0.00	0.0573 lb/MMBTU	AP-42 Table 3.4-2 (10/96)	0.00	0.00
N/A	Enerco HeatStar HS125KT Heater	5 lb/1000 gal	AP-42 Table 1.3-1 (5/10)	0.00	0.00	3.3 lb/1000 gal	AP-42 Table 1.3-1/1.3-2 (05/10)	0.00	0.00
			Total Nonroutine Emissions	3.15	3.48		Total Nonroutine Emissions	1.03	1.14
			Total Emissions	54	60		Total Emissions	5	5
			Total Assesable Emissions (excludes NREs)		56		Total Assesable Emissions (excludes NREs)		0

2014 Assessable Emissions Estimate
Permit No. AQ0091TVP02
Tyonek Platform

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	Solar Centaur T-4700 Turbine #1	0.013 lb/MMBtu	Vendor Data	1.84	2.03	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.06	0.07
2	Solar Centaur T-4700 Turbine #2								
3	Solar Taurus 60 T-7300S Turbine #3	0.0063 lb/MMBtu	Vendor Data	0.82	0.90	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.05	0.06
4	Solar Taurus 60 T-7300S Turbine #4	0.0063 lb/MMBtu	Vendor Data	0.55	0.60	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.04	0.04
8	Waukesha L-7042G Engine #1	1.0 g/HP-hr	Vendor Data	5.08	5.60	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
9	Waukesha L-7042G Engine #4	1.0 g/HP-hr	Vendor Data	4.88	5.38	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
10	Black Sivalls Glycol Heater #1	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.05	0.06	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
12	Black Sivalls Glycol Heater #3								
20	Caterpillar D-398 Engine #1	0.16 lb/hr	Vendor Data	0.02	0.02	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
21	Caterpillar D-398 Engine #2	0.16 lb/hr	Vendor Data	0.03	0.03	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
24	Caterpillar C9.3 Crane Engine	0.001 lb/gal	Vendor Data	0.00	0.00	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
25	Caterpillar C13 Crane Engine	0.001 lb/gal	Vendor Data	0.00	0.00	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
28	John Deere 4039 Compressor Engine	0.049 lb/hr	Vendor Data	0.00	0.00	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
33	Caterpillar 3306 Firewater Engine #1	0.273 lb/hr	Vendor Data	0.00	0.00	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
34	Caterpillar 3306 Firewater Engine #2	0.273 lb/hr	Vendor Data	0.01	0.01	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
37	HP & LP Flare Pilot - routine	0.080 lb/MMBtu	AP-42 Table 13.5-1&2 (1/95)	0.63	0.70	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
38	HP Safety Flare - routine	0.080 lb/MMBtu	AP-42 Table 13.5-1&2 (1/95)	0.17	0.19	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
39	LP Safety Flare - routine	0.080 lb/MMBtu	AP-42 Table 13.5-1&2 (1/95)	0.58	0.63	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
N/A	Glycol Regenerator #1	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.10	0.12	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
N/A	Glycol Regenerator #2								
N/A	Glycol Regenerator #3								
40	Glycol Regen No. 1 Vent								
41	Glycol Regen No. 2 Vent								
42	Glycol Regen No. 3 Vent								
N/A	HP Safety Flare - nonroutine	0.080 lb/MMBtu	AP-42 Table 13.5-1&2 (1/95)	0.00	0.00	0.42 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
N/A	Rig Boiler(s) - nonroutine	0.2 lb/1000 gal	AP-42 Table 1.3-3 (09/98)	0.00	0.00	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	NREs < 600 hp - nonroutine	0.0023 lb/hp-hr	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	1.06	1.17	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	NREs > 600 hp - nonroutine	0.00064 lb/hp-hr	AP-42 Table 3.4-1 (10/96)	0.00	0.00	0.00010 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	Enerco HeatStar HS125KT Heater	0.2 lb/1000 gal	AP-42 Table 1.3-3 (5/10)	0.00	0.00	0.00688 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
			Total Nonroutine Emissions	1.07	1.17		Total Nonroutine Emissions	0.00	0.00
			Total Emissions	16	17		Total Emissions	0.19	0.21
			Total Assesable Emissions (excludes NREs)		16		Total Assesable Emissions (excludes NREs)		0

Attachment No. 6

Kenai LNG Plant

2014 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_X			
								Actual Emissions	
ID	Emission Unit Name/ Description	Design Capacity	Fuel Type	Actual Throughput or Usage	Calculated Throughput (NG fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	156 MMBtu/hr (LHV)	NG	262.2 MMscf	7,425,326 scm	0.2663 lb/MMBtu (LHV)	Source Test (10-July-2014)	28.9	31.8
2	GE Frame 5 Turbine #152	156 MMBtu/hr (LHV)	NG	669.4 MMscf	18,956,476 scm	0.2663 lb/MMBtu (LHV)	Source Test (10-July-2014)	73.7	81.2
3	GE Frame 5 Turbine #251	234 MMBtu/hr (LHV)	NG	218.9 MMscf	6,198,464 scm	0.3271 lb/MMBtu (LHV)	Source Test (11-July-2014)	29.6	32.6
4	GE Frame 5 Turbine #252	229 MMBtu/hr (LHV)	NG	637.5 MMscf	18,052,710 scm	0.3271 lb/MMBtu (LHV)	Source Test (11-July-2014)	86.2	95.0
5	GE Frame 5 Turbine #351	156 MMBtu/hr (LHV)	NG	62.2 MMscf	1,760,042 scm	0.241 lb/MMBtu (LHV)	Source Test (11-July-2014)	6.2	6.8
6	GE Frame 5 Turbine #352	156 MMBtu/hr (LHV)	NG	590.5 MMscf	16,721,548 scm	0.241 lb/MMBtu (LHV)	Source Test (11-July-2014)	58.8	64.8
7	Solar Taurus 60 Turbine #701 - SoLoNOx	60 MMBtu/hr (LHV)	NG	124.4 MMscf	3,522,635 scm	0.0261 lb/MMBtu (LHV)	Source Test (9-July-2014)	1.3	1.5
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	60 MMBtu/hr (LHV)	NG	1.8 MMscf	51,537 scm	0.233 lb/MMBtu (LHV)	2006 Source Test	0.2	0.2
8	Erie City 9M Boiler #501	47 MMBtu/hr	NG	48.8 MMscf	1,380,822 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.2	2.4
9	Erie City 9M Boiler #502	47 MMBtu/hr	NG	61.1 MMscf	1,729,178 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.8	3.1
10	Erie City 9M Boiler #511	46 MMBtu/hr	NG	103.1 MMscf	2,920,700 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	4.7	5.2
11	Cat D-379 Emergency Generator	350 kW	Diesel	2,078.2 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.6	0.63
12	Cat 3406 FW Pump #2	375 hp	Diesel						
13	Cat 3406 FW Pump #3	375 hp	Diesel						
14	Cat 3306 FW Pump #4	231 hp	Diesel						
15	Ground Flare (including pilot)	148 MMscf/day	NG	173.3 MMscf	4,906,770 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	5.3	5.8
N/A	Nonroutine Flaring	148 MMscf/day	NG	5.1 MMscf	143,596 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.15	0.17
N/A	Nonroutine Venting		N/A	MMscf	N/A				
N/A	Routine Venting - Seal Oil Vents		N/A	N/A	N/A				
N/A	Routine Venting - Misc Vents - (Bertha, Turbine starter vents, LNG tank breathing vents)		N/A	80.7 MMscf	N/A				
16	Routine Venting - Amine Treater Vent	15,300 scf/hr	N/A	4,296.0 hours	N/A				
17	John Deere 4039 Sullair Compressor #5	78 hp	Diesel	151.8 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.04	0.05
N/A	Small Heaters and Boilers	15 MMBtu/hr	NG	133.2 MMscf	3,772,155 scm	100 lb/MMscf	AP-42 Table 1.4-1	6.0	6.7
N/A	Imported Electricity		N/A	14,379,244 kW-hr	N/A				
							Total Nonroutine Emissions	0.15	0.17
							Total Emissions	307	338
							Total Assesable Emissions		338

Fuel	HHV	LHV	Sulfur Content	Density
NG	986.4 Btu/scf	911 Btu/scf	1.0 ppmv H_2S	----
Diesel	136,680 Btu/gal	---	0.00048 wt% S	6.94 lb/gal

2014 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.0296 lb/MMBtu (LHV)	Source Test (10-July-2014)	3.2	3.5	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.7	0.8
2	GE Frame 5 Turbine #152	0.0296 lb/MMBtu (LHV)	Source Test (10-July-2014)	8.2	9.0	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.9	2.1
3	GE Frame 5 Turbine #251	0.0155 lb/MMBtu (LHV)	Source Test (11-July-2014)	1.4	1.5	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.6	0.7
4	GE Frame 5 Turbine #252	0.0155 lb/MMBtu (LHV)	Source Test (11-July-2014)	4.1	4.5	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.8	2.0
5	GE Frame 5 Turbine #351	0.0435 lb/MMBtu (LHV)	Source Test (11-July-2014)	1.1	1.2	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.2	0.2
6	GE Frame 5 Turbine #352	0.0435 lb/MMBtu (LHV)	Source Test (11-July-2014)	10.6	11.7	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.7	1.9
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0022 lb/MMBtu (LHV)	Source Test (9-July-2014)	0.1	0.1	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.4	0.4
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	3.217 lb/MMBtu (LHV)	2006 Source Test	2.4	2.7	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.0	0.0
8	Erie City 9M Boiler #501	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.9	2.0	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.17	0.2
9	Erie City 9M Boiler #502	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.3	2.6	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.21	0.2
10	Erie City 9M Boiler #511	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	3.9	4.3	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.36	0.4
11	Cat D-379 Emergency Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.12	0.13	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.04	0.04
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	0.37 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	28.7	31.6	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	2.0	2.3
N/A	Nonroutine Flaring	0.37 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.84	0.93	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (1/95)	0.06	0.07
N/A	Nonroutine Venting								
N/A	Routine Venting - Seal Oil Vents								
N/A	Routine Venting - Misc Vents - (Bertha, Turbine starter vents, LNG tank breathing vents)								
16	Routine Venting - Amine Treater Vent								
17	John Deere 4039 Sullair Compressor #5	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.003	0.003
N/A	Small Heaters and Boilers	84 lb/MMscf	AP-42 Table 1.4-1	5.1	5.6	7.6 lb/MMscf	AP-42 Table 1.4-2	0.46	0.51
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.84	0.93		Total Nonroutine Emissions	0.06	0.07
			Total Emissions	74	82		Total Emissions	11	12
			Total Assesable Emissions		82		Total Assesable Emissions		12

2014 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.2	0.3	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.020	0.022
2	GE Frame 5 Turbine #152	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.6	0.7	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.051	0.056
3	GE Frame 5 Turbine #251	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.2	0.2	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.017	0.018
4	GE Frame 5 Turbine #252	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.6	0.6	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.049	0.054
5	GE Frame 5 Turbine #351	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.1	0.1	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.005	0.005
6	GE Frame 5 Turbine #352	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.5	0.6	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.045	0.050
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.11	0.1	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.010	0.010
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.0	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
8	Erie City 9M Boiler #501	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.12	0.1	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.004	0.004
9	Erie City 9M Boiler #502	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.15	0.2	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.005	0.005
10	Erie City 9M Boiler #511	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.26	0.3	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.008	0.009
11	Cat D-379 Emergency Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.042	0.05	6.72E-05 lb/gal	Lab Analysis / Mass Balance	0.000	0.000
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	0.080 lb/MMBtu	AP-42 Table 13.5-1&2 (1/95)	6.19	6.82	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.013	0.015
N/A	Nonroutine Flaring	0.080 lb/MMBtu	AP-42 Table 13.5-1&2 (1/95)	0.18	0.20	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
N/A	Nonroutine Venting	150 ppmv C3H8	Mass Balance (Vent Gas Composition)	0.0	0.0				
N/A	Routine Venting - Seal Oil Vents	294 tpy	Mass Balance	267	294				
N/A	Routine Venting - Misc Vents - (Bertha, Turbine starter vents, LNG tank breathing vents)	150 ppmv C3H8	Mass Balance (Vent Gas Composition)	0.6	0.7				
16	Routine Venting - Amine Treater Vent								
17	John Deere 4039 Sullair Compressor #5	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.003	0.003	6.72E-05 lb/gal	Lab Analysis / Mass Balance	0.000	0.000
N/A	Small Heaters and Boilers	5.5 lb/MMscf	AP-42 Table 1.4-2	0.3	0.4	0.17 lb/MMscf	Mass Balance	0.010	0.011
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.18	0.20		Total Nonroutine Emissions	0.000	0.000
			Total Emissions	277	305		Total Emissions	0.24	0.26
			Total Assesable Emissions		305		Total Assesable Emissions		0

Attachment No. 7

Beluga River Unit

2014 Assessable Emissions Estimate
Permit No. AQ0942TVP01
Beluga River Unit

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_X			
								Emissions	
ID	Emission Unit Name/Description	Total Design Capacity	Fuel Type	Actual Throughput or Usage	Calculated Throughput (NG fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	Solar Taurus 60 Turbine - SoLoNOx	60 MMBtu/hr	NG	555.9 MMscf	15,740,204 scm	0.0428 lb/MMBtu (LHV)	Source Test (23-Aug-2014)	9.74	10.74
1	Solar Taurus 60 Turbine - NonSoLoNOx	60 MMBtu/hr	NG	0.04 MMscf	1,025 scm	0.2 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00
2	Waukesha H24GLD MOC Compressor Drive	530 hp	NG	6.6 MMscf	187,771 scm	2 g/hp-hr	Vendor Data	1.88	2.07
3	John Deere Engine Generator	420 kW	Diesel	80.4 gal	N/A	6.4 g/kW-hr	Vendor Data	0.01	0.01
12	Cummins Engine Generator	350 kW	Diesel	174.4 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.05	0.05
19	Duetz Engine Generator	50 kW	Diesel	37.4 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01
26	Thermal Engine Corp Incinerator	150 lb/hr	SW	0.9 ton	N/A	3 lb/ton	AP-42 Table 2.1-12 (10/96)	0.00	0.00
26	Thermal Engine Corp Incinerator (supplemental gas-fired burner)	0.8 MMBtu/hr	NG	0.02 MMscf	442 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.00	0.00
37	Wellsite Compressor Engines (@ 400 hp)	800 hp	NG	46.7 MMscf	1,323,164 scm	0.34 g/hp-hr	Source test (Sep-2013)	2.35	2.59
37	Wellsite Compressor Engines (@ 740 hp)	5180 hp	NG	290.9 MMscf	8,238,021 scm	0.156 lb/MMBtu (HHV)	Source test (Aug-2014)	20.57	22.67
42	Caterpillar Generator Engine	381 hp	Diesel	206.2 gal	N/A	2.23 lb/hr	Vendor Data	0.01	0.01
4-6	Pad H Glycol Dehydration Units	0.65 MMBtu/hr	NG	5.7 MMscf	161,398 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.26	0.28
7	Pad A Glycol Dehydration Units	0.075 MMBtu/hr	NG	0.0 MMscf	0 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.00	0.00
8	Pad B Glycol Dehydration Units	0.25 MMBtu/hr	NG	2.2 MMscf	62,076 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.10	0.11
9-10	Pad C Glycol Dehydration Units	0.50 MMBtu/hr	NG	4.4 MMscf	124,153 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.20	0.22
13	Pad D Glycol Dehydration Unit	0.25 MMBtu/hr	NG	2.2 MMscf	62,076 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.10	0.11
14-15	Pad E Glycol Dehydration Units	0.25 MMBtu/hr	NG	2.2 MMscf	62,076 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.10	0.11
16	Pad F Glycol Dehydration Unit	0.25 MMBtu/hr	NG	2.2 MMscf	62,076 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.10	0.11
17	Pad G Glycol Dehydration Unit	0.50 MMBtu/hr	NG	4.4 MMscf	124,153 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.20	0.22
18	Pad I Glycol Dehydration Unit	0.25 MMBtu/hr	NG	2.2 MMscf	62,076 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.10	0.11
21-23	Pad J Glycol Dehydration Units	0.55 MMBtu/hr	NG	4.8 MMscf	136,568 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.22	0.24
24	Pad K Glycol Dehydration Unit	0.25 MMBtu/hr	NG	2.2 MMscf	62,076 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.10	0.11
N/A	NG Fired Heaters (IEUs)	5.2 MMBtu/hr	NG	45.2 MMscf	1,278,772 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.05	2.26
N/A	Diesel Fired Heaters (IEUs)	2.0 MMBtu/hr	Diesel	98,559.5 gal	N/A	20 lb/1000 gal	AP-42 Table 1.3-1 (5/10)	0.89	0.99
N/A	Used Oil Fired Heater - Mechanics Shop (IEU)	0.5 MMBtu/hr	Used Oil	31,739.1 gal	N/A	16.0 lb/1000 gal	AP-42 Table 1.11-2 (10/96)	0.23	0.25
N/A	Dehydration Unit Vents - routine		N/A	N/A	N/A				
N/A	Rig Boiler(s) - nonroutine	Variable MMBtu/hr	Diesel	362.0 gal	N/A	24 lb/1000 gal	AP-42 Table 1.3-1 (5/10)	0.00	0.00
N/A	NREs < 600 hp - nonroutine	Variable hp	Diesel	20,233.4 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	5.34	5.88
N/A	NREs > 600 hp - nonroutine	Variable hp	Diesel	12,643.7 gal	N/A	3.2 lb/MMBtu	AP-42 Table 3.4-1 (10/96)	2.42	2.67
N/A	Venting - nonroutine		N/A	72.3 MMscf	N/A				
N/A	Imported Electricity			5,051,200 kW-hr	N/A				
							Total Nonroutine Emissions	7.76	8.56
							Total Emissions	47.0	51.8
							Total Assesable Emissions (excludes NREs)		43

Fuel	HHV	LHV	Sulfur Content	Density	Ash
NG	999 Btu/scf	903 Btu/scf	1.0 ppmv H_2S	---	---
Diesel	131,900 Btu/gal	---	0.00008 wt% S	6.7 lb/gal	Negligible
Used Oil	138,000 Btu/gal	---	0.5 wt% S	---	0.65 wt%
Solid Waste	9.95 MMBtu/ton	---	---	---	---

2014 Assessable Emissions Estimate
Permit No. AQ0942TVP01
Beluga River Unit

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Emissions				Emissions	
ID	Emission Unit Name/Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	Solar Taurus 60 Turbine - SoLoNOx	0.0037 lb/MMBtu (LHV)	Source Test (23-Aug-2014)	0.84	0.93	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.63	1.79
1	Solar Taurus 60 Turbine - NonSoLoNOx	3.2 lb/MMBtu (LHV)	2007 Source Test	0.05	0.05	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
2	Waukesha H24GLD MOC Compressor Drive	1.75 g/hp-hr	Vendor Data	1.64	1.81	0.01 lb/MMBtu	AP-42 Table 3.2-2 (07/00)	0.03	0.03
3	John Deere Engine Generator	3.5 g/kW-hr	Vendor Data	0.00	0.00	3.5 g/kW-hr	Vendor Data	0.00	0.00
12	Cummins Engine Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.00	0.00
19	Duetz Engine Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.00	0.00	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.00	0.00
26	Thermal Engine Corp Incinerator	10 lb/ton	AP-42 Table 2.1-12 (10/96)	0.00	0.00	7.0 lb/ton	AP-42 Table 2.1-12 (10/96)	0.00	0.00
26	Thermal Engine Corp Incinerator (supplemental gas-fired burner)	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.00	0.00	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.00	0.00
37	Wellsite Compressor Engines (@ 400 hp)	0.26 g/hp-hr	Source test (Sep-2013)	1.80	1.98	0.0095 lb/MMBtu	AP-42 Table 3.2-3 (07/00)	0.20	0.22
37	Wellsite Compressor Engines (@ 740 hp)	0.171 lb/MMBtu (HHV)	Source test (Aug-2014)	22.54	24.85	0.0095 lb/MMBtu	AP-42 Table 3.2-3 (07/00)	1.25	1.38
42	Caterpillar Generator Engine	0.47 lb/hr	Vendor Data	0.00	0.00	0.09 lb/hr	Vendor Data	0.00	0.00
4-6	Pad H Glycol Dehydration Units	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.22	0.24	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.02	0.02
7	Pad A Glycol Dehydration Units	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.00	0.00	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.00	0.00
8	Pad B Glycol Dehydration Units	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.08	0.09	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01
9-10	Pad C Glycol Dehydration Units	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.17	0.18	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.02	0.02
13	Pad D Glycol Dehydration Unit	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.08	0.09	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01
14-15	Pad E Glycol Dehydration Units	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.08	0.09	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01
16	Pad F Glycol Dehydration Unit	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.08	0.09	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01
17	Pad G Glycol Dehydration Unit	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.17	0.18	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.02	0.02
18	Pad I Glycol Dehydration Unit	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.08	0.09	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01
21-23	Pad J Glycol Dehydration Units	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.18	0.20	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.02	0.02
24	Pad K Glycol Dehydration Unit	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.08	0.09	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01
N/A	NG Fired Heaters (IEUs)	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.72	1.90	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.16	0.17
N/A	Diesel Fired Heaters (IEUs)	5 lb/1000 gal	AP-42 Table 1.3-1 (5/10)	0.22	0.25	3.3 lb/1000 gal	AP-42 Table 1.3-1/1.3-2 (5/10)	0.15	0.16
N/A	Used Oil Fired Heater - Mechanics Shop (IEU)	2.1 lb/1000 gal	AP-42 Table 1.11-2 (10/96)	0.03	0.03	37.05 lb/1000 gal	AP-42 Table 1.11-1 (10/96)	0.53	0.59
N/A	Dehydration Unit Vents - routine								
N/A	Rig Boiler(s) - nonroutine	5 lb/1000 gal	AP-42 Table 1.3-1 (5/10)	0.00	0.00	3.3 lb/1000 gal	AP-42 Table 1.3-1/1.3-2 (5/10)	0.00	0.00
N/A	NREs < 600 hp - nonroutine	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	1.15	1.27	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.38	0.41
N/A	NREs > 600 hp - nonroutine	0.85 lb/MMBtu	AP-42 Table 3.4-1 (10/96)	0.64	0.71	0.0573 lb/MMBtu	AP-42 Table 3.4-2 (10/96)	0.04	0.05
N/A	Venting - nonroutine								
N/A	Imported Electricity								
			Total Nonroutine Emissions	1.79	1.98		Total Nonroutine Emissions	0.42	0.46
			Total Emissions	31.9	35.2		Total Emissions	4.49	4.95
			Total Assesable Emissions (excludes NREs)		33		Total Assesable Emissions (excludes NREs)		0

2014 Assessable Emissions Estimate
Permit No. AQ0942TVP01
Beluga River Unit

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Emissions				Emissions	
ID	Emission Unit Name/Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	Solar Taurus 60 Turbine - SoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.52	0.57	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.04	0.05
1	Solar Taurus 60 Turbine - NonSoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
2	Waukesha H24GLD MOC Compressor Drive	0.118 lb/MMBtu	AP-42 Table 3.2-2 (07/00)	0.35	0.39	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
3	John Deere Engine Generator	3.5 g/kW-hr	Vendor Data	0.00	0.00	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
12	Cummins Engine Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.00	0.00	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
19	Duetz Engine Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.00	0.00	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
26	Thermal Engine Corp Incinerator	3.0 lb/ton	AP-42 Table 2.1-12 (10/96)	0.00	0.00	2.5 lb/ton	AP-42 Table 2.1-12 (10/96)	0.00	0.00
26	Thermal Engine Corp Incinerator (supplemental gas-fired burner)	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
37	Wellsite Compressor Engines (@ 400 hp)	0.01 g/hp-hr	Source test (Sep-2013)	0.07	0.08	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
37	Wellsite Compressor Engines (@ 740 hp)	0.01 lb/MMBtu (HHV)	Source test (Aug-2014)	1.32	1.45	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.02	0.02
42	Caterpillar Generator Engine	0.13 lb/hr	Vendor Data	0.00	0.00	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
4-6	Pad H Glycol Dehydration Units	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.02	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
7	Pad A Glycol Dehydration Units	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
8	Pad B Glycol Dehydration Units	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
9-10	Pad C Glycol Dehydration Units	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
13	Pad D Glycol Dehydration Unit	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
14-15	Pad E Glycol Dehydration Units	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
16	Pad F Glycol Dehydration Unit	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
17	Pad G Glycol Dehydration Unit	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
18	Pad I Glycol Dehydration Unit	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
21-23	Pad J Glycol Dehydration Units	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
24	Pad K Glycol Dehydration Unit	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
N/A	NG Fired Heaters (IEUs)	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.11	0.12	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
N/A	Diesel Fired Heaters (IEUs)	0.2 lb/1000 gal	AP-42 Table 1.3-3 (5/10)	0.01	0.01	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	Used Oil Fired Heater - Mechanics Shop (IEU)	1.0 lb/1000 gal	AP-42 Table 1.11-3 (10/96)	0.01	0.02	53.5 lb/1000 gal	AP-42 Table 1.11-2 (10/96)	0.77	0.85
N/A	Dehydration Unit Vents - routine								
N/A	Rig Boiler(s) - nonroutine	0.34 lb/1000 gal	AP-42 Table 1.3-3 (5/10)	0.00	0.00	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	NREs < 600 hp - nonroutine	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.39	0.43	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	NREs > 600 hp - nonroutine	0.0819 lb/MMBtu	AP-42 Table 3.4-1 (10/96)	0.06	0.07	1.07E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	Venting - nonroutine								
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.45	0.50		Total Nonroutine Emissions	0.00	0.00
			Total Emissions	2.94	3.24		Total Emissions	0.85	0.93
			Total Assesable Emissions (excludes NREs)		0		Total Assesable Emissions (excludes NREs)		0

TESORO

Tesoro Alaska Company
54741 Tesoro Road
P.O. Box 3369
Kenai, Alaska 99611
907 776 8191 Phone
907 776 3801 Fax

March 27, 2015

Mailed Certified
Receipt No. 7011 1570 0001 6400 4339

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue
Juneau, Alaska 99811-1800

RE: Tesoro Alaska Company LLC
Kenai Refinery
Permit No. 035TVP02 Rev. 3
2014 Emission Fees Report

To Whom It May Concern:

Tesoro Alaska Company LLC (Tesoro) has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2014 in accordance with 18 AAC 50.410 for Tesoro's Kenai Refinery. Enclosed is one copy of the emission fee report which includes all of the assumptions and calculations used to estimate the assessable emissions. The second copy is being delivered via email. A summary of 2014 emissions is provided in the table below.

Activity	**Pollutant Emissions (tons/year)**					
	VOC	**NOx**	**SOx**	**CO**	**PM10**	**Total**
Tanks	67.2	0.0	0.0	0.0	0.0	67.2
Component Leaks	13.7	0.0	0.0	0.0	0.0	13.7
Combustion	20.3	399.9	8.4	303.6	29.2	761.5
Wastewater Treatment	12.5	0.0	0.0	0.0	0.0	12.5
Material Use	2.3	0.0	0.0	0.0	0.0	2.3
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	3.4	0.0	0.0	3.4
Pressure Release	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.0	0.0	0.0	0.0	1.0	1.0
Total	116.0	399.9	11.8	303.6	30.2	861.6

If you have any questions please contact Michelle Lee of my staff at (907) 776-3594. 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.

Sincerely,

Cameron Hunt
Vice President, Kenai Refinery

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2014 Emission Fee Report

TESORO ALASKA COMPANY
KENAI REFINERY

MARCH 2015

Prepared for:
TESORO ALASKA COMPANY
Kenai, Alaska

•••

Prepared by:
Verdant Environmental
South Pasadena, California

Table 27: Total emissions from the Kenai refinery in 2014

Activity	Pollutant Emissions (tons/year)					
	VOC	NOx	SOx	CO	PM10	Total
Tanks	67.2	0.0	0.0	0.0	0.0	67.2
Component Leaks	13.7	0.0	0.0	0.0	0.0	13.7
Combustion	20.3	399.9	8.4	303.6	29.2	761.5
Wastewater Treatment	12.5	0.0	0.0	0.0	0.0	12.5
Material Use	2.3	0.0	0.0	0.0	0.0	2.3
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	3.4	0.0	0.0	3.4
Pressure Release	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.03	0.0	0.0	0.0	1.0	1.0
Total	116.0	399.9	11.8	303.6	30.2	861.6

Attachment No. 8

Cook Inlet
Kenai LNG Plant

Laura K. Perry
Coordinator – Air Quality
ConocoPhillips Alaska
700 G Street
Anchorage, AK 99510
Phone 907.265.6937
Fax 907-265-6216

RECEIVED
APR 01 2016
ADEC AQ

ConocoPhillips

Certified Mail
7010 3090 0002 2170 1816
Return Receipt Requested

March 31, 2016

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Ave., Suite 303
Juneau, AK 99811-1800

Subject: Alaska FY2017 Emission Fee Estimates for North Slope and Cook Inlet Facilities

ConocoPhillips Alaska, Inc. (CPAI) is submitting this emission fee estimate for state fiscal year 2017. CPAI estimates the assessable emissions for our North Slope and Cook Inlet stationary sources as follows:

Source	Assessable Emissions (tons per year)					
	NOx	CO	PM10	VOC	SO2	TOTAL
CPF-1 (incl. DS1E/1J) (AQ0267TVP01)	1774.5	210.0	55.2	470.7	89.9	**2600**
CPF-2 (AQ0273TVP01)	1675.2	124.6	53.4	425.6	72.9	**2352**
CPF-3 (AQ0171TVP01)	1026.4	572.8	42.5	65.2	106.8	**1814**
Kuparuk Seawater Treatment Plant (AQ0172TVP02)	109.8	<10	<10	<10	10.1	**120**
Kuparuk Transportable Drilling Rigs (AQ0909TVP01)	<10	<10	<10	18.8	<10	**19**
Kuparuk Sharktooth DS-2S (AQ1429MSS01 and AQ1429MSS02)	<10	<10	<10	<10	<10	**0**
Alpine CPF and Non-TCA Doyon 19 (AQ0489TVP01)	971.0	152.5	28.3	43.0	17.1	**1212**
Alpine Transportable Drilling Rigs (No permit)	<10	<10	<10	<10	<10	**0**
Alpine CD-5 (AQ0945MSS01)	<10	<10	<10	<10	<10	**0**

Source	Assessable Emissions (tons per year)					
	NOx	CO	PM10	VOC	SO2	TOTAL
Tyonek Platform (AQ0091TVP02)	97	34	<10	14	<10	**145**
Kenai LNG Plant (AQ0090TVP02)	369	63	12	299	<10	**743**
Beluga River Unit (AQ0942TVP01)	52	42	<10	<10	<10	**94**

These estimates are based on projected actual emissions and are derived from actual operation during calendar year 2015. Documentation of relevant operational data and pollutant-by-pollutant emission calculations is included in the attachments.

Please contact me at (907) 265-6937 if you have any questions.

Sincerely,

Laura Perry
Coordinator – Air Quality

Attachments:

Attachment 1 – Kuparuk River Unit CPF-1 (incl. DS-1E/1J), CPF-2, CPF-3, KSTP
Attachment 2 – Kuparuk River Unit Transportable Drilling Rigs
Attachment 3 – Kuparuk Sharktooth DS-2S
Attachment 4 – Alpine Central Processing Facility and Non-TCA Doyon 19
Attachment 5 – Alpine Transportable Drilling Rigs
Attachment 6 – Alpine CD-5
Attachment 7 – Cook Inlet Tyonek Platform
Attachment 8 – Cook Inlet Kenai LNG Plant
Attachment 9 – Cook Inlet Beluga River Unit

Statement of Certification (Kuparuk and Alpine CPF)

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: Patrick Wolfe Date: March 29th 2016

Patrick Wolfe
Manager, North Slope Integrated Operations

Statement of Certification (Transportable Drill Rigs)

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: M. W. Wheatall Date: 3/29/16

Michael Wheatall
Manager, Drilling and Well Operations

Statement of Certification (Cook Inlet)

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: ______ Date: 3-31-16

Michael Mindrup
Cook Inlet Asset Manager

2015 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_x			
								Actual Emissions	
ID	Emission Unit Name/ Description	Design Capacity	Fuel Type	Actual Throughput or Usage	Calculated Throughput (NG fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	156 MMBtu/hr (LHV)	NG	505.7 MMscf	14,319,907 scm	0.248 lb/MMBtu (HHV)	Source Test (29-July-2015)	57.4	63.3
2	GE Frame 5 Turbine #152	156 MMBtu/hr (LHV)	NG	515.9 MMscf	14,608,740 scm	0.248 lb/MMBtu (HHV)	Source Test (29-July-2015)	58.6	64.6
3	GE Frame 5 Turbine #251	234 MMBtu/hr (LHV)	NG	698.8 MMscf	19,787,920 scm	0.288 lb/MMBtu (HHV)	Source Test (30-July-2015)	92.2	101.6
4	GE Frame 5 Turbine #252	229 MMBtu/hr (LHV)	NG	269.4 MMscf	7,628,600 scm	0.288 lb/MMBtu (HHV)	Source Test (30-July-2015)	35.5	39.2
5	GE Frame 5 Turbine #351	156 MMBtu/hr (LHV)	NG	338.1 MMscf	9,573,978 scm	0.206 lb/MMBtu (HHV)	Source Test (29-July-2015)	31.9	35.2
6	GE Frame 5 Turbine #352	156 MMBtu/hr (LHV)	NG	389.8 MMscf	11,037,967 scm	0.206 lb/MMBtu (HHV)	Source Test (29-July-2015)	36.8	40.5
7	Solar Taurus 60 Turbine #701 - SoLoNOx	60 MMBtu/hr (LHV)	NG	150.6 MMscf	4,264,823 scm	0.0261 lb/MMBtu (LHV)	Source Test (9-July-2014)	1.62	1.79
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	60 MMBtu/hr (LHV)	NG	0.3 MMscf	8,778 scm	0.233 lb/MMBtu (LHV)	2006 Source Test	0.03	0.03
8	Erie City 9M Boiler #501	47 MMBtu/hr	NG	105.5 MMscf	2,987,160 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	4.74	5.22
9	Erie City 9M Boiler #502	47 MMBtu/hr	NG	35.4 MMscf	1,002,988 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.59	1.75
10	Erie City 9M Boiler #511	46 MMBtu/hr	NG	88.1 MMscf	2,495,577 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	3.96	4.36
11	Cat D-379 Emergency Generator	350 kW	Diesel	2,410.8 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.64	0.71
12	Cat 3406 FW Pump #2	375 hp	Diesel						
13	Cat 3406 FW Pump #3	375 hp	Diesel						
14	Cat 3306 FW Pump #4	231 hp	Diesel						
15	Ground Flare (including pilot)	148 MMscf/day	NG	105.2 MMscf	2,980,081 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (4/15)	3.28	3.61
N/A	Nonroutine Flaring	148 MMscf/day	NG	7.1 MMscf	200,768 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (4/15)	0.22	0.24
N/A	Nonroutine Venting		N/A	0 MMscf	N/A				
N/A	Routine Venting - Turbine Compressor Seal Oil Degassing Vents		N/A	N/A	N/A				
N/A	Routine Venting - Electric Compressor Seal Oil Degassing Vents		N/A	4,513 hours	N/A				
N/A	Routine Venting - Misc Vents - (Bertha, Turbine starter vents, LNG tank breathing vents)		N/A	119.1 MMscf	N/A				
16	Routine Venting - Amine Treater Vent	15,300 scf/hr	N/A	4,560.0 hours	N/A				
17	John Deere 4039 Sullair Compressor #5	78 hp	Diesel	104.6 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.03	0.03
N/A	Small Heaters and Boilers	15 MMBtu/hr	NG	130.2 MMscf	3,685,838 scm	100 lb/MMscf	AP-42 Table 1.4-1	5.84	6.44
N/A	Imported Electricity		N/A	15,441,158 kW-hr	N/A				
							Total Nonroutine Emissions	0.22	0.24
							Total Emissions	334	369
							Total Assesable Emissions		369

Fuel	HHV	LHV	Sulfur Content	Density
NG	1009.5 Btu/scf	908.6 Btu/scf	1.0 ppmv H_2S	----
Diesel	133,131 Btu/gal	—	0.00015 wt% S	6.76 lb/gal

2015 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.020 lb/MMBtu (HHV)	Source Test (29-July-2015)	4.63	5.11	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.53	1.68
2	GE Frame 5 Turbine #152	0.020 lb/MMBtu (HHV)	Source Test (29-July-2015)	4.72	5.21	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.56	1.72
3	GE Frame 5 Turbine #251	0.012 lb/MMBtu (HHV)	Source Test (30-July-2015)	3.84	4.23	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	2.11	2.33
4	GE Frame 5 Turbine #252	0.012 lb/MMBtu (HHV)	Source Test (30-July-2015)	1.48	1.63	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.81	0.90
5	GE Frame 5 Turbine #351	0.041 lb/MMBtu (HHV)	Source Test (29-July-2015)	6.35	7.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.02	1.13
6	GE Frame 5 Turbine #352	0.041 lb/MMBtu (HHV)	Source Test (29-July-2015)	7.32	8.07	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	1.18	1.30
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0022 lb/MMBtu (LHV)	Source Test (9-July-2014)	0.14	0.15	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.46	0.50
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	3.217 lb/MMBtu (LHV)	2006 Source Test	0.41	0.45	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
8	Erie City 9M Boiler #501	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	3.98	4.38	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.36	0.40
9	Erie City 9M Boiler #502	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.34	1.47	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.12	0.13
10	Erie City 9M Boiler #511	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	3.32	3.66	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.30	0.33
11	Cat D-379 Emergency Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.14	0.15	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.05	0.05
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	0.31 lb/MMBtu	AP-42 Table 13.5-2 (4/15)	13.4	14.8	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (4/15)	1.27	1.40
N/A	Nonroutine Flaring	0.31 lb/MMBtu	AP-42 Table 13.5-2 (4/15)	0.91	1.00	0.0264 lb/MMBtu	AP-42 Table 13.5-1 (4/15)	0.09	0.09
N/A	Nonroutine Venting								
N/A	Routine Venting - Turbine Compressor Seal Oil Degassing Vents								
N/A	Routine Venting - Electric Compressor Seal Oil Degassing Vents								
N/A	Routine Venting - Misc Vents - (Bertha, Turbine starter vents, LNG tank breathing vents)								
16	Routine Venting - Amine Treater Vent								
17	John Deere 4039 Sullair Compressor #5	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.002	0.002
N/A	Small Heaters and Boilers	84 lb/MMscf	AP-42 Table 1.4-1	4.91	5.41	7.6 lb/MMscf	AP-42 Table 1.4-2	0.44	0.49
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.91	1.00		Total Nonroutine Emissions	0.09	0.09
			Total Emissions	57	63		Total Emissions	11	12
			Total Assesable Emissions		63		Total Assesable Emissions		12

2015 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.49	0.54	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.04	0.04
2	GE Frame 5 Turbine #152	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.50	0.55	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.04	0.04
3	GE Frame 5 Turbine #251	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.67	0.74	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.05	0.06
4	GE Frame 5 Turbine #252	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.26	0.29	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.02	0.02
5	GE Frame 5 Turbine #351	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.33	0.36	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.03	0.03
6	GE Frame 5 Turbine #352	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.37	0.41	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.03	0.03
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.14	0.16	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
8	Erie City 9M Boiler #501	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.26	0.29	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
9	Erie City 9M Boiler #502	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.09	0.10	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
10	Erie City 9M Boiler #511	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.22	0.24	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
11	Cat D-379 Emergency Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.05	0.05	2.06E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	2.92 lb/MMscf	Gas Composition and Flare Destruction Efficiency of 98%	0.14	0.15	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.01	0.01
N/A	Nonroutine Flaring	2.92 lb/MMscf		0.01	0.01	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.00	0.00
N/A	Nonroutine Venting	150 ppmv C3H8	Mass Balance (Vent Gas Composition)	0.00	0.00				
N/A	Routine Venting - Turbine Compressor Seal Oil Degassing Vents	294 tpy	Mass Balance	266.7	294.0				
N/A	Routine Venting - Electric Compressor Seal Oil Degassing Vents	0.41 scf FG/hour	Flow Measurements	1.22E-04	1.35E-04				
N/A	Routine Venting - Misc Vents - (Bertha, Turbine starter vents, LNG tank breathing vents)	150 ppmv C3H8	Mass Balance (Vent Gas Composition)	0.94	1.04				
16	Routine Venting - Amine Treater Vent								
17	John Deere 4039 Sullair Compressor #5	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.002	0.002	2.06E-05 lb/gal	Lab Analysis / Mass Balance	0.00	0.00
N/A	Small Heaters and Boilers	5.5 lb/MMscf	AP-42 Table 1.4-2	0.32	0.35	0.17 lb/MMscf	Mass Balance	0.01	0.01
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.01	0.01		Total Nonroutine Emissions	0.00	0.00
			Total Emissions	272	299		Total Emissions	0.26	0.28
			Total Assesable Emissions		299		Total Assesable Emissions		0

TESORO

Tesoro Alaska Company
54741 Tesoro Road
P.O. Box 3369
Kenai, Alaska 99611
907 776 8191 Phone
907 776 3801 Fax

March 28, 2016

Mailed Certified
Receipt No. 7015 0640 0003 6646 3276

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue
Juneau, Alaska 99811-1800

RE: Tesoro Alaska Company LLC
Kenai Refinery
Permit No. 035TVP02
2015 Emission Fees Report

To Whom It May Concern:

Tesoro Alaska Company LLC (Tesoro) has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2015 in accordance with 18 AAC 50.410 for Tesoro's Kenai Refinery. Enclosed is one copy of the emission fee report which includes all of the assumptions and calculations used to estimate the assessable emissions. The second copy is being delivered via email. A summary of 2015 emissions is provided in the table below.

Activity	**Pollutant Emissions (tons/year)**					
	VOC	**NOx**	**SOx**	**CO**	**PM10**	**Total**
Tanks	73.1	0.0	0.0	0.0	0.0	73.1
Component Leaks	13.9	0.0	0.0	0.0	0.0	13.9
Combustion	21.3	430.2	7.8	319.5	30.7	809.5
Wastewater Treatment	12.5	0.0	0.0	0.0	0.0	12.5
Material Use	2.9	0.0	0.0	0.0	0.0	2.9
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	5.5	0.0	0.0	5.5
Pressure Release	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.0	0.0	0.0	0.0	1.0	1.1
Total	123.9	430.2	13.3	319.5	31.8	918.6

If you have any questions please contact Michelle Lee of my staff at (907) 776-3594. 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.

Sincerely,

Cameron Hunt
Vice President, Kenai Refinery

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2015 EMISSION FEE REPORT

TESORO ALASKA COMPANY
KENAI REFINERY

MARCH 2016

Prepared for:
TESORO ALASKA COMPANY
Kenai, Alaska

•••

Prepared by:
Verdant Environmental
South Pasadena, California

Table 27: Total emissions from the Kenai refinery in 2015

Activity	Pollutant Emissions (tons/year)					
	VOC	NOx	SOx	CO	PM10	Total
Tanks	73.1	0.0	0.0	0.0	0.0	73.1
Component Leaks	13.9	0.0	0.0	0.0	0.0	13.9
Combustion	21.3	430.2	7.8	319.5	30.7	809.5
Wastewater Treatment	12.5	0.0	0.0	0.0	0.0	12.5
Material Use	2.9	0.0	0.0	0.0	0.0	2.9
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	5.5	0.0	0.0	5.5
Pressure Release	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.04	0.0	0.0	0.0	1.0	1.1
Total	123.9	430.2	13.3	319.5	31.8	918.6

Laura K. Perry
Coordinator- Air Quality

ConocoPhillips Alaska
700 G Street
Anchorage AK 99501
Phone 907-265-6937
Fax 907-265-6216

Certified Mail
7014 0150 0000 6333 2083
Return Receipt Requested

March 30, 2017

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Ave., Suite 303
Juneau, AK 99811-1800

Subject: Alaska FY2018 Emission Fee Estimates for North Slope and Cook Inlet Facilities

ConocoPhillips Alaska, Inc. (CPAI) is submitting this emission fee estimate for state fiscal year 2018. CPAI estimates the assessable emissions for our North Slope and Kenai LNG stationary sources as follows:

Source	Assessable Emissions (tons per year)					
	NOx	CO	PM10	VOC	SO2	TOTAL
CPF-1 (incl. DS1E/1J) (AQ0267TVP01)	1716.5	208.2	52.6	480.0	91.8	**2549**
CPF-2 (AQ0273TVP01)	1757.6	124.9	55.9	428.5	75.8	**2443**
CPF-3 (AQ0171TVP01)	1039.3	577.3	43.2	66.9	19.7	**1846**
Kuparuk Seawater Treatment Plant (AQ0172TVP02)	101.9	<10	<10	<10	<10	**102**
Kuparuk Transportable Drilling Rigs (AQ0909TVP01)	<10	<10	<10	<10	<10	**0**
Alpine CPF (AQ0489TVP02)	1020.9	175.9	29.0	58.4	18.1	**1302**
Alpine Non-TCA Doyon 19 (AQ1412TVP01)	0	0	0	0	0	**0**
Alpine Transportable Drilling Rigs (No permit)	<10	<10	<10	<10	<10	**0**
Alpine CD-5 (AQ0945MSS01 & AQ0945MSS03)	10.6	<10	<10	<10	<10	**11**
Kenai LNG Plant (AQ0090TVP02)	32.6	46.0	<10	159.6	<10	**238**

These estimates are based on projected actual emissions and are derived from actual operation during calendar year 2016. Documentation of relevant operational data and pollutant-by-pollutant emission calculations is included in the attachments.

Please contact me at (907) 265-6937 if you have any questions.

Sincerely,

Laura K. Perry
Coordinator – Air Quality

Attachments:

Attachment 1 – Kuparuk River Unit CPF-1 (incl. DS-1E/1J), CPF-2, CPF-3, KSTP
Attachment 2 – Kuparuk River Unit Transportable Drilling Rigs
Attachment 3 – Alpine Central Processing Facility
Attachment 4 – Alpine Non-TCA Doyon 19
Attachment 5 – Alpine Transportable Drilling Rigs
Attachment 6 – Alpine CD-5
Attachment 7 – Cook Inlet Kenai LNG Plant

Statement of Certification (Kuparuk and Alpine CPF)

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: Patrick J Wolfe Date: 28 March 2017
Patrick Wolfe
Manager, North Slope Integrated Operations

Statement of Certification (Transportable Drill Rigs)

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: ______________ Date: 3/27/17
Shon D. Robinson
Manager, Drilling and Well Operations

Statement of Certification (Kenai LNG Plant)

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: ______________ Date: 3-23-17
Jay McKee
Cook Inlet Operations Superintendent

Attachment No. 6

Kenai LNG Plant

2016 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_X			
								Actual Emissions	
ID	Emission Unit Name/ Description	Design Capacity	Fuel Type	Actual Throughput or Usage	Calculated Throughput (NG fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	156 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.288 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
2	GE Frame 5 Turbine #152	156 MMBtu/hr (LHV)	NG	42.8 MMscf	1,212,704 scm	0.288 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	5.09	5.61
3	GE Frame 5 Turbine #251	234 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.379 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00
4	GE Frame 5 Turbine #252	229 MMBtu/hr (LHV)	NG	38.6 MMscf	1,093,546 scm	0.379 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	6.04	6.66
5	GE Frame 5 Turbine #351	156 MMBtu/hr (LHV)	NG	24.2 MMscf	685,640 scm	0.265 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	2.65	2.92
6	GE Frame 5 Turbine #352	156 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.265 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - SoLoNOx	60 MMBtu/hr (LHV)	NG	3.2 MMscf	89,553 scm	0.0282 lb/MMBtu (LHV)	Source Test (19-Jun-2016)	0.04	0.04
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	60 MMBtu/hr (LHV)	NG	0.0 MMscf	5 scm	0.152 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00
8	Erie City 9M Boiler #501	47 MMBtu/hr	NG	49.6 MMscf	1,405,684 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.23	2.46
9	Erie City 9M Boiler #502	47 MMBtu/hr	NG	28.7 MMscf	811,509 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.29	1.42
10	Erie City 9M Boiler #511	46 MMBtu/hr	NG	37.5 MMscf	1,062,001 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.69	1.86
11	Cat D-379 Emergency Generator	350 kW	Diesel	2,444.9 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.65	0.72
12	Cat 3406 FW Pump #2	375 hp	Diesel						
13	Cat 3406 FW Pump #3	375 hp	Diesel						
14	Cat 3306 FW Pump #4	231 hp	Diesel						
15	Ground Flare (including pilot)	148 MMscf/day	NG	273.3 MMscf	7,739,337 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (12/16)	8.52	9.39
N/A	Nonroutine Flaring	148 MMscf/day	NG	4.3 MMscf	123,062 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (12/16)	0.14	0.15
N/A	Nonroutine Venting		N/A	0 MMscf	N/A				
N/A	Routine Venting - Turbine Compressor Seal Oil Degassing Vents		N/A	N/A	N/A				
N/A	Routine Venting - Plant Vent Stack (Boil-Off Gas from LNG Storage Tanks)		N/A	83.3 MMscf	N/A				
16	Routine Venting - Amine Treater Vent	15,300 scf/hr	N/A	216.0 hours	N/A				
17	John Deere 4039 Sullair Compressor #5	78 hp	Diesel	219.2 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.06	0.06
N/A	Small Heaters and Boilers	2.9 MMBtu/hr	NG	28.2 MMscf	797,326 scm	94 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.19	1.31
N/A	Imported Electricity		N/A	9,303,847 kW-hr	N/A				
							Total Nonroutine Emissions	0.14	0.15
							Total Emissions	29.6	32.6
							Total Assessable Emissions		32.6

Fuel	HHV	LHV	Sulfur Content	Density
NG	1011 Btu/scf	910.0 Btu/scf	1.0 ppmv H_2S	----
Diesel	133,269 Btu/gal	---	0.00016 wt% S	6.76 lb/gal

2016 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.032 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
2	GE Frame 5 Turbine #152	0.032 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.57	0.62	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.13	0.14
3	GE Frame 5 Turbine #251	0.010 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
4	GE Frame 5 Turbine #252	0.010 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.16	0.18	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.12	0.13
5	GE Frame 5 Turbine #351	0.043 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.43	0.47	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.07	0.08
6	GE Frame 5 Turbine #352	0.043 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0056 lb/MMBtu (LHV)	Source Test (19-Jun-2016)	0.01	0.01	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.01	0.01
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	5.12 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
8	Erie City 9M Boiler #501	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.87	2.07	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.17	0.19
9	Erie City 9M Boiler #502	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.08	1.19	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.10	0.11
10	Erie City 9M Boiler #511	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.42	1.56	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.13	0.14
11	Cat D-379 Emergency Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.14	0.15	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.05	0.05
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	0.31 lb/MMBtu	AP-42 Table 13.5-2 (12/16)	35.0	38.6	26.47 lb/MMscf	AP-42 Table 13.5-1 (12/16)	3.28	3.62
N/A	Nonroutine Flaring	0.31 lb/MMBtu	AP-42 Table 13.5-2 (12/16)	0.56	0.61	26.47 lb/MMscf	AP-42 Table 13.5-1 (12/16)	0.05	0.06
N/A	Nonroutine Venting								
N/A	Routine Venting - Turbine Compressor Seal Oil Degassing Vents								
N/A	Routine Venting - Plant Vent Stack (Boil-Off Gas from LNG Storage Tanks)								
16	Routine Venting - Amine Treater Vent								
17	John Deere 4039 Sullair Compressor #5	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.004	0.005
N/A	Small Heaters and Boilers	40 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.51	0.56	7.6 lb/MMscf	AP-42 Table 1.4-2	0.10	0.11
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.56	0.61		Total Nonroutine Emissions	0.05	0.06
			Total Emissions	41.7	46.0		Total Emissions	4.2	4.6
			Total Assessable Emissions		46.0		Total Assessable Emissions		0.0

2016 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
2	GE Frame 5 Turbine #152	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.04	0.05	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.003	0.004
3	GE Frame 5 Turbine #251	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
4	GE Frame 5 Turbine #252	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.04	0.04	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.003	0.003
5	GE Frame 5 Turbine #351	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.02	0.03	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.002	0.002
6	GE Frame 5 Turbine #352	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.003	0.003	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
8	Erie City 9M Boiler #501	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.12	0.14	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.004	0.004
9	Erie City 9M Boiler #502	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.07	0.08	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.002	0.002
10	Erie City 9M Boiler #511	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.09	0.10	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.003	0.003
11	Cat D-379 Emergency Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.05	0.05	2.16E-05 lb/gal	Lab Analysis / Mass Balance	0.000	0.000
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	1.37 lb/MMscf	Fuel Gas Composition and Flare Destruction Efficiency of 98%	0.17	0.19	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.021	0.023
N/A	Nonroutine Flaring	1.37 lb/MMscf		0.003	0.003	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.0003	0.0004
N/A	Nonroutine Venting	68.6 lb/MMscf	Fuel Gas Composition	0.00	0.00				
N/A	Routine Venting - Turbine Compressor Seal Oil Degassing Vents	156 tpy	Material balance (based on refrigerant purchases and changes in storage volumes)	141.5	156.0				
N/A	Routine Venting - Plant Vent Stack (Boil-Off Gas from LNG Storage Tanks)	68.6 lb/MMscf	Fuel Gas Composition	2.59	2.86				
16	Routine Venting - Amine Treater Vent								
17	John Deere 4039 Sullair Compressor #5	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.004	0.005	2.16E-05 lb/gal	Lab Analysis / Mass Balance	0.000	0.000
N/A	Small Heaters and Boilers	5.5 lb/MMscf	AP-42 Table 1.4-2	0.07	0.08	0.17 lb/MMscf	Mass Balance	0.002	0.002
N/A	Imported Electricity								
			Total Nonroutine Emissions	0.003	0.003		Total Nonroutine Emissions	0.0003	0.0004
			Total Emissions	144.8	159.6		Total Emissions	0.04	0.04
			Total Assessable Emissions		159.6		Total Assessable Emissions		0.0

Grand Total Assessable Emissions (sum of all pollutants with emissions ≥10 tons) = 238

TESORO

Tesoro Alaska Company LLC
54741 Tesoro Road
P.O. Box 3369
Kenai, AK 99611

March 27, 2018

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue
Juneau, Alaska 99811-1800

Mailed Certified
Receipt No. 7017 0530 0001 1477 4977

RE: Tesoro Alaska Company LLC
Kenai Refinery
Permit No. 035TVP02
2017 Emission Fees Report

To Whom It May Concern:

Tesoro Alaska Company LLC (Tesoro) has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2017 in accordance with 18 AAC 50.410 for Tesoro's Kenai Refinery. Enclosed is one copy of the emission fee report which includes all of the assumptions and calculations used to estimate the assessable emissions. The second copy is being delivered via email.

If you have any questions please contact Michelle Lee of my staff at (907) 776-3594.

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.

Sincerely,

Cameron Hunt
Vice President, Kenai Refinery

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2017 Emission Fee Report

TESORO ALASKA COMPANY
KENAI REFINERY

MARCH 2018

Prepared for:
TESORO ALASKA COMPANY
Kenai, Alaska

•••

Prepared by:
Verdant Environmental
South Pasadena, California

Table 37: Total emissions from the Kenai refinery in 2017

Activity	Pollutant Emissions (tons/year)					
	VOC	NOx	SOx	CO	PM10	Total
Tanks	58.8	0.0	0.0	0.0	0.0	58.8
Component Leaks	40.3	0.0	0.0	0.0	0.0	40.3
Combustion - Boilers and Heaters	22.3	422.7	8.9	315.0	29.4	798.3
Refinery Flare J801	0.5	1.1	0.2	4.8	0.1	6.8
Refinery Flare J801 - Excess Emissions			0.0			
OWSS - Treatment and Storage	12.5	0.0	0.0	0.0	0.0	12.5
OWSS - Drains	0.2					
Material Use	1.1	0.0	0.0	0.0	0.0	1.1
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	3.4	0.0	0.0	3.4
Sulfur Recovery Unit - Excess Emissions			0.0			
Pressure Release Valves	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.02	0.0	0.0	0.0	0.4	0.5
Total	135.7	423.7	12.6	319.9	30.0	921.7

Tesoro Logistics GP, LLC
19100 Ridgewood Parkway
San Antonio, TX 78259
210 626 6000 Phone

March 27, 2018

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Mailed Certified
Receipt No.7017 0530 0001 1477 4922

RE: Kenai LNG Corporation
Permit No. AQ0090TVP02
2017 Emissions Estimate Report

To Whom It May Concern:

Kenai LNG Corporation has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2017 in accordance with 18 AAC 50.410. Enclosed is one copy of the emissions estimate report which includes the estimate basis. A second copy is being submitted electronically.

Please contact Michelle Lee at (907) 776-3594 if you have any questions regarding this report.

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.

Sincerely,

Scott Rosin
Area Manager, Pipelines & Terminals

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2017 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_X			
								Actual Emissions	
ID	Emission Unit Name/ Description	Design Capacity	Fuel / Material	Actual Throughput or Usage	Calculated Throughput (NG fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	168.0 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.288 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
2	GE Frame 5 Turbine #152	168.0 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.288 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
3	GE Frame 5 Turbine #251	228.9 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.379 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00
4	GE Frame 5 Turbine #252	228.9 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.379 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00
5	GE Frame 5 Turbine #351	161.1 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.265 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
6	GE Frame 5 Turbine #352	161.1 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.265 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - SoLoNOx	60.3 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.0282 lb/MMBtu (LHV)	Source Test (19-Jun-2016)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	60.3 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.152 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00
8	Erie City 9M Boiler #501	46.5 MMBtu/hr (LHV)	NG	58.6 MMscf	1,658,838 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.63	2.90
9	Erie City 9M Boiler #502	46.5 MMBtu/hr (LHV)	NG	6.2 MMscf	174,461 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.28	0.31
10	Erie City 9M Boiler #511	46.5 MMBtu/hr (LHV)	NG	27.9 MMscf	789,365 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.25	1.38
11	Cat D-379 Emergency Generator	350 kW	Diesel	2,075 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.55	0.60
12	Cat 3406 FW Pump #2	375 hp	Diesel						
13	Cat 3406 FW Pump #3	375 hp	Diesel						
14	Cat 3306 FW Pump #4	231 hp	Diesel						
15	Ground Flare (including pilot)	148 MMscf/day	NG	164.4 MMscf	4,654,369 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (2/18)	5.13	5.65
---	Nonroutine Flaring	148 MMscf/day	NG / Ethylene / Propane	6.4 MMscf	180,759 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (2/18)	0.37	0.41
---	Nonroutine Venting		Ethylene	0.06 MMscf	N/A	--	--	--	--
16	Routine Venting - Amine Treater Vent	15,300 scf/hr	Vent Gas	0.0 hours	N/A	--	--	--	--
17	John Deere 4039 Sullair Compressor #5	78 hp	Diesel	111.7 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.03	0.03
(18 - 21)[1]	Routine Venting - Propane and Ethylene Compressor Seal Oil Degassing Vents		Propane / Ethylene	0.0 MMscf	N/A	--	--	--	--
(22)[1]	Routine Venting - Boil-Off Gas (BOG) Vent for LNG Storage Tanks		BOG	24.8 MMscf	N/A	--	--	--	--
(23)[1]	Gasoline Storage and Dispensing Tank	1,015 gal	Gasoline	2,864 gal	N/A	--	--	--	--
---	Vehicle Refueling (uncontrolled displacement losses)		Gasoline	2,864 gal	N/A	--	--	--	--
---	Vehicle Refueling (spillage)		Gasoline	2,864 gal	N/A	--	--	--	--
---	Small Heaters and Boilers	2.93 MMBtu/hr (LHV)	NG	28.2 MMscf	797,326 scm	94 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.19	1.31
---	Modine Heater	0.22 MMBtu/hr (HHV)	Propane	8,760 hours	N/A	13 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.12	0.14
---	Imported Electricity		N/A	7,578,026 kW-hr	N/A	--	--	--	--
							Total Nonroutine Emissions	0.37	0.41
							Total Emissions	11.5	12.7
							Total Assessable Emissions		12.7

[1] Proposed EU IDs in the amended LNG Title V Operating Permit renewal application submitted on Aug. 17, 2017.

Fuel	HHV	LHV	Sulfur Content	Density
NG	1,011 Btu/scf	910.0 Btu/scf	1.0 ppmv H_2S	----
Diesel	131,990 Btu/gal	---	0.000060 wt% S	6.7 lb/gal
Propane	91,500 Btu/gal	84,206 Btu/gal	0.0185 wt% S	4.24 lb/gal

2017 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.032 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
2	GE Frame 5 Turbine #152	0.032 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
3	GE Frame 5 Turbine #251	0.010 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
4	GE Frame 5 Turbine #252	0.010 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
5	GE Frame 5 Turbine #351	0.043 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
6	GE Frame 5 Turbine #352	0.043 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0056 lb/MMBtu (LHV)	Source Test (19-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	5.12 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
8	Erie City 9M Boiler #501	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.21	2.44	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.20	0.22
9	Erie City 9M Boiler #502	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.23	0.26	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.02	0.02
10	Erie City 9M Boiler #511	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.05	1.16	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.10	0.10
11	Cat D-379 Emergency Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.12	0.13	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.04	0.04
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	0.31 lb/MMBtu	AP-42 Table 13.5-2 (2/18)	21.0	23.2	26.47 lb/MMscf	AP-42 Table 13.5-1 (2/18)	1.97	2.18
---	Nonroutine Flaring	0.31 lb/MMBtu	AP-42 Table 13.5-2 (2/18)	1.56	1.72	26.47 lb/MMscf	AP-42 Table 13.5-1 (2/18)	0.08	0.08
---	Nonroutine Venting	--	--	--	--	--	--	--	--
16	Routine Venting - Amine Treater Vent	--	--	--	--	--	--	--	--
17	John Deere 4039 Sullair Compressor #5	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.002	0.002
(18 - 21)[1]	Routine Venting - Propane and Ethylene Compressor Seal Oil Degassing Vents	--	--	--	--	--	--	--	--
(22)[1]	Routine Venting - Boil-Off Gas (BOG) Vent for LNG Storage Tanks	--	--	--	--	--	--	--	--
(23)[1]	Gasoline Storage and Dispensing Tank	--	--	--	--	--	--	--	--
---	Vehicle Refueling (uncontrolled displacement losses)	--	--	--	--	--	--	--	--
---	Vehicle Refueling (spillage)	--	--	--	--	--	--	--	--
---	Small Heaters and Boilers	40 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.51	0.56	7.6 lb/MMscf	AP-42 Table 1.4-2	0.10	0.11
---	Modine Heater	7.5 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.07	0.08	0.7 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.01	0.01
---	Imported Electricity	--	--	--	--	--	--	--	--
			Total Nonroutine Emissions	1.6	1.7		Total Nonroutine Emissions	0.08	0.08
			Total Emissions	26.8	29.5		Total Emissions	2.5	2.8
			Total Assessable Emissions		29.5		Total Assessable Emissions		0.0

[1] Proposed EU IDs in the amended LNG Title V Operating Permit renewal application submitted on Aug. 17, 2017.

2017 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
2	GE Frame 5 Turbine #152	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
3	GE Frame 5 Turbine #251	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
4	GE Frame 5 Turbine #252	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
5	GE Frame 5 Turbine #351	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
6	GE Frame 5 Turbine #352	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
8	Erie City 9M Boiler #501	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.14	0.16	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.004	0.005
9	Erie City 9M Boiler #502	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.02	0.02	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.001
10	Erie City 9M Boiler #511	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.07	0.08	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.002	0.002
11	Cat D-379 Emergency Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.04	0.04	8.04E-06 lb/gal	Lab Analysis / Mass Balance	7.57E-06	8.34E-06
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	1.37 lb/MMscf	Fuel Gas Composition and Flare Destruction Efficiency of 98%	0.10	0.11	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.013	0.014
---	Nonroutine Flaring	1,676 lb/MMscf	Gas Composition and Flare Destruction Efficiency of 98%	4.85	5.35	0.01 lb/MMscf	Lab Analysis / Mass Balance	2.47E-05	2.73E-05
---	Nonroutine Venting	73,879 lb/MMscf	Based on Refrigerant (Ethylene) Properties	1.89	2.09	--	--	--	--
16	Routine Venting - Amine Treater Vent	--	--	--	--	--	--	--	--
17	John Deere 4039 Sullair Compressor #5	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.002	0.002	8.04E-06 lb/gal	Lab Analysis / Mass Balance	4.07E-07	4.49E-07
(18 - 21)[1]	Routine Venting - Propane and Ethylene Compressor Seal Oil Degassing Vents	--	Material balance (based on refrigerant purchases and changes in storage volumes)	0.00	0.00	--	--	--	--
(22)[1]	Routine Venting - Boil-Off Gas (BOG) Vent for LNG Storage Tanks	68.6 lb/MMscf	Fuel Gas Composition	0.77	0.85	--	--	--	--
(23)[1]	Gasoline Storage and Dispensing Tank	--	TANKS 4.09d software	0.03	0.03	--	--	--	--
---	Vehicle Refueling (uncontrolled displacement losses)	11.0 lb/kgal	AP-42 Table 5.2-7 (6/08)	0.01	0.02	--	--	--	--
---	Vehicle Refueling (spillage)	0.7 lb/kgal	AP-42 Table 5.2-7 (6/08)	0.001	0.001	--	--	--	--
---	Small Heaters and Boilers	5.5 lb/MMscf	AP-42 Table 1.4-2	0.07	0.08	0.17 lb/MMscf	Mass Balance	0.002	0.002
---	Modine Heater	1.0 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.01	0.01	0.017 lb/MMBtu	Mass Balance	0.015	0.017
---	Imported Electricity	--	--	--	--	--	--	--	--
			Total Nonroutine Emissions	6.7	7.4		Total Nonroutine Emissions	0.00	0.00
			Total Emissions	8.0	8.8		Total Emissions	0.04	0.04
			Total Assessable Emissions		0.0		Total Assessable Emissions		0.0

[1] Proposed EU IDs in the amended LNG Title V Operating Permit renewal application submitted on Aug. 17, 2017.

Grand Total Assessable Emissions (sum of all pollutants with emissions ≥10 tons) = 42

TESORO

Tesoro Alaska Company LLC
54741 Tesoro Road
P.O. Box 3369
Kenai, AK 99611

March 27, 2018

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue
Juneau, Alaska 99811-1800

Mailed Certified
Receipt No. 7017 0530 0001 1477 4977

RE: Tesoro Alaska Company LLC
Kenai Refinery
Permit No. 035TVP02
2017 Emission Fees Report

To Whom It May Concern:

Tesoro Alaska Company LLC (Tesoro) has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2017 in accordance with 18 AAC 50.410 for Tesoro's Kenai Refinery. Enclosed is one copy of the emission fee report which includes all of the assumptions and calculations used to estimate the assessable emissions. The second copy is being delivered via email.

If you have any questions please contact Michelle Lee of my staff at (907) 776-3594.

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.

Sincerely,

Cameron Hunt
Vice President, Kenai Refinery

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2017 Emission Fee Report

TESORO ALASKA COMPANY
KENAI REFINERY

MARCH 2018

Prepared for:
TESORO ALASKA COMPANY
Kenai, Alaska

•••

Prepared by:
Verdant Environmental
South Pasadena, California

Table 37: Total emissions from the Kenai refinery in 2017

Activity	Pollutant Emissions (tons/year)					
	VOC	NOx	SOx	CO	PM10	Total
Tanks	58.8	0.0	0.0	0.0	0.0	58.8
Component Leaks	40.3	0.0	0.0	0.0	0.0	40.3
Combustion - Boilers and Heaters	22.3	422.7	8.9	315.0	29.4	798.3
Refinery Flare J801	0.5	1.1	0.2	4.8	0.1	6.8
Refinery Flare J801 - Excess Emissions			0.0			
OWSS - Treatment and Storage	12.5	0.0	0.0	0.0	0.0	12.5
OWSS - Drains	0.2					
Material Use	1.1	0.0	0.0	0.0	0.0	1.1
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	3.4	0.0	0.0	3.4
Sulfur Recovery Unit - Excess Emissions			0.0			
Pressure Release Valves	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.02	0.0	0.0	0.0	0.4	0.5
Total	135.7	423.7	12.6	319.9	30.0	921.7

Tesoro Logistics GP, LLC
19100 Ridgewood Parkway
San Antonio, TX 78259
210 626 6000 Phone

March 29, 2019

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99801-1795

Mailed Certified
Receipt No.7018 1830 0001 5870 2946

RE: Kenai LNG Corporation
Permit No. AQ0090TVP02
2018 Emissions Estimate Report

To Whom It May Concern:

Kenai LNG Corporation has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2018 in accordance with 18 AAC 50.410. Enclosed is one copy of the emissions estimate report which includes the estimate basis. A second copy is being submitted electronically.

Please contact Micheal Harper at (907) 776-3599 if you have any questions regarding this report.

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.

Sincerely,

Scott Rosin
Area Manager, Pipelines & Terminals

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2018 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail			Operating Information			Nitrogen Oxides - NO_x			
								Actual Emissions	
ID	Emission Unit Name/ Description	Design Capacity	Fuel / Material	Actual Throughput or Usage	Calculated Throughput (NG fired Units)	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	168.0 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.288 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
2	GE Frame 5 Turbine #152	168.0 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.288 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
3	GE Frame 5 Turbine #251	228.9 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.379 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00
4	GE Frame 5 Turbine #252	228.9 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.379 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00
5	GE Frame 5 Turbine #351	161.1 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.265 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
6	GE Frame 5 Turbine #352	161.1 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.265 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - SoLoNOx	60.3 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.0282 lb/MMBtu (LHV)	Source Test (19-Jun-2016)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	60.3 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	0.152 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00
8	Erie City 9M Boiler #501	46.5 MMBtu/hr (LHV)	NG	13.6 MMscf	386,310 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.61	0.68
9	Erie City 9M Boiler #502	46.5 MMBtu/hr (LHV)	NG	0.0 MMscf	0 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.00	0.00
10	Erie City 9M Boiler #511	46.5 MMBtu/hr (LHV)	NG	50.8 MMscf	1,437,294 scm	100 lb/MMscf	AP-42 Table 1.4-1 (7/98)	2.28	2.52
11	Cat D-379 Emergency Generator	350 kW	Diesel	2,127 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.56	0.62
12	Cat 3406 FW Pump #2	375 hp	Diesel						
13	Cat 3406 FW Pump #3	375 hp	Diesel						
14	Cat 3306 FW Pump #4	231 hp	Diesel						
15	Ground Flare (including pilot)	148 MMscf/day	NG	0.0 MMscf	0 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (2/18)	0.00	0.00
---	Nonroutine Flaring	148 MMscf/day	NG / Ethylene / Propane	0.0 MMscf	0 scm	0.068 lb/MMBtu	AP-42 Table 13.5-1 (2/18)	0.00	0.00
16	Routine Venting - Amine Treater Vent	0 scf/hr	Vent Gas	0.0 hours	N/A	--	--	--	--
17	John Deere 4039 Sullair Compressor #5	78 hp	Diesel	109.6 gal	N/A	4.41 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.03	0.03
(18 - 21)[1]	Routine Venting - Propane and Ethylene Compressor Seal Oil Degassing Vents		Propane / Ethylene	0.0 MMscf	N/A	--	--	--	--
(22)[1]	Routine Venting - Boil-Off Gas (BOG) Vent for LNG Storage Tanks		BOG	0.0 MMscf	N/A	--	--	--	--
(23)[1]	Gasoline Storage and Dispensing Tank	1,015 gal	Gasoline	892 gal	N/A	--	--	--	--
---	Vehicle Refueling (uncontrolled displacement losses)		Gasoline	892 gal	N/A	--	--	--	--
---	Vehicle Refueling (spillage)		Gasoline	892 gal	N/A	--	--	--	--
---	Small Heaters and Boilers	2.93 MMBtu/hr (LHV)	NG	1.3 MMscf	37,673 scm	94 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.19	1.31
---	Modine Heater	0.22 MMBtu/hr (HHV)	Propane	8,760 hours	N/A	13 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.12	0.14
---	Imported Electricity		N/A	7,578,026 kW-hr	N/A	--	--	--	--
							Total Nonroutine Emissions	0.00	0.00
							Total Emissions	4.8	5.3
							Total Assessable Emissions		0.0

[1] Proposed EU IDs in the amended LNG Title V Operating Permit renewal application submitted on Aug. 17, 2017.

Fuel	HHV	LHV	Sulfur Content	Density
NG	1,011 Btu/scf	910.0 Btu/scf	1.0 ppmv H_2S	----
Diesel	131,990 Btu/gal	---	0.000060 wt% S	6.7 lb/gal
Propane	91,500 Btu/gal	84,206 Btu/gal	0.0185 wt% S	4.24 lb/gal

2018 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Carbon Monoxide - CO				Particulate Matter less than 10 Microns - PM_{10}			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.032 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
2	GE Frame 5 Turbine #152	0.032 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
3	GE Frame 5 Turbine #251	0.010 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
4	GE Frame 5 Turbine #252	0.010 lb/MMBtu (LHV)	Source Test (21-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
5	GE Frame 5 Turbine #351	0.043 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
6	GE Frame 5 Turbine #352	0.043 lb/MMBtu (LHV)	Source Test (20-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0056 lb/MMBtu (LHV)	Source Test (19-Jun-2016)	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	5.12 lb/MMBtu (LHV)	2007 Source Test	0.00	0.00	0.0066 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00
8	Erie City 9M Boiler #501	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.52	0.57	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.05	0.05
9	Erie City 9M Boiler #502	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.00	0.00	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.00	0.00
10	Erie City 9M Boiler #511	84 lb/MMscf	AP-42 Table 1.4-1 (7/98)	1.92	2.11	7.6 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.17	0.19
11	Cat D-379 Emergency Generator	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.12	0.13	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.04	0.04
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	0.31 lb/MMBtu	AP-42 Table 13.5-2 (2/18)	0.0	0.0	26.47 lb/MMscf	AP-42 Table 13.5-1 (2/18)	0.00	0.00
---	Nonroutine Flaring	0.31 lb/MMBtu	AP-42 Table 13.5-2 (2/18)	0.00	0.00	26.47 lb/MMscf	AP-42 Table 13.5-1 (2/18)	0.00	0.00
16	Routine Venting - Amine Treater Vent	--	--	--	--	--	--	--	--
17	John Deere 4039 Sullair Compressor #5	0.95 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.01	0.01	0.31 lb/MMBtu	AP-42 Table 3.3-1 (10/96)	0.002	0.002
(18 - 21)[1]	Routine Venting - Propane and Ethylene Compressor Seal Oil Degassing Vents	--	--	--	--	--	--	--	--
(22)[1]	Routine Venting - Boil-Off Gas (BOG) Vent for LNG Storage Tanks	--	--	--	--	--	--	--	--
(23)[1]	Gasoline Storage and Dispensing Tank	--	--	--	--	--	--	--	--
---	Vehicle Refueling (uncontrolled displacement losses)	--	--	--	--	--	--	--	--
---	Vehicle Refueling (spillage)	--	--	--	--	--	--	--	--
---	Small Heaters and Boilers	40 lb/MMscf	AP-42 Table 1.4-1 (7/98)	0.51	0.56	7.6 lb/MMscf	AP-42 Table 1.4-2	0.10	0.11
---	Modine Heater	7.5 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.07	0.08	0.7 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.01	0.01
---	Imported Electricity	--	--	--	--	--	--	--	--
			Total Nonroutine Emissions	0.0	0.0		Total Nonroutine Emissions	0.00	0.00
			Total Emissions	3.1	3.5		Total Emissions	0.4	0.4
			Total Assessable Emissions		0.0		Total Assessable Emissions		0.0

[1] Proposed EU IDs in the amended LNG Title V Operating Permit renewal application submitted on Aug. 17, 2017.

2018 Assessable Emissions Estimate
Permit No. AQ0090TVP02
Kenai LNG Plant

Unit Equipment Detail		Volatile Organic Compounds - VOC				Sulfur Dioxide - SO_2			
				Actual Emissions				Actual Emissions	
ID	Emission Unit Name/ Description	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons	Emission Factor	EF Reference	Metric Tonnes	U.S. Tons
1	GE Frame 5 Turbine #151	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
2	GE Frame 5 Turbine #152	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
3	GE Frame 5 Turbine #251	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
4	GE Frame 5 Turbine #252	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
5	GE Frame 5 Turbine #351	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
6	GE Frame 5 Turbine #352	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
7	Solar Taurus 60 Turbine #701 - SoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
7	Solar Taurus 60 Turbine #701 - NonSoLoNOx	0.0021 lb/MMBtu	AP-42 Table 3.1-2a (4/00)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
8	Erie City 9M Boiler #501	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.03	0.04	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.001	0.001
9	Erie City 9M Boiler #502	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
10	Erie City 9M Boiler #511	5.5 lb/MMscf	AP-42 Table 1.4-2 (7/98)	0.13	0.14	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.004	0.004
11	Cat D-379 Emergency Generator	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.04	0.05	8.04E-06 lb/gal	Lab Analysis / Mass Balance	7.76E-06	8.55E-06
12	Cat 3406 FW Pump #2								
13	Cat 3406 FW Pump #3								
14	Cat 3306 FW Pump #4								
15	Ground Flare (including pilot)	1.37 lb/MMscf	Fuel Gas Composition and Flare Destruction Efficiency of 98%	0.00	0.00	0.17 lb/MMscf	Lab Analysis / Mass Balance	0.000	0.000
---	Nonroutine Flaring	0 lb/MMscf	Gas Composition and Flare Destruction Efficiency of 98%	0.00	0.00	0.00 lb/MMscf	Lab Analysis / Mass Balance	0.00E+00	0.00E+00
16	Routine Venting - Amine Treater Vent	--	--	--	--	--	--	--	--
17	John Deere 4039 Sullair Compressor #5	0.324 lb/MMBtu	AP-42 Table 3.3-1 (10/96) Assume VOC is 90% of TOC	0.002	0.002	8.04E-06 lb/gal	Lab Analysis / Mass Balance	4.00E-07	4.41E-07
(18 - 21)[1]	Routine Venting - Propane and Ethylene Compressor Seal Oil Degassing Vents	--	Material balance (based on refrigerant purchases and changes in storage volumes)	0.00	0.00	--	--	--	--
(22)[1]	Routine Venting - Boil-Off Gas (BOG) Vent for LNG Storage Tanks	68.6 lb/MMscf	Fuel Gas Composition	0.00	0.00	--	--	--	--
(23)[1]	Gasoline Storage and Dispensing Tank	--	TANKS 4.09d software	0.03	0.03	--	--	--	--
---	Vehicle Refueling (uncontrolled displacement losses)	11.0 lb/kgal	AP-42 Table 5.2-7 (6/08)	0.00	0.00	--	--	--	--
---	Vehicle Refueling (spillage)	0.7 lb/kgal	AP-42 Table 5.2-7 (6/08)	0.000	0.000	--	--	--	--
---	Small Heaters and Boilers	5.5 lb/MMscf	AP-42 Table 1.4-2	0.07	0.08	0.17 lb/MMscf	Mass Balance	0.000	0.000
---	Modine Heater	1.0 lb/kgal	AP-42 Table 1.5-1 (7/08)	0.01	0.01	0.017 lb/MMBtu	Mass Balance	0.015	0.017
---	Imported Electricity	--	--	--	--	--	--	--	--
			Total Nonroutine Emissions	0.0	0.0		Total Nonroutine Emissions	0.00	0.00
			Total Emissions	0.3	0.4		Total Emissions	0.02	0.02
			Total Assessable Emissions		0.0		Total Assessable Emissions		0.0

[1] Proposed EU IDs in the amended LNG Title V Operating Permit renewal application submitted on Aug. 17, 2017.

Grand Total Assessable Emissions (sum of all pollutants with emissions ≥10 tons) = 0

TESORO
Tesoro Alaska Company
P.O. Box 3369
Kenai, AK 99611-3369
907 776 8191
907 776 5546 Fax

March 28, 2019

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue
Juneau, Alaska 99811-1800

Mailed Certified
Receipt No. 7018 1830 0001 5870 2915

RE: Tesoro Alaska Company LLC
Kenai Refinery
Permit No. 035TVP02
2018 Emission Fees Report

To Whom It May Concern:

Tesoro Alaska Company LLC (Tesoro) has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2018 in accordance with 18 AAC 50.410 for Tesoro's Kenai Refinery. Enclosed is one copy of the emission fee report which includes all of the assumptions and calculations used to estimate the assessable emissions. The second copy is being delivered via email.

If you have any questions, please contact Micheal Harper of my staff at (907) 776-3599.

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.

Sincerely,

Cameron Hunt
Vice President, Kenai Refinery

Enclosure

cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2018 Emission Fee Report

TESORO ALASKA COMPANY

KENAI REFINERY

MARCH 2019

Prepared for:

TESORO ALASKA COMPANY

Kenai, Alaska

•••

Prepared by:

Verdant Environmental

South Pasadena, California

Table 37: Total emissions from the Kenai refinery in 2018

Activity	Pollutant Emissions (tons/year)					
	VOC	NOx	SOx	CO	PM10	Total
Tanks	82.7	0.0	0.0	0.0	0.0	82.7
Component Leaks	41.8	0.0	0.0	0.0	0.0	41.8
Combustion - Boilers and Heaters	21.6	404.6	9.3	299.8	28.5	763.8
Refinery Flare J801	0.2	0.8	0.1	3.6	0.1	4.8
Refinery Flare J801 - Excess Emissions			0.0			
OWSS - Treatment and Storage	12.5	0.0	0.0	0.0	0.0	12.5
OWSS - Drains	0.2					
Material Use	0.2	0.0	0.0	0.0	0.0	0.2
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	4.6	0.0	0.0	4.6
Sulfur Recovery Unit - Excess Emissions			0.0			
Pressure Release Valves	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.02	0.0	0.0	0.0	0.4	0.5
Total	159.2	405.4	14.0	303.4	29.1	910.9

2019 EMISSION FEE REPORT

Kenai Liquified Natural Gas

MARCH 2020

Prepared for:
Kenai LNG LLC
Kenai, Alaska

•••

Prepared by:
Verdant Environmental
South Pasadena, California

Table 17: Summary of emissions in 2019

Activity	Pollutant Emissions (tons/year)					
	NOx	SOx	CO	PM10	VOC	Total
Compressors	0.00	0.00	0.00	0.00	0.00	0.00
Boilers	4.16	0.01	3.49	0.32	0.23	8.20
IC Engines	0.69	0.00	0.15	0.05	0.05	0.94
Heaters	0.09	0.00	0.04	0.01	0.01	0.15
Ground Flare	0.00	0.00	0.00	0.00	0.00	0.00
Routine Venting					0.00	0.00
Gasoline dispensing					0.00	0.00
Total	4.94	0.01	3.68	0.37	0.28	9.29

Tesoro Alaska Company LLC

Kenai Refinery
54741 Tesoro Road
Kenai, AK 99611
Tel: 907-776-8191

March 30, 2020

Alaska Department of Environmental Conservation
Air Permits Program
ATTN: Assessable Emissions Estimate
410 Willoughby Avenue
Juneau, Alaska 99811-1800

RE: Tesoro Alaska Company LLC
Kenai Refinery
Permit No. 035TVP02
2019 Emission Fees Report

To Whom It May Concern:

Tesoro Alaska Company LLC (Tesoro) has assessed the projected annual rate of emissions based on actual emissions calculated for the calendar year 2019 in accordance with 18 AAC 50.410 for Tesoro's Kenai Refinery. Enclosed is one copy of the emission fee report which includes all the assumptions and calculations used to estimate the assessable emissions. The second copy is being delivered via email.

A summary of 2019 emissions is provided in the table below.

Activity	**Pollutant Emissions (tons/year)**					
	VOC	**NOx**	**SOx**	**CO**	**PM10**	**Total**
Tanks	144.0	0.0	0.0	0.0	0.0	144.0
Component Leaks	41.7	0.0	0.0	0.0	0.0	41.7
Combustion - Boilers and Heaters	21.6	397.8	8.0	304.8	28.9	761.1
Refinery Flare J801	0.9	1.0	1.6	4.7	0.1	8.2
Refinery Flare J801 - Excess Emissions			0.0			
OWSS - Treatment and Storage	12.5	0.0	0.0	0.0	0.0	12.5
OWSS - Drains	0.2					
Material Use	0.2	0.0	0.0	0.0	0.0	0.2
Remediation Systems	0.0	0.0	0.0	0.0	0.0	0.0
Sulfur Recovery Unit	0.0	0.0	4.3	0.0	0.0	4.3

Sulfur Recovery Unit - Excess Emissions			0.1			
Pressure Release Valves	0.0	0.0	0.0	0.0	0.0	0.0
Cooling Tower	0.1	0.0	0.0	0.0	0.4	0.6
Total	221.1	398.8	14.0	309.5	29.5	972.6

If you have any questions, please contact Leah Vik of my staff at (907) 776-3819.

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.

Sincerely,

Cameron Hunt
General Manager, Kenai Refinery

Enclosure – 2019 Emission Fee Report
cc: Second copy submitted via email to DEC.AQ.airreports@alaska.gov

2020 Emission Fee Report

Kenai Liquified Natural Gas

MARCH 2021

Table 17: Summary of emissions in 2020

Activity	Pollutant Emissions (tons/year)					
	NOx	SOx	CO	PM10	VOC	Total
Compressors	0.00	0.00	0.00	0.00	0.00	0.00
Boilers	3.66	0.01	3.08	0.28	0.20	7.22
IC Engines	0.62	0.00	0.13	0.04	0.05	0.85
Heaters	0.72	0.00	0.31	0.06	0.04	1.13
Ground Flare	0.00	0.00	0.00	0.00	0.00	0.00
Routine Venting					0.00	0.00
Gasoline dispensing					0.00	0.00
Total	5.00	0.01	3.52	0.38	0.29	9.20

BlueCrest Alaska Operating LLC
3301 C Street, Suite 202
Anchorage, AK 99503

March 29, 2021

ADEC AIR QUALITY
RECEIVED
MAR 30 2021
ANCHORAGE

Alaska Department of Environmental Conservation
Division of Air Quality
555 Cordova Street
Anchorage, Alaska 99501
ATTN: Assessable Emissions Estimate

Subject : **Fiscal Year 2022 Assessable Emissions**
BlueCrest Alaska Operating, LLC – Cosmopolitan Project
Air Quality Minor Permit AQ1385MSS04

To Whom It May Concern,

BlueCrest Alaska Operating, LLC (BlueCrest) is submitting the enclosed assessable emissions estimate for the Cosmopolitan Project to the Alaska Department of Environmental Conservation (ADEC) per Minor Air Quality Permit No. AQ1385MSS04, Condition 4. Calculations and supporting information used to project the annual rate of emissions for the Cosmopolitan Project during the ADEC Fiscal Year (FY) 2022 are based upon actual emissions from January 1, 2020 through December 31, 2020 and are attached. BlueCrest has not installed the equipment authorized under Minor Air Quality Permit No. AQ1385MSS04 that would trigger the requirement to obtain an operating permit under AS.46.14.130(b). As a result, BlueCrest believes per 18 AAC 50.410(b) and AS 46.14.265, the emissions fee of $9.79 per ton should be used to determine the emissions fees for the FY2022 Assessable Emissions for the Cosmopolitan Project.

If you have questions or need additional information regarding the submitted emission estimates, please feel free to contact Jacki Rose at (907) 754-9558 or via e-mail at jrose@bluecrestenergy.com.

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.

Sincerely,

Geoff Merrell
HSE Manager
BlueCrest Alaska Operating, LLC

Enclosure: FY2022 Assessable Emissions

cc: Jacki Rose, BlueCrest
Chelsea Normand, Boreal Environmental Services

Table 1. FY2022 Assessable Emissions Estimate Summary
BlueCrest Alaska Operating, LLC Cosmopolitan Project Minor Air Quality Permit AQ1385MSS04

	FY2022 Projected Annual Assessable Emissions Rate (tpy)[1]				
	NO_X	CO	PM_{10}	VOC	SO_2
Annual Assessable Emissions Rate	36.8	57.7	6.8	20.4	0.1
Fees apply to pollutant?	**Yes**	**Yes**	**No**	**Yes**	**No**
Total Assessable Emissions[2]	**115.0**				
Emission Fee[3] ($/ton)	**$9.79**				
Estimated Fees	**$1,125.85**				

Notes:

[1] Regulated air pollutant calculations are based on AP-42 emission factors, manufacturer data, and mass balances as shown in accompanying emission tables.

[2] Fees paid on each pollutant emitted in quantities greater than 10 tpy per 18 AAC 50.410.

[3] The applicable assessable emission fee is $9.79 per ton, per 18 AAC 50.410(b)(2).

Alaska Department of Environmental Conservation

Amendments to:
State Air Quality Control Plan Volume III: Appendix III.K.8

Alaska Enhanced Smoke Management Plan

Appendix to Section III. K: Areawide Pollutant Control Program for Regional Haze

Final

December 1, 2021

Mike Dunleavy, Governor

Jason W. Brune, Commissioner

Alaska
Enhanced Smoke Management Plan for Planned Fire

Procedures Manual

December 1, 2021

Prepared by:

Department of Environmental Conservation Division of Air Quality
with the Air Quality & Smoke Management Committee for the Alaska Wildland Fire Coordinating Group

ALASKA ENHANCED SMOKE MANAGEMENT PLAN

Contents

1. INTRODUCTION

The Alaska Department of Environmental Conservation (DEC) in coordination with the Alaska Wildland Fire Coordinating Group (AWFCG) has led the development of Alaska's Enhanced Smoke Management Plan (ESMP). The ESMP and accompanying volume of appendices has been adopted by DEC and participating wildland owners and managers through a Memorandum of Understanding (MOU).

This document is an updated version of the previous plan, which was approved in June 2015, and fulfills the U.S. Environmental Protection Agency (EPA) requirement, as outlined in the Interim Policy on Wildland and Prescribed fires, to review the ESMP every five years. The 2015 version of the ESMP was included as a component of the Alaska Regional Haze State Implementation Plan (RH SIP)

The ESMP provides accurate and reliable guidance and direction to and from not only the fire authorities who use prescribed fire as a resource management tool but also to the private landowners and corporations who conduct land clearing burns. This ESMP describes and clarifies the relationship between fire authorities and DEC. These agencies must work together effectively to combine planned burning, resource management, and development with smoke, and public health with Class I area visibility goals.

The ESMP Appendices provide additional assistance for interagency sharing of information, the applicability and availability of current smoke management techniques, monitoring protocol, public education strategies, and emission reduction techniques. The ESMP Appendices include up-to-date techniques and tools (e.g. monitoring equipment, modeling, emission factors) available through the Western Regional Air Partnership (WRAP) and member organizations tasked with assisting states, tribes, and land managers with smoke management.

Alaska's ESMP will be evaluated annually by the AWFCG and interested parties and revised at least every 5 years in accordance with EPA's Interim Policy on Wildland and Prescribed fires. The ESMP appendices will be updated as new information becomes available, but not more often than once a year.

2. REGULATORY PURPOSE

The ESMP helps fulfill Alaska's responsibilities for protection of air quality and human health under federal and state law and reflects the Clean Air Act (CAA) requirement to improve regional haze in Alaska's Class I areas. The Regional Haze Rule (RH Rule) requires that visibility at Class I areas be returned to natural background conditions by 2064. Alaska adopted its first State Implementation Plan (SIP) for regional haze on February 11, 2011. EPA published its final approval of the plan in the Federal Register on January 7, 2013. The next RH SIP is currently due July 31, 2021. The updates in this plan include requirements from the January 10, 2017, RH update, and the 2016 EPA amendment to the Exceptional Events Rule (October 3, 2016) and associated guidance.[1]

[1] Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations, August 8, 2019 (https://www.epa.gov/air-quality-analysis/exceptional-events-guidance-prescribed-fire-wildland-may-influence-ozone-and)

Future updates to this smoke management plan may be necessary to address additional fire tracking and emission management needs based upon policies and guidelines. Updates will be incorporated into the next RH SIP update, as will any future updates to the ESMP.

This ESMP update also addresses the Exceptional Event guidance for Exceptional Events Rule signed on September 16, 2016, and the Exceptional Events Rule Guidance - Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations, August 8, 2019.

Adoption of this document enables the state to certify to the EPA that we are implementing a smoke management plan that addresses elements of the EPA's Interim Air Quality Policy on Wildland and Prescribed Fire, April 23, 1998 (EPA's Interim Policy). If states do not certify that a basic smoke management plan is being implemented, EPA will not provide special consideration to particulate matter (PM) health standard violations attributed to fires managed for resource benefits. According to EPA's policy, a state adopted ESMP enables EPA to use its discretion in deciding to reclassify an area as nonattainment when fires cause or contribute to PM air quality violations. If EPA does indeed reclassify an area, then states need to review the adequacy of their ESMP to make appropriate improvements in cooperation with wildland owners and managers.

Alaska Wildfire Coordinating Group (AWFCG) Guidelines, Membership Criteria and Responsibilities

The AWFCG, formed in 1994 through the consolidation of the Alaska Multi-Agency Coordinating Group and the Alaska Interagency Fire Management Council, provides a forum that fosters cooperation, coordination, and communication for wildland fire and for planning and implementing interagency fire management statewide. The AWFCG membership includes state, federal, municipal and native land management agencies and owners that have fire management responsibilities (Appendix A).

One of the objectives of the AWFCG Air Quality and Smoke Management subcommittee is to provide a forum for anticipating smoke intrusions, resolving on-going smoke management issues, and improving smoke management techniques. Another objective is to ensure that prescribed fire, as a tool to reduce risk and future smoke emissions, is considered by DEC when promulgating policy, procedures, and regulations.

The AWFCG establishes committees and workgroups to address specific issues. Since smoke management is a critical and continuous issue in statewide fire management, the AWFCG established the Smoke Management and Air Quality Committee (AQ Committee). The purpose of the committee is to address the AWFCG smoke management objectives; assist DEC with the development and revision of the Alaska ESMP for prescribed fire; and to disseminate policies, procedures, and regulations related to smoke management. AWFCG members may provide representatives to serve on the AQ Committee. Participation is not mandatory. The DEC representative serves as Committee Chair. Each agency or organization representative is the point of contact for communicating information between the AQ Committee and their agency or organization. The agency or organization representatives are responsible for assisting agency or organization personnel with pre-season permit applications and post-season reporting. The responsibilities of the AQ Committee include assisting in development of the ESMP and reviewing the effectiveness of the plan. An annual fire emissions report has been prepared by

DEC with the AQ Committee for submittal and approval to the AWFCG since 2009.

DEC also participates in the Fire Education and Prevention Committee which is responsible for interagency coordination and development of fire prevention and education materials. This committee works together to manage public messaging and provides an opportunity for smoke management and air quality message development.

The following elements of the ESMP will be reviewed by DEC on an annual basis to determine if plan revisions are needed:

- Implementation and agency coordination
- Burn activity summary
- Smoke complaint summaries
- Compliance and enforcement
- Scientific and technological advancements
- Sections needing clarification and improvement
- Recommendation for revisions

Changes to DEC's open burn regulations (18 AAC 50) may occur if DEC deems it necessary. All changes to state regulations must follow standard procedure, including a public comment period. Regulatory changes that affect prescribed burning in the state will be done in coordination with the AWFCG members and any other affected parties. It will be up to DEC to ensure that stakeholders are informed of any anticipated changes. The current DEC regulations and Open Burning Policy and Guidelines are contained in Appendix B. Changes to the ESMP MOU document can only be made after contacting each signatory in writing.

Enhanced Smoke Management Plan

The purpose of the ESMP is to provide a clear and equitable regulatory basis for smoke management in Alaska. DEC is responsible for protecting the health and welfare of Alaskans from the impacts of smoke from fire as well as protecting visibility according to federal RH rules. The ESMP assists DEC in meeting these requirements. In order to ensure the ESMP is successful, DEC is responsible for the following:

- Developing and implementing the ESMP.
- Reviewing controlled burn approval applications to ensure they comply with state air quality regulations (18 AAC 50.065) and ESMP guidelines and issue approvals.
- Collecting, reviewing, tracking and summarizing statewide pre- and post-burn data for triennial ESMP emission inventory reports to be distributed to AWFCG, EPA (on a triennial basis), and the public.
- Ensuring that field oversight and enforcement is conducted and is uniformly applied.
- Coordinating with the AQ Committee members to establish and facilitate support for smoke management techniques and mitigation strategies within the state.
- Ensuring that the ESMP is understood and communicated to all land management agencies and the AWFCG.
- Facilitating AQ Committee meetings to evaluate the program effectiveness, review policies, discuss new smoke management methods, approve air quality reports to be submitted to the AWFCG for approval, and help solve agency smoke management issues

DEC staff will notify health authorities, news media, the public-at-large, land management agencies, and all other appropriate agencies when unacceptable limits of smoke accumulation are approached or exceeded. DEC staff will restrict implementation of controlled burn approvals in specific areas, request burn suppression actions, or request air quality burn bans or restrictions when meteorological or existing air quality conditions so warrant (i.e., if weather forecasters predict undesirable wind conditions and/or smoke is drifting into sensitive areas).

2.1 ESMP Requirements

EPA Exceptional event regulations[2] and guidance[3] requires the following elements to be included in a state smoke management plan:

1. authorization to burn,
2. smoke management components of burn plans,
3. minimizing air pollutant emissions,
4. public education and awareness,
5. surveillance and enforcement, and
6. program evaluation.

2.2 Authorization to Burn

Under state regulation, all agencies, corporations, and individuals that burn areas larger than forty acres of land a year, whether slash or in situ, require a controlled burn approval application and written approval from DEC. Similarly, the Alaska Department of Natural Resources (DNR) Division of Forestry (DOF) issues large scale burning permits for land clearing agricultural fires that occur on all state, municipal, borough, city, and private parcels not covered under local or federal laws. Other federal land management (FLM) agencies, private landowners, and corporations may also issue permits for prescribed burning and land clearing.

The ESMP outlines the process and identifies issues that need to be addressed by DEC, DNR, and other land management agencies or private landowners/corporations to help ensure that prescribed fire (e.g., controlled burn) activities minimize smoke and air quality problems.

DEC manages open burns to minimize health impacts from smoke and keep Alaska's air clean. Open burning regulated by DEC includes residential, agricultural, development land clearing fires, land management fires, incinerators that do not meet emission standards in 18 AAC 50.050, and fire fighter training with fuel and structures. These open burns are regulated and permitted through the open burn permit application process. Prescribed and land clearing fires require written DEC approval before starting the burn if the intent is to burn, or clear and burn, 40 acres or more during a year in the same locale.[4] Open burning is prohibited in the Fairbanks fine particulate matter nonattainment area and the Juneau Wood Smoke control areas between

[2] FR Vol 81, No. 191 / October 3, 2016
[3] Prescribed Fire on Wildland that May Influence Ozone and Particulate Matter Concentrations, August 8, 2019 (https://www.epa.gov/air-quality-analysis/exceptional-events-guidance-prescribed-fire-wildland-may-influence-ozone-and)
[4] http://dec.alaska.gov/air/air-permit/open-burn-info/

November 1 and March 31.

DNR issues Large Scale Burn Permits for any burning of wooded debris that exceeds the size and/or complexity of the Small-Scale Burn Permit (up to 10 feet in diameter and greater than four feet high) including agricultural parcels, land clearing, logging operations, and contractor certification burning. DNR burn permits are required on all state, municipal, borough, city and private parcels not covered under local or federal laws. Burn permits are required during Alaska's fire season from April 1st through August 31st and at other times of the year as designated by the DNR Commissioner.

FLM agencies issue authorizations for land burning on their managed lands and coordinate with DEC.

The **Responsible Authority** is the individual who is primarily responsible for a controlled burn for resource management objectives (prescribed or controlled burn) and ensures the conditions of the permit are met. The Responsible Authority for land management agencies and corporations submits the finalized Prescribed Burn or Land Clearing application to DEC. This person may also collect, review, and distribute any required pre- and post-burn information to DEC. The Responsible Authority should be identified in the prescribed burn or land clearing burn approval application. The Responsible Authority is often the one who conducts public meetings and has the greatest ability to interact with the public and local authorities on prescribed burning activities in their area.

To obtain valid approval for a Controlled Burn for resource management objectives or land clearing from DEC prior to each permitted ignition, the Responsible Authority must submit a controlled burn approval application to DEC containing the elements listed in Section 2.5 of this document. The application must include a section on smoke management contingencies that discuss actions to be taken in the event of smoke intrusions. The controlled burn approval for resource management (prescribed burns) or land clearing burns received from DEC will contain conditions to be met by the Responsible Authority. Applications for controlled burns may be submitted using the forms on DEC's open burn website[5] or electronically through DEC's Air Permittee Portal.

The Responsible Authority must call and notify the DEC by noon the business day prior to any planned burn (call the number listed in the Open Burn Approval Letter) or email: dec.AQ.airreports@alaska.gov.

The person calling must provide the following information:

1. Controlled Burn Approval number
2. Authorized Agency Name
3. Burn Location
4. Burn Date(s)
5. Contact Name During Burn
6. Contact Telephone Number
7. Description of how and when the Test Burn will be completed

[5] http://dec.alaska.gov/air/air-permit/open-burn-info/

8. Estimated Duration of Active Firing (ignition) Phase (prescribed burning only)
9. Estimated Duration of the Smoldering Phase (prescribed burning only)
10. Description of Pre-Burn Public Notices
11. Consideration of weather forecast and air quality advisories in area of burn

DEC staff will verify the burn approval is current and send an email message with the eleven elements to the appropriate DEC compliance and air monitoring personnel.

The final responsibility for ensuring the conditions of the burn approval permit are met rests with the Responsible Authority. On the burn day, the Responsible Authority must check whether DEC has issued burn restrictions; this information is available on the DEC Air Quality Air Advisory website.

DNR issues Large Scale Burn Permits for the burning of wooded debris that exceeds the size and/or complexity of the Small-Scale Burn Permit (up to 10 feet in diameter and greater than four feet high) including agricultural parcels, land clearing, logging operations, and contractor certification burning. DNR burn permits are required on all state, municipal, borough, city and private parcels not covered under local or federal laws. Burn permits are required during Alaska's fire season from April 1st through August 31st and at other times of the year as designated by the DNR Commissioner. Large scale burn permits less than 40 acres are not coordinated with DEC; however, the permits include smoke management principles, coordination with DNR, and a requirement for minimizing impact to the public.

FLM agencies may issue authorizations for prescribed/controlled land burning on their managed lands and coordinate with DEC if the prescribed burns are 40 acres or more in a year.

The Responsible Authority should curtail burning if, in their opinion, they are not getting adequate smoke dispersion or if local weather factors are such that smoke problems could result. The Responsible Authority communicates any potential or existing smoke problems to the DEC Meteorologist at 907-269-7676 (primary), or at 907- 269-6249 (secondary), and handles local coordination, local problem-solving, and local communication within the area affected by smoke intrusions. The Responsible Authority may request monitoring assistance from DEC, if necessary. DEC will work with the Responsible Authority.

2.3 Smoke Management Components of Burn Plans

This section is designed to give guidance on preparing smoke management information to support controlled burns used for resource management and land clearing approval applications. Consideration of smoke management is a critical component of every controlled burn approval application. This is important for meeting public health, welfare, and Class I area visibility goals as well as coordinating smoke management that may affect other burning in the area. These goals are discussed further in this section.

Evaluating potential dispersion of smoke emissions from a project is the single most important component of an effective ESMP. Land managers and owners may use a variety of evaluation methods for small projects that will not impact any sensitive features or where potential impacts are easily monitored and mitigated. For large projects, state-of-the-art tools exist to evaluate potential impacts.

DEC evaluates controlled burn applications for the potential of the project to contribute to unacceptable smoke or particulate level impacts on smoke sensitive features and populations. DEC is responsible for evaluating the cumulative impacts of multiple projects and authorizing only as many projects as the airshed can handle for public health. If during the controlled burn approval process several individual projects request ignition at close time intervals, attempts will be made to ensure the agencies and landowners involved coordinate ignition times to minimize smoke impact.

When scheduling a burn and ignition time, the Responsible Authority must consider existing air quality, meteorological, and environmental conditions to evaluate smoke dispersion. The potential effects of multiple burn days, multiple ignitions, and residual smoke must be evaluated prior to ignition.

Controlled burns (prescribed burns, agricultural and land clearing burns) will only be conducted when favorable dispersion conditions exist. The Responsible Authority should obtain wind forecasts from the National Weather Service (NWS) forecasters for wind speed and direction, an estimate of mixing heights, and expected residual smoke behavior for the night following the burn. The NWS forecast for smoke dispersion will generally integrate all pertinent weather information such as the timing of expected weather changes that may affect smoke dispersion. Prescribed burn approval conditions may require a pre-burn meteorological conference (METCON) between your fire weather team and DEC's meteorologist prior to ignition.

After ignition, if meteorological conditions change and smoke impacts sensitive features, technologically feasible and economically and environmentally reasonable actions must be taken to mitigate impacts.

2.4 Smoke Management Techniques

Below are some examples of smoke management techniques the Responsible Authority should consider to minimize emissions and smoke impacts:

- Use of ventilation factors, up-to-date weather data, and weather forecasts
- Appropriate modeling with accurate weather data and emission factors specific to the vegetation types
- Scheduling burns to use weather fronts that bring precipitation to assist with minimizing air quality impacts
- Burning when fuel moistures are low enough to prevent excessive smoldering
- Reference historic (e.g., over the last 10 years) emissions from burns in the area
- Emission projections based on sound data and science
- Identification of smoke sensitive features and receptors; burn when wind direction and

dispersion will mitigate impacts to sensitive features[6]

- Visual observations
- Monitoring
- Test burns (small piles or representative areas)

2.5 Elements of a Controlled Burn Application

Prior to each planned burn that requires DEC's approval, the Responsible Authority will submit their controlled burn approval application (Appendix B) to DEC. Each controlled burn approval will expire on December 31st of the year it was issued.

Each agency or landowner may use the DEC application format or the online Permittee Portal[7] to submit their burn approval application. The DNR, DOF also issues burn permits and has its own application form. The DOF burn permits are in addition to DEC burn approvals and address fire safety and other issues. Many of the following elements in the DEC Controlled Burn Application are also included in the DNR DOF application.

The following information is required for processing:

i. **Indicate the location, duration, and inclusive dates considered for the planned burn**.

Emission estimates are typically based on the EPA's AP-42 Handbook.
Provide a legal description or latitude and longitude of the location to be burned and the expected duration of both single events and the entire burning project. Minor changes or additional information for the burn plan can be discussed at the time DEC is notified by phone. At a minimum, the applicant is required to call DEC by noon at least one working day prior to ignition. Call the number listed in the Open Burn Approval Letter.

ii. **Identify the location of all sensitive features that might be impacted by smoke.**

The Responsible Authority should identify on a map all sensitive features, which include population centers such as communities, cities, towns, hospitals, health clinics, nursing homes, schools (in session), campgrounds, numbered Alaska highways and roads, airports, Prevention of Significant Deterioration (PSD) Class I areas, and any other areas where smoke and air pollutants can adversely affect public health, safety, and welfare.

iii. **Indicate how the public will be informed prior to, during, and after the burn.**

The best way to avoid complaints is to make sure everyone around the burn area knows

[6] Sensitive features include but are not limited to population centers such as communities, cities, towns, hospitals, health clinics, nursing homes, schools (in session), campgrounds, numbered Alaska highways and roads, airports, Prevention of Significant Deterioration Class I Areas, and any other areas where smoke and air pollutants can adversely affect public health, safety, and welfare.

[7] http://dec.alaska.gov/Applications/Air/airtoolsweb/Home/Index

when the burn will occur so they can take steps to avoid the smoke. The Responsible Authority's local contact phone number should be publicized so the public can contact you. The public must be notified at least three days prior to the anticipated burn through the local news media or the local Post Office.

iv. Indicate how coordination with other concerned agencies, including the Responsible Authorities of sensitive features, will be carried out.

Indicate how all concerned agencies will be notified prior to ignition, including authorities in control of sensitive features identified in item 2 (such as the FAA, State Troopers, military, fire department, adjacent land managers, etc.) who are potentially affected by impaired visibility or adverse smoke impacts. Include a list of telephone numbers or email addresses of agencies that must be contacted prior to ignition.

v. Indicate the source of the weather forecast and how it will be used to prevent smoke impacts.

Identify how the local and spot weather forecast will be obtained (e.g., through the NWS) prior to ignition of the controlled burn. Parameters that should be obtained are the predicted visibility, dispersion conditions, wind direction, and wind speed.

vi. Indicate how weather changes will be monitored and what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition.

Indicate how the weather will be monitored throughout the controlled burn. Identify what actions will be taken if a wind shift or other weather change begins to create an adverse smoke impact on sensitive features identified in Item 2. For example, if an inversion is expected to occur during the night, active ignitions could be ceased.

If any safety hazard is present as a result of smoke, or if requested by the authority of a sensitive feature, all technologically feasible and economically and environmentally reasonable steps to mitigate smoke impacts must be taken.

vii. Indicate what will be done to validate predicted smoke dispersion.

Indicate how smoke dispersion will be predicted. If a recommended method (test fire, small piles or areas, etc.) fails to indicate that acceptable smoke dispersion will occur, no fires will be ignited.

viii. Indicate proposed techniques to be used to enhance the active fire phase and reduce the smoldering phase.

Consider employing emission reduction techniques (Appendix D) to enhance the active fire phase and reduce smoldering and indicate what is feasible to accomplish the burn objectives.

ix. Indicate how authorities in control of sensitive features will be contacted if visibility decreases.

Provide a contingency plan (Appendix E) for smoke intrusion into populated areas, Class I areas, or other smoke sensitive features as notified in item 2. Authorities having control over sensitive features identified in item 2 must be notified if visibility is expected to decrease to less than three miles for over an hour. Indicate how authorities of sensitive features will be notified if this occurs. If any safety hazard is present, or if requested by the authority of a sensitive feature, impacts must be mitigated through steps that are technologically feasible and economically and environmentally reasonable. Contingency or emergency monitoring may be needed to measure and detect smoke intrusions on sensitive features.

x. Identify alternative disposal options for material being controlled burned.

An evaluation of alternatives to controlled burning (Appendix F) must demonstrate that controlled burning is the only technologically feasible and economically and environmentally reasonable alternative. Identify other alternative disposal options for material burned (e.g., marketing timber with a lumber company), why burning is the selected alternative and why the alternatives were not used; or list any alternatives to burning that have been done to the burn units prior to ignition.

xi. Indicate how coordination with air quality authorities having jurisdiction will take place.

At a minimum, notify DEC by telephone by noon one business day prior to ignition. Call the number listed in the Open Burn Approval Letter. Include the 11 items in Section 2.2. If a multiple day burn is planned, the responsible authority need only call before the first ignition day. A call to DEC after a multiple day burn is completed is requested. If the burn is not conducted, please notify DEC within 24 hours to schedule a new burn date.

xii. Indicate the type of vegetation to be burned, pre-burn and post-burn fuel loading estimates, and ignition technique to be used

Pre-burn fuel loading represents the amount of fuel present at the burn location (to be consumed) and should be expressed as the weight of fuel per unit area in tons per acre. The post-burn loading estimate represents the fuel remaining after the burn. The ignition technique should describe the method (e.g., hand ignition, drip torch, Heli-torch) and technique (e.g., strip head fire, backing fire, etc.).

xiii. For prescribed fires, indicate whether the fire is needed for land management purposes.

The RH Rule allows the state to adjust its uniform rate of progress towards “natural visibility” and deduct wildfire and prescribed fire emissions (wildland prescribed fires) that were conducted with the objective to establish, restore, and/or maintain sustainable and resilient wildland ecosystems; to reduce the risk of catastrophic wildfires; and/or to preserve endangered or threatened species during which appropriate basic smoke management practices were applied.[8]

xiv. Provide the approximate emissions expected for each burn and method used to estimate.

Approximate emissions can be estimated by multiplying the amount of fuel consumed (usually expressed in tons), by an emission factor expressed in pounds per ton of fuel. Emission factors can be found on EPA's website at: http://www.epa.gov/ttn/chief/ap42/ch13/. Other emission modeling tools for fires may also be used. These include but are not limited to the following tools:

- Bluesky
- SMOKE (Sparse Matrix Operator Kerner Emissions) Modeling System
- Fuel and Fire Tool (FFT)
- Fire Emission Production Simulator (FEPS)
- First Order Fire Effects Model (FOFEM)

xv. Air monitoring during burning activities

Identify how the proposed burn project may affect or potentially impact air quality at smoke sensitive features, Class I areas (Section 3 and Appendix H), and designated and air quality nonattainment areas. DEC may require monitoring for certain burns. Such burns are typically large-scale or very close to sensitive features. The monitoring requirements, if any, will be addressed within the approval process. If monitoring is required, DEC may supply monitoring equipment and personnel.

Information and maps on nonattainment and maintenance areas can be viewed at https://dec.alaska.gov/air/anpms/communities/. DEC regulation 18 AAC 50.065(f) prohibits open burning between November 1 through March 31 in or near the Fairbanks $PM_{2.5}$ nonattainment area or in the Juneau Wood Smoke Control Areas. Information on Air Quality Monitors can be DEC found at the DEC monitoring web page https://dec.alaska.gov/air/air-monitoring/.

If the burn will not adversely affect visibility in a Class I area, state that there is low potential of the burn impacting visibility in a Class I area and that monitoring will not be conducted.

Items one through eleven (i-xi) are required in an open burning application under existing DEC regulation (Appendix B); items twelve through fifteen(xii-xv) are elements that are necessary for managing smoke and developing and tracking emission inventories for regional haze.

2.6 Post-burn Reports

After each burn, the Responsible Authority will submit a post-burn report to DEC within 90

[8] 51.308 (f)(vi) (B)

days. The Responsible Authority must maintain a copy of the application and post-burn report. A post-burn report must include the following information:

- **Authorized agency**, controlled fire or range name, and approval number.
- **Date of burn(s)** – Actual dates of the burn (ignition, active burning, and smoldering phases).
- **Burn location** – Latitude and longitude of center of burn area, along with map showing burned area.
- **Total Area of burn** – The entire burn unit less any unburned inclusions (Estimate in acres).

Address the following elements:

- **Fuel type(s)** – The fuel type optimally represents the predominant fuel or cover type consumed in the fire (e.g., Sitka spruce). Specify source of fuel information (e.g,. CFDR, NFFL) and descriptive model.
- **Pre-burn fuel loading information** – Land managers who are unfamiliar with estimating pre-burn fuel loading should ask DEC to supply them with information, guidance documents, and models that are currently used to compile this information. Estimates of fuel loading are all that are necessary.
- **Fuel consumption** – The amount of fuel actually consumed expressed in tons/acre (pre-burn fuel loading data is acceptable if actual numbers cannot be determined).
- **Predominant configuration of the fuel burned,** e.g., pile, windrow, broadcast, or underburn.
- **Emission reduction techniques used** –Describe any techniques applied that reduced the actual amount of emissions, for example, changing ignition timing to allow for more efficient combustion.
- **Type of Burn** – Indicate whether the burn was performed for land management purposes.
- **Verification of weather forecasts and air quality advisory status** for the event date(s).
- **Description of public notifications made.**
- **List of complaints received** concerning excess odors or smoke (if any), including name, phone number of complainant, and any corrective action taken.

3 BURN RESTRICTIONS

3.1 Burn Restrictions – Air Quality

When DEC issues burning restrictions based on air quality concerns in any part of the state, all AWFCG members will be notified as soon as possible. If there is residual smoke in the area, it is the responsibility of the Responsible Authorities to contact DEC and check the DEC Air Advisory web site (http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories) prior to a scheduled burn to determine if a restriction is pending or in effect. Local government agencies and the DOF also need to be contacted to verify there are no open burning restrictions.

DEC Burn Restrictions can be issued as follows:

- Statewide
- By airshed(s)
- By proximity to smoke sensitive feature
- By DEC authority (18 AAC 50.245)
- Any combination of the above

Any restrictions will be based on local observations and available monitoring and meteorological data. Generally, restrictions due to poor air quality are in effect for 24 hours, although multiple day and weekend forecasts will be made. DEC encourages Responsible Authorities to restrict conducting prescribed burn projects on holiday weekends near sensitive areas or areas with high recreation use. The Responsible Authority should contact DEC if they wish to burn during holidays so that adequate contingencies are in place to manage any smoke intrusions.

The final responsibility for smoke management in the locality of the prescribed burn rests with the Responsible Authority who is conducting the burn activities. The Responsible Authorities are expected to mitigate smoke by choosing optimal times and weather conditions that meet the needs of the prescribed burn and also minimizes smoke intrusions if, in their opinion, they are not getting adequate smoke dispersion, or if local weather factors or topographical features are such that smoke problems could result. Conversely, if local weather conditions appear to be more favorable for burning than what was forecast, Responsible Authorities should contact DEC to discuss options.

Prescribed burn ignitions should not occur if:

- A DEC Air Quality Advisory is in place for areas that could be impacted by the burn;
- Air quality is deteriorating and is expected to continue to deteriorate;
- There is a high probability that a significant amount of smoke will intrude into "sensitive features";
- The burn will not comply with the Alaska SIP or the federal CAA regarding visibility protection of Class I federal areas (Appendix E);

- Any state or federal air quality standards, regulations, laws, or rules would be violated;
- Air quality is deteriorating and is expected to continue to deteriorate which may result in an Air Quality Episode (Appendix G) being declared in the next 24-hour period. Additional ignitions will be denied until conditions improve in the area.

3.2 **Burn Restrictions - Fire Prevention**

DNR DOF issues temporary suspensions or closures on permitted burning activities covered under small and large scale burn permits due to red flag warnings, high fire danger, weather events, or high wildland fire activity. This includes, but is not limited to, burn barrels and burning activities involving maintained lawns, brush piles, agricultural parcels, land clearing, and logging operations. Boroughs, municipalities, and areas that issue their own local permits may have different or additional burning restrictions that apply, and it is the landowners' responsibility to check with local agencies to determine what those may be.

The US Forest Service (USFS), Bureau of Land Management (BLM) and local fire departments will also issue closures on burning activities. While the primary purpose is fire prevention, they also serve to mitigate potential air quality issues related to fire.

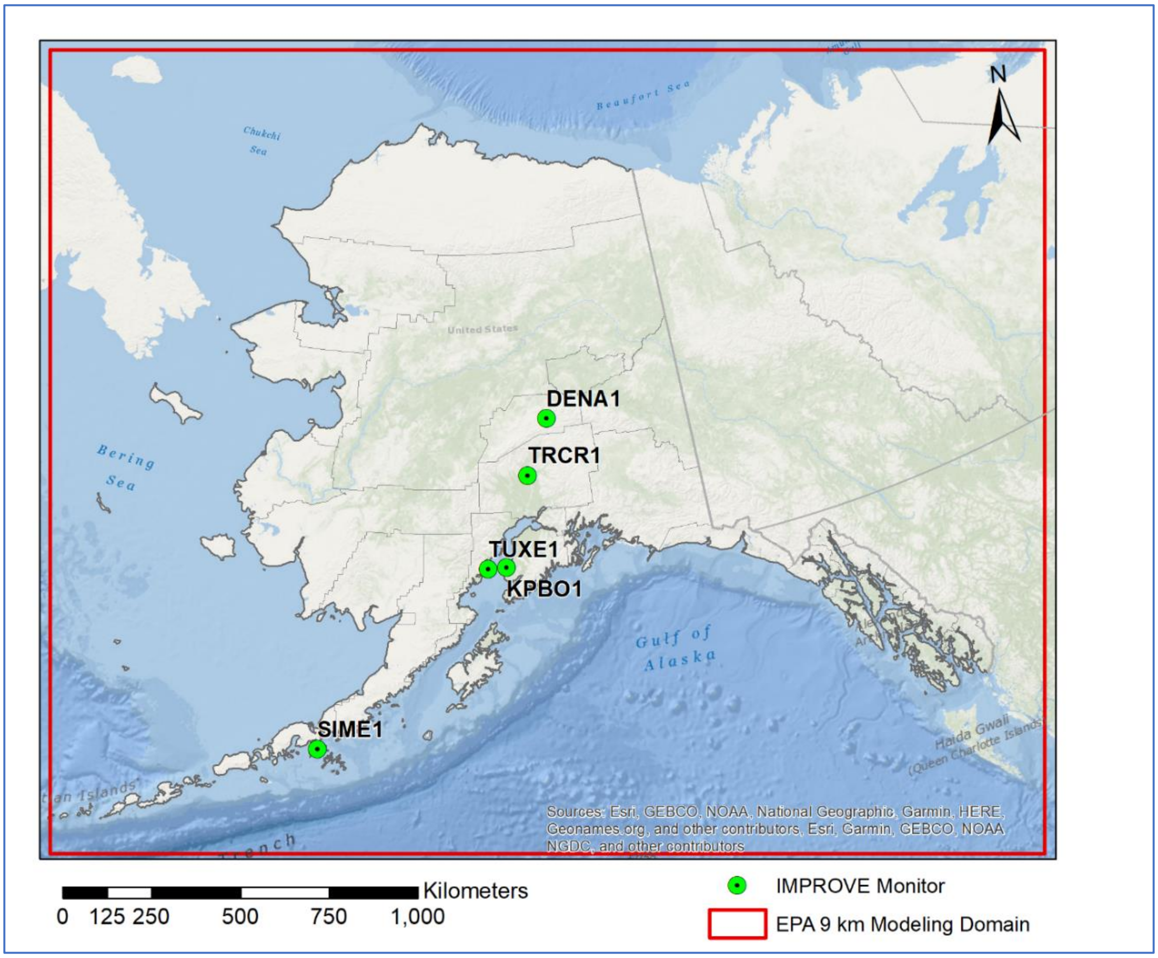
4 AIR QUALITY MONITORING

4.1 **Visibility and Regional Haze Monitors**

All states must develop programs to make "reasonable progress" toward meeting the visibility goals in designated Class I areas as part of their air quality SIPs. Alaska has four Class I areas: Denali National Park & Preserve, Tuxedni Wilderness Area, Simeonof Wilderness Area, and Bering Sea Wilderness Area (Figure 1 Class I Area Air Quality Monitors). The EPA has four monitors to track air quality for regional haze purposes. Denali Class I area has two monitors. One at the Denali Headquarters (DENA1) across the Park Road from park headquarters, approximately 250 yards from headquarters area buildings and the Trapper Creek location (TRCR1) which is located 100 yards east of the Trapper Creek Elementary School and a quarter mile south of Petersville Road.

The Tuxedni Wilderness monitor (TUXE1) was originally near on the west side of Cook Inlet, approximately 5 miles from the Tuxedni Wilderness Area. The site was operational as of December 18, 2001, but in 2014 the monitor moved to a new site roughly 3 miles south of the community of Ninilchik on the Kenai Peninsula (KPB1). The Simeonof Class 1area monitor (SIME1) is in the community of Sand Point which is approximately 60 miles north west of the Simeonof Wilderness Area.

Figure 1 Class I Area Air Quality Monitors



4.2 Ambient Air Monitoring

"Ambient air monitoring" within the context of the ESMP refers to air quality monitoring conducted as a consequence of wildfire activity or in support of prescribed or agricultural fire activities. All monitoring of prescribed burns over 40 acres in size should be performed with DEC approved air monitoring samplers using standard operating procedures for monitor operation, data collection, and QA/QC. Samplers should be placed outside of the fire zone in a location that is representative of a smoke sensitive area, such as a hospital or health clinic.

Monitor site placement depends on the meteorology (primarily wind direction), area topography, and the relationship of the smoke and airshed to the populated area. Monitoring may require the deployment of several samplers. Example: a land management agency is planning a large prescribed burn, and the closest community is fifteen miles away. Weather forecasts indicate that the winds could blow toward the town; therefore, a monitor should be placed in or near the community.

Public health protection is the focus of all monitoring site placement. Responsible Authorities may request assistance from the DEC Monitoring and Quality Assurance Program to identify appropriate monitoring sites. Time and materials fee or a reimbursement agreement with DEC may be necessary.

DNR also monitors large scale permitted open burns. In most cases, the operator is required to check with DNR for weather conditions and on large projects, DNR communicates with DEC for weather conditions.

4.3 Smoke Monitoring Policy

DEC is willing to work with land managers or landowners to assess smoke impacts and protect public health through ambient air monitoring assistance. While DEC does not have funding to support prescribed fire activity, the air monitoring section does have trained staff who could be mobilized to support a fire event by evaluating smoke impacts or monitoring air quality for prescribed burns. Funding agreements will be necessary for DEC to support monitoring.

With newer and more portable real-time monitors, the ability to monitor smoke impacts has become easier and more accurate.

5 AIR QUALITY COMPLAINT PROCEDURES

5.1 General Procedures

There may be occasional intrusions of smoke into areas with communities or protected airsheds. The Responsible Authority and DEC are responsible for complaint processing and smoke-intrusion reporting for air quality concerns. Other agencies are responsible for complaint procedures for fire prevention and response. Documentation of such occurrences will improve future prevention measures and properly inform responsible officials and the public.

The nature of the complaint will determine what procedure is to be followed to address the complainant and which agency is responsible for investigation. Every attempt should be made to resolve the complaint at the lowest possible level. Any agency or landowner receiving complaints should handle the initial situation if they are knowledgeable of the ESMP or the specific burn and should learn as much information about the burn as possible in order for proper follow-up actions.

Complaints can come in several forms. Historically, complaints have been received from the public at large where the basis for the complaint is an objection to seeing smoke, smelling smoke, and health concerns because of smoke. Local explanation of the program and resolution of the complainant's concerns will often solve the problem. If an AWFCG member receives a complaint for open burning or a prescribed burn, they should explain the purpose and basis for the ESMP in order to inform the caller that a control program is in place in Alaska. If a complaint is received for garbage burning or an unauthorized burning activity, the ESMP is not the guiding document.

The following information needs to be collected in order for the organization or landowner to take proper and necessary follow up actions. Information to be collected includes:

- Name and contact information of the complainant
- Description of the complaint
- Location of the burn (include best estimate of burn location and direction of smoke)
- Time of day
- Any other comments that will aid in the follow up process (e.g., people see or smell smoke, etc.)

The Responsible Authority should forward any complaints received to DEC with their post-burn report or when requested by DEC. If another AWFCG member receives a smoke complaint, it will be forwarded to the appropriate agency representative (usually the Responsible Authority or DEC) as soon as possible. If a smoke complaint on a land clearing burn is received by an AWFCG member, the complaint will be forwarded to DEC as soon as possible. DEC will immediately forward complaints it receives to the Responsible Authority for resolution if the complaint information suggests a prescribed burn is conducted during a restricted period or if smoke dispersion is less than adequate for the burn.

DEC will log all complaints received into the DEC Complaint Automated Tracking System (CATS) via AirTools, the DEC Air Quality database. For each complaint received by the Responsible Authority and DEC, pertinent data will be recorded along with the final resolution or actions taken to address the complaint. This information may be valuable for contacting community residents prior to future planned burns.

5.2 Public Notification and Exposure Reduction

The cooperating agencies and landowners will agree on trigger levels, communication strategies, and contingency measures before the burn project is ignited.

If smoke impacts develop from a prescribed burn and it becomes necessary to issue air quality notices (e.g., advisories, alerts, warnings, or emergencies), DEC and the Responsible Authority will cooperatively determine a course of action. The Responsible Authority should consult with DEC regarding appropriate short-term fire management response to abate verified impacts to smoke sensitive areas. Management responses should be implemented that will mitigate adverse impacts to public health using technologically feasible and environmentally and economically reasonable actions.

According to 18 AAC 50.245, DEC may, at its discretion, declare an air episode or advisory (Appendix G) and prescribe and publicize curtailment actions when the concentration of $PM_{2.5}$ in the ambient air has reached the levels described in the table below. Advisories are based on current and expected smoke impacts, meteorological conditions, and qualitative assessment by trained staff. Advisories may be issued without monitoring data. Episodes are called at specific levels of air pollution and have associated regulatory requirements. Currently, the $PM_{2.5}$-episode requirements limit the opacity of emissions from woodstoves.

DEC uses the levels in the chart below to announce air quality advisories and episodes. The National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$ are $35 \mu g/m^3$ for the 24-hour average and $12 \mu g/m^3$ for the annual average. DEC will follow the AQI levels and will call air quality advisories when levels reach the AQI category of ‘Unhealthy for Sensitive Groups,’ i.e., when levels exceed or are expected to exceed the NAAQS for $PM_{2.5}$.

Episode Levels for $PM_{2.5}$					
AQI Level	**AQI Value**	**Hr PM2.5 (µg/m3)**	**Episode Levels**	**Cautionary Statements**	**Descriptive Statements**
Good	0-50	0-12.0		None	None
Moderate	51-100	12.1-35.4		None	None
Unhealthy for sensitive groups	101-150	35.5-55.4		People with respiratory or heart disease, the elderly and children should limit prolonged exertion	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	55.5-150.4		People with respiratory or heart disease, the elderly and children should limit prolonged exertion; everyone else should limit prolonged exertion.	Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
Very Unhealthy	201-300	150.5-250.4	Alert	People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion	Health Alert: Everyone may experience more serious health effects.
Hazardous 1	301-400	250.5-350.4	Warning	Everyone should avoid any outdoor exertion.	Health warnings of emergency conditions
Hazardous 2	401-500	350.5-500	Emergency	People with respiratory or heart disease, the elderly and children should remain indoors.	The entire population is more likely to be affected.

When DEC declares an advisory they will publicize actions individuals can take to protect public health and may request voluntary emission restrictions from any permitted activity that might impact the area subject to the advisory (18 AAC 50.245). Air quality advisories (Appendix G) include broad educational statements that advise people about the potential for smoke impacts in the area, recommend actions for persons with respiratory illnesses or heart disease, and suggest ways to limit exposure. Advisories may also include restrictions on open burning (18 AAC 50.065(e)). Advisories are posted on DEC's advisory website.[9]

$PM_{2.5}$ alert, warning, and emergency episode levels each have 24-hour average particulate concentration levels and have action statements that suggest ways that the general public and sensitive individuals can limit their exposure. These notices are based on real-time ambient monitoring, in combination with weather forecasts. Alerts will not be issued based solely on visual estimations of smoke impacts nor on suspected smoke impacts.

If smoke intrusions cause unacceptable area-wide impacts, including nuisance smoke, DEC will deny the ignition of new controlled burns that could impact the area and announce air quality advisories. Air quality advisories are typically appropriate for situations where the potential for multiple-day smoke impacts exists.

[9] http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories

6 PUBLIC EDUCATION

Public education and outreach prior to burn ignition greatly decreases public complaints and often significantly decreases potential public health impacts attributed to smoke intrusion. Every effort should be made by the Responsible Authority to involve the potentially affected community in an early and on-going discourse on the use of prescribed fires in their area.

Public outreach often helps avoid conflicts which might not otherwise be identified, such as igniting burns during scheduled athletic events or during annual hunting/fishing opening dates, holidays, or other special events.

Agencies will work together with partners and other affected groups and individuals to prevent unauthorized ignition of wildfires. Public education guidance should be cooperatively developed and/or distributed by the AWFCG for use by Responsible Authorities. Such guidance would discuss options available for adequate public education, including public meetings, public service announcements, news articles, and public comment periods. The FireWise campaign[10] and the FireWise Alaska handbook[11] have been successful public education platforms and could easily be used as a pattern or as a vehicle to promote public education on prescribed burning objectives at a local or airshed level where appropriate.

Other Public Education Suggestions:

- Seek out appropriate forums to review written information about rules and regulations, and answers to your questions.
- Initiate contacts with local news media or community websites to generate feature stories about the prescribed fire program and burn regulations.
- Include appropriate information about prescribed and land clearing burns in displays used at public gatherings, such as fairs.
- Provide press releases and public service announcements when needed.
- Coordinate with other agencies' public affairs offices to combine information about burning when appropriate.
- Develop brochures and other printed materials for distribution to appropriate sources and recipients or use regulatory agency brochures if applicable.

There are many useful federal, state and local websites applicable to land clearing and prescribed burning activities.

10 http://www.firewise.org/
11 http://forestry.alaska.gov/Assets/pdfs/home/firewise09.pdf

7 FEES AND PROGRAM FUNDING

Fees for a Controlled Burn for Resource Management and Controlled Burn for Land Clearing approvals are posted in Alaska Administrative Code 18 AAC 50.400(l). Open burning regulations are located at 18 AAC 50.065. For prescribed burning less than 40 acres, review the DNR DOF Large Scale Burn Permits.

8 ENFORCEMENT

Regulations currently exist that prohibit burning in a manner that adversely impacts public health or the environment (18 AAC 50.065, 50.110, and 50.245). Adherence to State of Alaska regulations is mandatory. It is the responsibility of DEC to enforce the regulations. Additional regulations may be promulgated if the State determines that present regulations are inadequate for protecting public health.

DNR DOF regulations are focused on fire prevention, and their enforcement authority lies in statute (AS. 41.15.950)[12]. Other agencies also have fire restrictions or issue permits. These restrictions are compiled online at https://dec.alaska.gov/air/anpms/alaska-fire-restrictions/ and in the AWFCG Master Agreement Operating Plan Section IV.6. Public Use Restrictions. During the fire season, DNR, DEC, and regional/municipal fire authorities coordinate investigations and enforcement as applicable and as much as possible.

Agencies will work together with partners and other affected groups and individuals to pursue investigation of human caused wildfires to understand cause and remedies. Unacceptable smoke impacts that occur because the Responsible Authority was negligent or failed to follow the open burning regulations may result in enforcement action. Should an agency or landowner fail to follow procedures, requirements, or restrictions issued under the open burning regulation, it may be considered grounds for revocation of the burn permit.

A mechanism similar to the program used to enforce air quality regulations for industrial sources is used to enforce wildland burning regulations or agreements. Such a program provides:

- A process for notifying land managers of the unacceptable impacts.
- An opportunity for the land managers to respond to allegations of unacceptable impacts.
- The ability for DEC to take regulatory action, including cooperative agreements, which may require ESMP revisions.
- An appeal process.

In addition, the ESMP program will be reevaluated if a Responsible Authority follows ESMP guidelines but resultant smoke still violates the NAAQS or produces significant complaints.

9 PROGRAM EVALUATION

12 http://forestry.alaska.gov/Assets/pdfs/burn/2019/statutes%20&%20regs%20combined%20for%20burn%20webpages.pdf

A periodic review by interested stakeholders of the ESMP effectiveness should take place on a yearly basis or as necessary. Preferably, this would take place in the fall after all prescribed burning activities are complete. The program evaluation should include a review of the ESMP effectiveness and should include consideration of the role of prescribed fire in meeting the goals in a multi-year or resource management plan. The objections should include whether the program establishes, restores, and/or maintains a sustainable and resilient wildland ecosystem and/or preserves endangered or threatened species.

Effectiveness reviews should also consider air quality impacts as well as a review of any received post-burn reports, which may describe implemented contingency plans due to smoke impacts or use of ESMP recommendations. participants in the review process (e.g., original program developers to include landowners/managers, air quality managers, the public, etc.) or at a minimum, agency participants in the AWFCG.

The program evaluation should review the program objectives over the review period (e.g., acres burned, anticipated/desired future acres burned, needed modifications).

10 LIST OF ACRONYMS, ABBREVIATIONS, and DEFINITIONS

10.1 Acronyms

($\mu g/m^3$)	micrograms per cubic meter
AAC	Alaska Administrative Code
AQ	Air quality
AICC	Alaska Interagency Coordination Center
AWFCG	Alaska Wildland Fire Coordinating Group
CAA	Clean Air Act
CFR	Code of Federal Regulations
DEC	Alaska Department of Environmental Conservation
ESMP	Enhanced Smoke Management Plan
NAAQS	National Ambient Air Quality Standards
($\mu g/m^3$)	micrograms per cubic meter
PM	Particulate matter
SIP	State Implementation Plan
WESTAR	Western States Air Resources Council
WRAP	Western Regional Air Partnership

10.2 Definitions

Agricultural Burn – also known as *Controlled Burning for Land Clearing* – open burning of woody debris material by farmers and developers. Approval is required from DEC if the intent is to clear and burn 40 acres or more per year.

Airshed is a geographical area where atmospheric characteristics are similar (e.g. mixing height and transport winds).

Air Quality Advisory refers to a period where an air episode may warrant public notification. Air quality advisories are general, educational-type statements which advise the general public about the potential for smoke impacts and suggest ways to limit exposure. “Advisory” status does not involve any required action on the part of the public or the burn agency and often does not have monitoring data associated with it, though it may refer to weather forecasts.

Air Quality Alert, Warning, or Emergency status refers to a period where an air episode is declared, as stated in 18 AAC 50.245. Valid air quality monitoring data and weather forecasts should be used to document air quality status and duration. Regardless of the source of the emissions, air episodes involve required actions on the part of the public (such as avoiding outdoor exercise) or land managers (such as avoiding additional emissions for the area).

Alternatives (or “burning alternatives”) refer to mechanical, biological, or chemical treatment methods of fuel reduction that do not include burning, such as chipping, grinding, logging, mechanical/hand thinning with removal, etc.

Ambient air is that portion of the atmosphere, external to buildings, to which the general public has access.

Ambient air monitoring in this document refers to air quality monitoring done in support of prescribed fire activities or in response to wildland fire activities.

Anthropogenic emissions are produced by human activities.

Approval or controlled burn approval (or “permit”) refers to the DEC written approval that is required if material from land clearing operations for prescribed fire for agricultural, development, hazard fuel reduction, and forest or habitat management if the area burned, or the material collected to be burned, is 40 acres or greater per year. (18 AAC 50.065(g))

Emission Factor - AP-42 Handbook is the EPA’s Compilation of Air Pollutant Emission Factors for stationary point, area, and mobile sources. An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Emission factors are then used to estimate the magnitude of a source’s pollutant emissions.

Burn plan is a strategic plan for managing a specific fire project to meet specific resource management objects. The plan includes the project objective, fire prescription (including smoke management components), personnel, organization, equipment, etc. It is used to apply for a DEC Controlled Burn Approval.

Burn restriction (see "Restriction").

Class I area refers to an area set aside under the Clean Air Act (CAA) Section 162 to receive the most stringent protection from air quality degradation. This classification protects air quality in international parks, national parks greater than 6,000 acres in size, and national wildernesses greater than 5,000 acres in size, that were in existence on August 7, 1977, and any additions to those areas.

Clean Air Act (CAA) means 42 U.S.C. 7401 – 7671q, as amended through November 15, 1990. (18 AAC 50.990(17)).

Controlled Burn Approval application is the permit application required by DEC as part of the controlled burn approval process.

Controlled Burning for Land Clearing – see "Agricultural Burn"

Emission factors – are units are stated as "pounds of emission produced per ton of fuel consumed." An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Emission factors are not yet available for accurately predicting emissions from burns in fuels such as Sitka spruce forests, tundra or deep duff layers commonly found in Alaska. Efforts are being made by the USDA Forest Service, Pacific Northwest Experiment Station to conduct research that will lead to more accurate estimations of emissions factors for Alaska. Emission factors are typically based on the EPA's AP-42 Handbook.

Enhanced Smoke Management Plan (ESMP) is the agreement and program plan developed and agreed upon by the AWFCG. The purposes of ESMPs are to mitigate the nuisance and public health/safety hazards (e.g., on roadways and at airports and at smoke sensitive features) posed by smoke intrusions into populated areas; to prevent deterioration of air quality and NAAQS violations; and to address visibility impacts in mandatory Class I areas in accordance with the regional haze rules.

Fuel includes combustible vegetative matter such as grass, tundra, trees, shrubs, limbs, duff, and stumps.

Fuel loading is the amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available fuel (consumable fuel) or total fuel and is usually dry weight.

Fuel type is an identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specified weather conditions.

Inversion refers to a layer of air in which the temperature increases with height. The effect of various types of inversions is to greatly retard the dispersal of smoke.

Land manager/owner is the responsible Line Officer for the Federal agencies or designated individual in Federal, State, and private organizations who is authorized to make decisions concerning the management of specified land areas.

Member representative (or **Representative member** or **AQ Member**) means the individual who represents his or her organizational entity (agency or company) and is responsible for collecting and submitting pertinent agency burn information to the DEC Coordinator and AWFCG from their representative agency or company. They attend the annual meetings of the AWFCG.

Mixing height is measured from the surface upward, and it is the height to which relatively vigorous mixing occurs in the atmosphere due to turbulence and diffusion.

National Ambient Air Quality Standards (NAAQS) are the standards established by the EPA for maximum acceptable concentrations of pollutants in the ambient air to protect public health with an adequate margin of safety and to protect public welfare from any known or anticipated adverse effects of such pollutants (e.g. visibility impairment, materials damage, etc.) in the ambient air.

Natural background condition is an estimate of the visibility conditions at each Federal Class I area that would exist in the absence of human-caused impairment.

Non-attainment areas are areas that exceed the National Ambient Air Quality Standards (NAAQS) for certain "criteria pollutants" established by EPA or the states. Criteria pollutants have specific standards and exist for ozone, carbon monoxide, oxides of sulfur, oxides of nitrogen, lead, and particulate matter.

Nuisance smoke is the amount of smoke in the ambient air at concentrations below the NAAQS which interfere with a right or privilege common to members of the public, including the use or enjoyment of public or private resources. Nuisance smoke is regulated by Alaska regulation 18 AAC 50.110, "Air Pollution Prohibited: A person may not cause or permit any emission that is injurious to human health or welfare, animal or plant life, or property, or that would unreasonably interfere with the enjoyment of life or property."

Open burning means the burning of a material that results in the products of combustion being emitted directly into the ambient air without passing through a contaminant outlet.
(18 AAC 50.990(65)) Open burning includes prescribed fire (Controlled Burning for Resource Management) and Controlled Burning for Land Clearing (agricultural burning). The terms are used interchangeably in this document.

Particulate matter (PM) refers to any airborne material, except uncombined water, which exists as a solid or liquid at standard conditions (e.g., dust, smoke, mist, fumes, or smog).

PM_{10} refers to particles with an aerodynamic diameter less than or equal to 10 micrometers. Emissions of PM_{10} are significant from fugitive dust, power plants, commercial boilers, metallurgical industries, mineral industries, forest and residential fires, and motor vehicles.

$PM_{2.5}$ refers to particles with an aerodynamic diameter less than or equal to 2.5 micrometers. A measure of fine particles of particulate matter that comes from fuel combustion, agricultural burning, woodstoves, etc.

Prescribed fire means “any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific land or resource management objectives. (40 CFR 50.1(m))

Prescription is a written statement defining the objectives to be attained and may include, but is not limited to, temperature, humidity, wind direction, wind speed, fuel moisture, soil moisture, and fire behavior characteristics under which a fire will be allowed to burn. A prescription is generally expressed as acceptable ranges of the prescription elements. The extent of the geographic area to be burned may also be a prescriptive element.

Regional haze is defined in 40 CFR 51.301 and generally refers to concentrations of fine particles in the atmosphere extending up to hundreds of miles across a region and promoting noticeably hazy conditions, wide-spread visibility impairment, especially in mandatory Class I areas where visibility is an important value.

Responsible Authority (Burn Boss, Fire Management Officer, land manager, etc.) is the individual who collects, reviews, and disseminates pre- and post- burn information to the DEC staff in the form of the Burn Application and Post-burn Report. This person is tasked with the responsibility of ensuring compliance with the approved burn permit, daily operations, coordinating burn information, providing smoke forecasting and air quality restrictions for their burns. This person(s) may also facilitate local area meetings to evaluate program effectiveness and solve local issues related to their agency’s burn plans. The Responsible Authority often has line authority and is the primary person with whom DEC will interact prior to, during, and after a burn. The Responsible Authority should be identified in the Burn Application that is submitted to DEC.

Restriction to burning occurs when an air quality episode is declared which covers the area of concern. Restrictions to burning are generally issued for a twenty four-hour period but may be for a longer period. The alert may be based on an assessment that inadequate air ventilation is available which would inhibit the dispersal of pollutants, such as inversions and low wind speeds.

Regardless of the source of the emissions, public notifications will be issued when smoke is impacting the area. Persons with controlled burn approvals must curtail their fire if their portion of the airshed is becoming overloaded or local weather factors would create smoke problems, even though no other restrictions have been imposed, i.e. wind moving directly into sensitive areas, inversions, etc.

Smoke dispersion refers to the processes within the atmosphere which mix and transport smoke away from the source. This depends on three atmospheric characteristics: atmospheric stability, mixing height, and transport winds.

Smoke intrusion refers to smoke from a prescribed fire entering a designated area at unacceptable levels.

Smoke sensitive features are population centers, such as towns and villages, camp grounds and trails, hospitals, health clinics, nursing homes, schools (in session), numbered Alaska highways and roads, airports, Federal Class I areas, etc., where smoke and air pollutants can adversely affect public health, safety, and welfare.

Smolder means to burn and smoke without flame. (18 AAC 50.990(99))

State Implementation Plan (SIP) is a CAA Section 110 required document in which states adopt emission reduction measures necessary to attain and maintain NAAQS and meet other requirements of the CAA (such as regional haze).

Transport winds is a term that refers to the wind speed and direction at the final height of smoke plume rise.

Violation of the PM NAAQS refers to 40 CFR Part 50, last revised in 2006. The daily PM_{10} standard is violated when the 24-hour concentrations exceeds 150 µg/m3 at any monitor within an area more than one time per year. The annual PM_{10} standard has been revoked.

The NAAQS levels for $PM_{2.5}$ are set at a daily concentration less than or equal to 35 µg/m3 and an annual mean concentration of less than or equal to 15 µg/m3. The daily standard is violated when the 98th percentile of the distribution of the 24-hour concentrations for a period of one year (averaged over three calendar years) exceeds 35 µg/m3 at any monitor within an area. The annual standard is violated when the annual arithmetic mean of the 24-hour concentrations from a network of one or more population-oriented monitors (averaged over three calendar years) exceeds 12 µg/m3. Compliance with the annual $PM_{2.5}$ NAAQS is based on population-oriented monitors because the health information, upon which the standard is based, relates area-wide health statistics to area-wide air quality as measured by one or more monitors.

Visibility Protection refers to Section 169A of the CAA which establishes a national visibility goal to ". . . prevent any future, and remedy any existing, impairment of visibility in mandatory Class I areas." Alaska has four federal Class I areas that are national parks or wilderness areas (Appendix G).

Western Regional Air Partnership (WRAP) is a voluntary organization comprised of western governors, tribal leaders and federal agencies, and is charged "to identify regional or common air management issues, develop and implement strategies to address these issues, and formulate and advance western regional policy positions on air quality.

Western States Air Resources Council (WESTAR) is an organization which consists of fifteen states including Alaska. WESTAR was formed to promote the exchange of information between the States, serve as a forum for western regional air quality issues of common concern and share resources for the common benefit of the member states.

Wildfire means any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event.

Wildland means an area in which human activity and development is essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered. The 2016 Exceptional Events Rule, and the 2017 Regional Haze regulation update clarifies that 'wildland' includes lands that are predominantly wildland, such as land in the wildland urban interface.

10.3 REFERENCES

1. EPA's Interim Air Quality Policy on Wildland and Prescribed Fire, April 23, 1998 (EPA's Interim Policy).

2. NWCG Smoke Management Guide for Prescribed Fire, PMS 420-3, November 2020.

3. AWFCG Master Agreement Operating Plan Section IV.6. Public Use Restrictions.

4. NWCG Interagency Prescribed Fire Planning and Implementation Procedures Guide, PMS 484July 2017

5. Regional Haze Rules, 40 CFR Part 51, 2017

6. 2016 Alaska Interagency Wildland Fire Management Plan (March 2020 Review)

7. National Wildfire Coordinating Group. 1996. Glossary of Wildland fire terminology. PMS 205. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center. 162 p.

8. USDI and USDA Forest Service. 1998. Wildland and prescribed fire management policy- implementation procedures reference guide. National Interagency Fire Center, Boise, ID. 81pp.

9. EPA Prescribed Fire on Wildland: Addendum to the Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations, August 8, 2019

11 SIGNATURE PAGE

Alaska Enhanced Smoke Management Plan Approval

The Alaska Wildland Fire Coordinating Group approved this version of the Alaska Enhanced Smoke Management Plan on December 1, 2021.

Agency Representative	Signature
Bureau of Indian Affairs, US Department of the Interior Tom St. Clair	THOMAS ST CLAIR Digitally signed by THOMAS ST CLAIR Date: 2021.12.01 11:15:31 -09'00'
Bureau of Indian Affairs. US Department of the Interior Tom St. Clair	
Bureau of Land Management, Alaska Fire Service Kent Slaughter	KENT SLAUGHTER Digitally signed by KENT SLAUGHTER Date: 2021.12.01 11:26:44 -09'00'
Alaska Dept. of Natural Resources, Division of Forestry Tim Dabney	Timothy A. Dabney Digitally signed by Timothy A. Dabney Date: 2021.12.01 14:15:36 -09'00'
US Department of the Interior. US Fish & Wildlife Service Robert Narus	ROBERT NARUS Digitally signed by ROBERT NARUS Date: 2021.12.03 12:22:57 -09'00'
Tanana Chiefs Conference Clinton Northway	Clinton Northway Digitally signed by Clinton Northway DN: cn=Clinton Northway, o=Tanana Chiefs Conference, ou=Fire, email=clinton.northway@tananachiefs.org, c=US Date: 2021.12.09 11:29:47 -09'00'
US Department of the Interior, National Park Service Alaska Regional Office Chuck Russell	CHARLES RUSSELL Digitally signed by CHARLES RUSSELL Date: 2021.12.08 09:00:40 -09'00'
US Forest Service, Region 10 Bobette Rowe	BOBETTE ROWE Digitally signed by BOBETTE ROWE Date: 2021.12.08 06:28:44 -09'00'
Alaska Dept. of Fish & Game. Division of Wildlife Conservation Sue Rodman	Sueanne Rodman
Chugachmiut Charlie Sink	Charlie Sink 1/5/2022
Alaska Dept. of Environmental Conservation, Air Quality Molly Birnbaum	Alice Edwards 1/6/2022 Alice Edwards, Air Quality Division Director
Assoc. of Village Council Presidents Vivian Korthuis, CEO	Vivian Korthuis Vivian Korthuis (Dec 10, 2021 16:01 AKST)

APPENDICES

List of Appendices

Appendix A

Alaska Wildfire Coordinating Group (AWFCG) =Membership List

Alaska Wildland Fire Coordinating Group Membership
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Appendix B

DEC Open Burning Policy and Guidelines

POLICY AND GUIDELINES

The State of Alaska has two basic concerns with open burning: 1) that it does not spread and become a wildfire, and 2) that it does not cause air pollution that creates a health hazard or a public nuisance. The Department of Natural Resources (DNR) is responsible for regulations and permits to address the first concern (fire safety). The Department of Environmental Conservation (DEC) is responsible for regulations and permits to address the second concern (environmental protection).

It is the policy of the DEC to eliminate, minimize, or control open burning and to encourage other methods of disposal where possible. When open burning is permitted by the DEC, the permittee must provide for the most efficient combustion possible for the material to be burned. The DEC supports the maximum recycling and utilization of wood and forest products to reduce the volume of material requiring burning.

All open burning in the state, whether requiring written approval from DEC or not, must be done in a way that maintains maximum combustion efficiency throughout the burning period.

The Enhanced Smoke Management Plan (ESMP) establishes the procedures for resource management and land clearing burns in the state and is a part of the state's Regional Haze State Implementation Plan.

18 AAC 50.110. AIR POLLUTION PROHIBITED.

18 AAC 50.110. Air pollution prohibited. No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property. (Eff. 5/26/72, Register 42)

Authority: AS 46.03.020 AS 46.03.710

18 AAC 50.065. OPEN BURNING

18 AAC 50.065. Open burning. (a) **General Requirements.** Except when conducting open burning under (g), (h), or (i) of this section, a person conducting open burning shall comply with the limitations of (b) - (f) of this section and shall ensure that

(1) the material is kept as dry as possible through the use of a cover or dry storage;

(2) before igniting the burn, noncombustibles are separated to the greatest extent practicable;

(3) natural or artificially induced draft is present;

(4) to the greatest extent practicable, combustibles are separated from grass or peat layer; and

(5) combustibles are not allowed to smolder.

(b) **Black Smoke Prohibited**. Except for firefighter training conducted under (h) or (i) of this section, open burning of asphalts, rubber products, plastics, tars, oils, oily wastes, contaminated oil cleanup materials, or other materials in a way that gives off black smoke is prohibited without written department approval. Department approval of open burning as an oil spill response countermeasure is subject to the department's *In Situ Burning Guidelines for Alaska*, adopted by reference in 18 AAC 50.035. Open burning approved under this subsection is subject to the following limitations:

(1) open burning of liquid hydrocarbons produced during oil or gas well flow tests may occur only when there are no practical means available to recycle, reuse, or dispose of the fluids in a more environmentally acceptable manner;

(2) the person who conducts open burning shall establish reasonable procedures to minimize adverse environmental effects and limit the amount of smoke generated; and

(3) the department will, in its discretion, as a condition of approval issued under this subsection, require public notice as described in (j) of this section.

(c) **Toxic and Acid Gases and Particulate Matter Prohibited.** Open burning or incineration of pesticides, halogenated organic compounds, cyanic compounds, or polyurethane products in a way that gives off toxic or acidic gases or particulate matter is prohibited.

(d) **Adverse Effects Prohibited**. Open burning of putrescible garbage, animal carcasses, or petroleum-based materials, including materials contaminated with petroleum or petroleum derivatives, is prohibited if it causes odor or black smoke that has an adverse effect on nearby persons or property.

(e) **Air Quality Advisory**. Open burning is prohibited in an area if the department declares an air quality advisory under 18 AAC 50.245 or 18 AAC 50.246, stating that burning is not permitted in that area for that day. This advisory will be based on a determination that there is or is likely to be inadequate air ventilation to maintain the standards set by 18 AAC 50.010. The department will make reasonable efforts to ensure that the advisory is broadcast on local radio or television.

(f) **Wood Smoke Control and PM-2.5 Nonattainment Areas**. Open burning is prohibited between November 1 and March 31 in each wood smoke control area identified in 18 AAC 50.025(b) and in each PM-2.5 nonattainment area identified in 18 AAC 50.015(b)(3). In a PM-2.5 nonattainment area, a local air quality open burn permit program may replace the seasonal open burning prohibition in this section if the program

(1) does not cause or contribute to violations of the PM-2.5 ambient air quality standards set out in 18 AAC 50.010; and

(2) is part of a local air quality plan included in the *State Air Quality Control Plan*, adopted by reference in 18 AAC 50.030.

(g) **Controlled Burning**. Controlled burning to manage forest land, vegetative cover, fisheries, or wildlife habitat, other than burning to combat a natural wildfire, requires written department approval if the area to be burned exceeds 40 acres yearly. The department will, in its discretion, require public notice as described in (j) of this section.

(h) **Firefighter Training: Structures**. A fire service may open burn structures for firefighter training without ensuring maximum combustion efficiency under the following circumstances:

(1) before igniting the structure, the fire service shall

(A) obtain department approval for the location of the proposed firefighter training; approval will be based on whether the proposed open burning is likely to adversely affect public health in the neighborhood of the structure;

(B) visually identify materials in the structure that might contain asbestos, test those materials for asbestos, and remove all materials that contain asbestos;

(C) ensure that the structure does not contain

(i) putrescible garbage;

(ii) electrical batteries;

(iii) stored chemicals such as fertilizers, pesticides, paints, glues, sealers, tars, solvents, household cleaners, or photographic reagents;

(iv) stored linoleum, plastics, rubber, tires, or insulated wire;

(v) hazardous waste;

(vi) lead piping;

(vii) plastic piping with an outside diameter of four inches or more; or

(viii) urethane or another plastic foam insulation;

(D) provide public notice consistent with (j) of this section; and

(E) ensure that a fire-service representative is on-site before igniting the structure;

(2) the fire service shall ignite and conduct training on only one main structure and any number of associated smaller structures at a time; examples of associated smaller structures are garages, sheds, and other outbuildings; and

(3) the fire service shall respond to complaints in accordance with (k) of this section.

(i) **Firefighter Training: Fuel Burning.** Unless a greater quantity is approved by the department, a fire service may open burn up to 250 gallons of uncontaminated fuel daily and up to 600 gallons yearly for firefighter training without ensuring maximum combustion efficiency. To conduct this training without prior written department approval, the fire service shall

(1) provide public notice consistent with (j) of this section before burning more than 20 gallons of uncontaminated fuel, unless waived in writing by the department; and

(2) respond to complaints in accordance with (k) of this section.

(j) **Public Notice**. A person required to provide public notice of open burning shall issue the notice through local news media or by other appropriate means if the area of the open burning does not have local news media. The public notice must be issued as directed by the department and must

(1) state the name of the person conducting the burn;

(2) provide a list of material to be burned;

(3) provide a telephone number to contact the person conducting the burn before and during the burn;

(4) for a surprise fire drill, state

(A) the address or location of the training; and

(B) the beginning and ending dates of the period during which a surprise fire drill may be conducted (this period may not exceed 30 days); and

(5) for open burning other than a surprise fire drill, state the expected time, date, and location of the open burning.

(k) **Complaints**. A person required to provide public notice of open burning shall

(1) make a reasonable effort to respond to complaints received about the burn;

(2) keep, for at least 30 days, a record of all complaints received about the burn, including to the extent feasible;

(A) the name, address, and telephone number of each person who complained;

(B) a short summary of each complaint; and

(C) any action the person conducting the open burning took to respond to each complaint; and

(3) upon request, provide the department with a copy of the records kept under (2) of this subsection. (Eff. 1/18/97, Register 141; am 2/28/2015, Register 213; am 3/6/2016, Register 217)

Authority:	AS 46.03.020	AS 46.14.010	AS 46.14.030
	AS 46.03.710	AS 46.14.020	Sec. 30, ch. 74, SLA 1993

AS 46.14.990 DEFINITION.

(2) "ambient air" has the meaning given in 40 C.F.R. 50.1;

40 C.F.R. 50.01 DEFINITION

(e) *Ambient air* means that portion of the atmosphere, external to buildings, to which the general public has access.

18 AAC 50.990 DEFINITIONS.

(15) "black smoke" means smoke having the color of emissions produced by the incomplete combustion of toluene in the double wall combustion chamber of a smoke generator;

(38) "fire service" means a

(A) fire department registered with the state fire marshal under 13 AAC 52.030; and

(B) wildland fire suppression organization within the Department of Natural Resources, United States Forest Service, or United States Bureau of Land Management/Alaska Fire Service;

(47) "impairment of visibility" means any humanly perceptible change in visibility from that which would have existed under natural conditions; in this paragraph, "change in visibility" includes light extinction, atmospheric discoloration, and any other change in visual range, contrast, or coloration;

(65) "open burning"

(A) means the burning of a material that results in the products of combustion being emitted directly into the ambient air without passing through a stack, flare, vent, or other opening of an emissions unit from which an air pollutant could be emitted;

(B) does not include

(i) a campfire;

(ii) a barbecue;

(iii) a ceremonial fire;

(iv) use of a candle;

(v) the use of a cigar, cigarette, or pipe;

(vi) the use of celebratory fireworks;

(67) "organic vapors" means any organic compound or mixture of compounds evaporated from volatile liquid or any organic compound or mixture of compounds in aerosols formed from volatile liquid;

(82) "practical means available" means, when approving the open burning of liquid hydrocarbons produced during oil or gas well testing, that all alternative disposal methods will have been analyzed and, where an environmentally acceptable procedure exists, that procedure will be required;

(86) "putrescible garbage" means material capable of being decomposed with sufficient rapidity to cause nuisance or obnoxious odors;

(89) "reduction in visibility" means the obscuring of an observer's vision;

93) "responsible official" means

(A) for a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or a duly-authorized representative of that person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under AS 46.14 or this chapter, and

(i) the facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million in second quarter 1980 dollars; or

(ii) the delegation of authority to the representative is approved in advance by the department;

(B) for a partnership or sole proprietorship, a general partner or the proprietor, respectively; and

(C) for a public agency, a principal executive officer or ranking elected official; for the purposes of this chapter, a principal executive officer of a federal agency includes the chief executive officer with responsibility for the overall operations of a principal geographic unit in this state;

(99) "smolder" means to burn and smoke without flame;

(114) "uncontaminated fuel" means a hydrocarbon fuel, excluding propane, that does not contain used oil, crude oil, or a hazardous waste;

(Eff. 1/18/97, Register 141; am 6/14/98, Register 146; am 6/21/98, Register 146; am 9/4/98, Register 147; am 11/4/99, Register 152; am 1/1/2000, Register 152; am 2/2/2002, Register 161; am 5/3/2002, Register 162; am 11/15/2002, Register 164; am 8/8/2003, Register 167; am 10/1/2004, Register 171; am 12/3/2005, Register 176; am 12/30/2007, Register 184; am 7/25/2008, Register 187; am 4/1/2010, Register 193; am 12/9/2010, Register 196; am 9/17/2011, Register 199; am 9/14/2012, Register 203; am 10/6/2013, Register 208; am 11/9/2014, Register 212; am 2/28/2015, Register 213; am 4/17/2015, Register 214; am 3/2/2016, Register 217; 1/12/2018, Register 225; am 9/15/2018, Register 227; am 1/8/2020, Register 233; am 11/7/2020, Register 236)

Authority:	AS 44.46.025	AS 46.14.140	AS 46.14.250
	AS 46.03.020	AS 46.14.150	AS 46.14.255
	AS 46.03.710	AS 46.14.160	AS 46.14.280
	AS 46.14.010	AS 46.14.170	AS 46.14.285
	AS 46.14.020	AS 46.14.180	AS 46.14.290
	AS 46.14.030	AS 46.14.210	AS 46.14.300
	AS 46.14.120	AS 46.14.230	AS 46.14.560
	AS 46.14.130	AS 46.14.240	Sec. 30, ch. 74, SLA 1993

18 AAC 50.245.-246 AIR EPISODES AND ADVISORIES.

18 AAC 50.245. Air quality episodes and advisories for air pollutants other than PM-2.5. (a) The department or a local air quality control program may declare an air quality episode and prescribe and publicize curtailment action if the concentration of an air pollutant in the ambient air has reached, or is likely in the immediate future to reach, any of the concentrations established in Table 6 in this subsection.

Table 6.
Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5

Episode Type	Air Pollutant	Concentration in micrograms per cubic meter {and in ppm where applicable}
Air alert	Sulfur dioxide	365 (24-hour average) {0.14 ppm}
	PM-10	150 (24-hour average)
	PM-10 from wood burning (wood smoke control areas)	92 (24-hour average)
	Carbon monoxide	10,000 (8-hour average) {8.7 ppm}
Air warning	Sulfur dioxide	800 (24-hour average) {0.31 ppm}
	PM-10	350 (24-hour average)
	Carbon monoxide	17,000 (8-hour average) {15 ppm}
Air emergency	Sulfur dioxide	1,600 (24-hour average) {0.61 ppm}
	PM-10	420 (24-hour average)
	PM-10 from wood burning (wood smoke control areas)	During an air alert, a concentration measured or predicted to exceed 92 (24-hour average), and to continue to increase beyond the concentration that triggered the air alert
	Carbon monoxide	34,000 (8-hour average) {30 ppm}

(b) The department or a local air quality control program will declare an air quality advisory if, in its judgment, air quality or atmospheric dispersion conditions exist that might threaten public health.

(c) If the department or a local air quality control program declares an air quality advisory under (b) of this section, the department or a local air quality control program will

(1) request voluntary emission curtailments from any person issued a permit under this chapter whose stationary source's emissions might impact the area subject to the advisory; and

(2) publicize actions to be taken to protect public health.

(d) Nothing in this section alters a local government's powers or obligations under a local air quality control program established under AS 46.14.400 and other local laws, as applicable. (Eff. 1/18/97, Register 141; am 10/1/2004, Register 171; am 2/28/2015, Register 213)

Authority:	AS 46.03.020	AS 46.14.020	Sec. 30, ch. 74, SLA 1993
	AS 46.14.010	AS 46.14.030	

18 AAC 50.246. Air quality episodes and advisories for PM-2.5. (a) The department or a local air quality control program may declare an air quality episode and prescribe and publicize the actions to be taken if the concentrations of PM-2.5 in the ambient air has reached, or is likely in the immediate future to reach, any of the concentrations established in Table 6a in this subsection. The episode thresholds and actions prescribed for any area that has a local air quality plan included in the *State Air Quality Control Plan* adopted by reference in 18 AAC 50.030 must be consistent with the emergency episode provisions included in that plan.

Table 6a

Concentrations Triggering an Air Quality Episode for PM-2.5

Episode Type	Air Pollutant	Concentration in micrograms per cubic meter
Air alert	PM-2.5	35.5 (24-hour average)
Air warning	PM-2.5	55.5 (24-hour average)
Air emergency	PM-2.5	150.5 (24-hour average)

(b) The department or a local air quality control program authorized by the department under AS 46.14.400 will declare a PM-2.5 air quality advisory if, in its judgment, PM-2.5 air quality or atmospheric dispersion conditions exist that might threaten public health.

(c) If the department or a local air quality control program declares a PM-2.5 air quality advisory under (b) of this section, the department or a local air quality control program will

(1) request voluntary emission curtailments from any person issued a permit under this chapter whose stationary source's emissions might impact the area subject to the advisory; and

(2) publicize actions to be taken to protect public health.

(d) Nothing in this section alters a local government's powers or obligations under a local air quality control program established under AS 46.14.400 and other local laws, as applicable. (Eff. 2/28/2015, Register 213)

Authority:	AS 46.03.020	AS 46.14.020	Sec. 30, ch. 74, SLA 1993
	AS 46.14.010	AS 46.14.030	

ARTICLE 4. USER FEES.
18 AAC 50.400. PERMIT ADMINISTRATION FEES.

(g) The fee for department review of and routine compliance services for a request for open burning under 18 AAC 50.065 is $230. If the department determines that smoke incursion into a public place, into an airport, into a Class I area, into any nonattainment area, or into any maintenance area is likely, all additional costs will be charged in accordance with (h) of this section.

(h) Unless the designated regulatory service is subject to a fixed fee set out in (a) – (g) of this section, or to the terms of a negotiated service agreement under AS 37.10.052(b) and 18 AAC 50.403, the permittee, owner, or operator shall pay an hourly permit administration fee for a designated regulatory service. The department will calculate the total amount due under this subsection by multiplying the number of hours spent to provide the designated regulatory service by the hourly rate of salary and benefits of the department employees who provided the designated regulatory service, and by adding to the resulting amount any other direct costs.

(Eff. 1/18/97, Register 141; am 6/21/98, Register 146; am 10/1/2004, Register 171; am 12/1/2004, Register 172; am 1/29/2005, Register 173; am 12/30/2007, Register 184; am 7/25/2008, Register 187; am 7/1/2010, Register 194; am 9/14/2012, Register 203; am 9/26/2015, Register 215; am 9/15/2018, Register 227)

Authority:	AS 37.10.050	AS 44.46.025	AS 46.14.140
	AS 37.10.052	AS 46.03.020	AS 46.14.240
	AS 37.10.058		

AREA-WIDE POLLUTANT CONTROL EFFORTS FOR OPEN BURNING

Control of open burning incidences for air pollution is the responsibility of the DEC. Open burning is defined as, "the burning of a material that results in the products of combustion being emitted directly into the ambient air without passing through a contaminant outlet." All open burning in the state, whether requiring written approval from the DEC or not, must be done in a way that maintains maximum combustion efficiency throughout the burning period.

Open burning at landfills is also controlled by solid waste disposal regulations, 18 AAC 60.355. Open burning is prohibited at Class I and II landfills.

MATERIALS THAT CANNOT BE OPEN BURNED:

- Spill absorbents and contaminated soils that are RCRA hazardous waste.
- Pesticides, halogenated organic compounds, cyanic compounds, or polyurethane productsburned in a way that gives off toxic or acidic gases or particulates.
- Putrescible garbage, animal carcasses, or petroleum-based materials burned in a way that causes odor or black smoke that may have an adverse effect on nearby persons or residences.
- Electrical batteries, all types and sizes.
- All liquid-form paints (e.g. in cans).
- Lead-based painted wood debris, if classified as RCRA hazardous waste. For more guidanceconcerning wood with lead-based paint, please contact EPA RCRA office, Diane Richardson, at 907-271-6329.

- All solvents, except those composed of water and soap/detergent solutions.
- All aerosol cans, except that those do not use chloro- or fluoro- carbon propellants.
- Asbestos or any metals or alloys containing beryllium, chromium, cobalt, arsenic, selenium,cadmium, mercury, lead, or any radioactive wastes.
- Any electrical or electronic lamps or components that contain any of the above metals/alloys(including fluorescent, high-pressure sodium, mercury vapor, and metal halide lamps).
- Any plastics or other materials containing chlorine as an essential component (such as Polyvinyl Chloride - PVC pipe). However, empty containers containing salt residue may beburned (salt is any metal chloride used for thawing or ion exchange).
- Tires.
- Treated wood containing compounds such as creosote, napthlate, or tar.

WHO NEEDS WRITTEN APPROVAL?

Certain types of open burning require written approval from the DEC prior to the incident. Theseinclude:

1. Controlled Burning for Land Clearing:

Open burning of woody debris material by farmers and developers requires written DEC approvalif the intent is to clear and burn 40 acres or more per year. DEC will, in its discretion, require public notice. Open burning should be done, as rapidly and safely as other considerations permit, to develop maximum heat energy per unit time and vent the smoke to the highest elevation possible. The burn material should be as dry as possible to create a high heat energy, less smoke,and a more efficient burn. Additional requirements for land clearing burns are outlined in the ESMP.

2. Controlled Burning For Resource Management (Prescribed Burning):

Prescribed burning, intentionally set fires to burn off ground and forest cover, is usually, but not always, done by land management agencies. Prescribed burning is subject to obtaining written DEC approval if the intent is to clear 40 acres or more in a year. DEC will, in its discretion, require public notice. Additional requirements for resource prescribed burns are outlined in the ESMP.

3. Fire Fighter Training:

Fire fighter training using structures or fuels must be conducted pursuant to 18 AAC 50.065(b),(h), and (i) and requires written DEC approval. Public notification is required unless DEC issues a written waiver for burns conducted in remote areas, where the news media is not generally available, or where no public will be affected.

A fire service may ignite and conduct training on only one main structure and its associated smaller structures at a time; examples of associated smaller structures are garages, sheds, and other outbuildings within close proximity to the main structure. Structures must be inspected forhazardous wastes and other nonburnables prior to ignition. Materials listed on the "**MATERIALS THAT CANNOT BE OPEN BURNED**" list (page 9 of this Guidance) are tobe removed from the structure prior to ignition.

A fire service may open burn up to 250 gallons of uncontaminated fuel daily and up to 600 gallons yearly for fire fighter training without prior DEC approval, provided that the fire service give public notice of the event before burning more than 20 gallons of fuel and responds to complaints in accord with 18 AAC 50.365(j) and (k) respectively.

Fire fighter training shall be conducted pursuant to 18 AAC 50.065(b) and (h) and is subject to written DEC approval. Public notification is required according to 18 AAC 50.065(j).

4. Burning Materials that Produce Black Smoke:

Open burning of petroleum-based materials, asphalt, rubber products, or other materials in a way that give off black smoke is subject to obtaining written DEC approval. In addition, DEC will, in its discretion, require public notice.

Open burning should be done using reasonable procedures to minimize adverse environmental effects and limit the amount of smoke generated.

Open burning of oil or gas well flow tests must conform to 18 AAC 50.065(b)(1) and the guidance contained in the In situ Burning Guidelines for Alaska. DEC intends to eliminate open burning of liquid hydrocarbons because alternative measures are generally available. If alternatives become unusable because of equipment breakdown or inclement weather, such events do not constitute the non-availability of alternatives.

OPEN BURNING PROHIBITION:

Open burning can be prohibited on an area-by-area basis if DEC issues an air quality advisory covering the area of concern. This advisory can be for a maximum of twenty-four hours but may be renewed daily. The advisory will be based on an assessment that inadequate air ventilation is available which would inhibit the dispersal of pollutants, such as inversions and low wind speeds.

AWFCG Alaska Fire Restriction Levels

The purpose of this document is to provide a uniform statewide system to aid fire staff in proposing and communicating local, state, and federal fire restrictions to the public in Alaska.

This interagency document is a reference guide to clarify the definitions of fire use for the public relative to general restriction levels.

Agency contacts must be identified annually to coordinate fire restrictions for their respective agency land ownership, to obtain approval within their agency, and coordinate public outreach. The contact list will be disseminated at the AWFCG Spring Operations meeting each March. Public outreach and messaging must clarify, as needed, that open burning activities may require compliance with regulations from multiple agencies within one geographic area.

Designated Area of Restrictions

Fire restrictions are implemented based on fire indices and corresponding fire danger levels with consideration for preparedness levels, resource availability, land use status, and socio-political concerns. They may be implemented statewide or directed at specific areas. Cooperating agencies will coordinate to identify the boundaries of temporal fire restriction levels prior to disseminating specific restrictions to the public. Whenever possible, fire restriction boundaries should be commonly known geographic features or administrative boundaries that are easily communicated to the public through multiple media channels including verbal and visual methods. See Appendix A for the agency contact list.

Legal Authorities

Individual agencies remain responsible for implementing restrictions within their jurisdiction according to their own policies and procedures. Generally, the authority to implement or rescind fire restrictions resides with an agency administrator or other public official, and fire staff are responsible for coordinating the level of restriction needed and outreach to the public. Reference Alaska Fire Restrictions at https://dec.alaska.gov/air/anpms/alaska-fire-restrictions/ for the statewide compilation by jurisdiction. Reference the Alaska Interagency Wildland Fire Management Plan’s Table 1. Alaska Jurisdictional Agencies based on Ownership / Land Status.

Restriction Levels

The restriction levels are relative categories used for the application of fire restrictions when multiple agencies are experiencing very high to extreme fire danger and/or limited resource availability across a large geographic area. These levels are not defined by statute or regulation. Designation of the level is made by agreement between agency authorities and line officers recommending protections.

Table A outlines what activities are prohibited and allowed during the levels of restrictions. All activities listed here are subject to private, local, state, federal, and native trust burning requirements and limitations.

Table A – Restrictions Table

Activity	No Restrictions	Level 1	Level 2	Level 3	Notes/Reference
Burning of brush/debris piles, use of burn barrels, burning of lawns, and other types of open burning which may be regulated under a state or local burn permitting system.	**Allowed [1]**	**Prohibited**	**Prohibited**	**Prohibited**	[1]Subject to landowner, Alaska DNR, Alaska DEC, and local permitting requirements and limitations. This activity is generally prohibited on federally administered lands but subject to local jurisdiction approval.
Campfires in unimproved or dispersed camp sites, such as gravel bars, beaches, and remote/backcountry locations.	**Allowed**	**Prohibited**	**Prohibited**	**Prohibited**	
Campfires in designated campgrounds and fire rings.	**Allowed**	**Allowed[2]**	**Prohibited**	**Prohibited**	[2]In Level 1, campfires must be 3 feet or less in diameter with flame lengths no more than 2 feet high.
Cooking and warming devices that operate using charcoal briquets, wood pellets, or any other exposed fuel source that cannot be immediately shut off via a commercially manufactured and installed off/on switch or fuel flow shut off valve.	**Allowed**	**Allowed**	**Prohibited**	**Prohibited**	
Commercially manufactured cooking and warming devices that can be immediately shut off with an installed off/on switch or fuel flow shut off valve.	**Allowed**	**Allowed**	**Allowed**	**Prohibited**	
Any other activity that may involve the use or creation of an open flame for burning including: DEC approved waste disposal sites, gas and oil flares, outdoor shooting ranges, live fire training undertaken by a registered fire department, outdoor licensed food vendors, etc.	Shall be at the discretion of the government agency having jurisdictional oversight.				

The sale and personal and/or commercial use of fireworks	Subject to borough or municipality ordinance and landowner restrictions. If none apply, under all Levels it shall be at the discretion of the State Fire Marshal's office in areas where the DNR has declared the wildfire danger to be high, very high, or extreme, or there are depleted firefighting resources (Reference 13AAC 50.025 and International Fire Code 5608.11.14).

BURN PLAN APPROVAL GUIDELINES

APPROVAL ISSUANCE:

Volume II, Section III-F of the Alaska Air Quality Control Plan incorporated by reference under18 AAC 50.030 lists the requirements for obtaining approval to open burn. DEC has up to 30 days to issue an approval. Written approval is not automatic but must be evaluated for conformance with the following guidelines.

A contingency plan should be prepared in case of unforeseen changes in weather or other uncontrollable parameters that would affect your burn and the resultant smoke. Persons with approval must curtail their fire if air in the area is becoming overloaded or local weather factorswould create smoke problems, even though no other restrictions have been imposed (i.e. windmoving directly into sensitive areas, inversions, etc.).

If any safety hazard is present, you must extinguish the fire as soon as possible. You will be held legally responsible for any accident or adverse health effects that occur because of your open burn.

The guidelines of a burn plan should include the following:

1. **Indicate the location, duration, and inclusive dates considered for the burn**

   Provide a legal description or latitude and longitude of the location to be burned and the expected duration of both single events and the entire burning project. Minor changes or additional information for the burn plan can be discussed at the time DEC is notified by phone. At a minimum, the applicant is required to call DEC by noon at least one working day prior to ignition. Call the number listed in the Open Burn Approval Letter.

2. **Identify the location of all sensitive features that might be impacted by smoke**

   The Responsible Authority should identify on a map all sensitive features, which include population centers such as communities, cities, towns, hospitals, health clinics, nursing homes, schools (in session), campgrounds, numbered Alaska highways and roads, airports, Prevention of Significant Deterioration Class I areas, and any other areas where smoke and air pollutants can adversely affect public health, safety, and welfare.

3. **Indicate how the public will be informed prior to, during, and after the burning**

The best way to avoid complaints is to make sure everyone around the burn area knows when the burn will occur so they can take steps to avoid the smoke. The Responsible Authority's local contact phone number should be publicized so the public can contact you. The public must be notified at least three days prior to the anticipated burn through the local news media or the local Post Office.

4. Indicate how coordination with other concerned agencies, including the Responsible Authorities of sensitive features, will be carried out

Indicate how all concerned agencies will be notified prior to ignition, , including authorities in control of sensitive features identified in item 2 (such as the FAA, State Troopers, military, fire department, adjacent land managers, etc.) who are potentially affected by impaired visibility or adverse smoke impacts. Include a list of telephone numbers or email addresses of agencies that must be contacted prior to ignition.

The Department of Natural Resources, Division of Forestry (DOF) also issues burn permits; contact DOF to determine what requirements apply. The DOF burn permits arein addition to DEC burn approvals and address fire safety and other issues.

5. Indicate the source of the weather forecast and how it will be used to prevent smoke impacts

Identify how the local and spot weather forecast will be obtained (e.g., through the NWS)prior to ignition of the controlled burn. Parameters that should be obtained are the predicted visibility, dispersion conditions, wind direction, and wind speed.

6. Indicate how weather changes will be monitored and what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition

Indicate how the weather will be monitored throughout the controlled burn. Identify what actions will be taken if a wind shift or other weather change begins to create an adverse smoke impact on sensitive features identified in Item 2. For example, if an inversion is expected to occur during the night, active ignitions could be ceased.

If any safety hazard is present as a result of smoke, or if requested by the authority of a sensitive feature, all technologically feasible and economically and environmentally reasonable steps to mitigate smoke impacts must be taken.

7. Indicate what will be done to validate predicted smoke dispersion

Indicate how smoke dispersion will be predicted. If a recommended method (test fire, small piles or areas, etc.) fails to indicate that acceptable smoke dispersion will occur, no fires will be ignited.

8. Indicate proposed techniques to be used to enhance the active fire phase and reduce the smoldering phase

Consider employing emission reduction techniques (Appendix D) to enhance the activefire phase and reduce smoldering, and indicate what is feasible to accomplish the burn objectives.

9. Indicate how authorities in control of sensitive features will be contacted if visibility decreases

Provide a contingency plan (Appendix E) for smoke intrusion into populated areas, Class I areas, or other smoke sensitive features as notified in item 2. Authorities having control over sensitive features identified in item 2 must be notified if visibility is expected to be decreased to less than three miles for an hour. Indicate how authorities of sensitive features will be notified if this occurs. If any safety hazard is present, or if requested by the authority of a sensitive feature, impacts must be mitigated through steps that are technologically feasible and economically and environmentally reasonable. Contingency or emergency monitoring may be needed to measure and detect smoke intrusions on sensitive features.

10. Identify alternative disposal options for material being controlled burned

An evaluation of alternatives to controlled burning (Appendix F) must demonstrate that controlled burning is the only technologically feasible and economically and environmentally reasonable alternative. Identify other alternative disposal options for material burned (e.g., marketing timber with a lumber company), why burning is the selected alternative and why the alternatives were not used; or list any alternatives to burning that have been done to the burn units prior to ignition.

11. Indicate how coordination with air quality authorities having jurisdiction will take place

At a minimum, notify DEC by telephone by noon one business day prior to ignition. Call the number listed in the Open Burn Approval Letter. Include the 11 items in Section 2.2. If a multiple day burn is planned, the responsible authority need only call before the first ignition day. A call to DEC after a multiple day burn is completed is requested. If the burn is not conducted, please notify DEC within 24 hours to schedule a new burn date.

12. Indicate the type of vegetation to be burned, pre-burn and post-burn fuel loading estimates, and ignition technique to be used

Pre-burn fuel loading represents the amount of fuel present at the burn location (to be consumed) and should be expressed as the weight of fuel per unit area in tons per acre. The post-burn loading estimate represents the fuel remaining after the burn. The ignition technique should describe the method (e.g., hand ignition, drip torch, helitorch) and technique (e.g., strip head fire, backing fire, etc.)

13. For prescribed fires, indicate whether the fire is needed for land management purposes.

The RH Rule allows the state to adjust its uniform rate of progress towards "natural visibility" and deduct wildfire and prescribed fire emissions (wildland prescribed fires) that were conducted with the objective to establish, restore, and/or maintain sustainable and resilient wildland ecosystems; to reduce the risk of catastrophic wildfires; and/or to preserve endangered or threatened species during which appropriate basic smoke management practices were applied.[13]

14. **Provide the approximate emissions expected for each burn and method used to estimate.** Note: Emission estimates for Land Clearing Burns will be calculated by DEC.[1]

    Emissions can be estimated by multiplying the amount of fuel consumed (usually expressed in tons), by an emission factor expressed in pounds per ton of fuel. Emission factors can be found on EPA's website at http://www.epa.gov/ttn/chief/ap42/ch13/. Other emission factors or methods may also be used, including, but not limited to: CONSUME, FEPS, FOFEM, PFEP, and SASEM (Appendix D).

15. **Air monitoring to be conducted**

    Identify how the burn may affect or potentially impact air quality at smoke sensitive features, and how the visibility in Class I areas will be monitored (Appendix G). If the burn will not adversely affect visibility in a Class I area, state that there is low potential of the burn impacting visibility in a Class I area and that monitoring will not be conducted.

[1] http://www.wrapair.org/forums/fejf/docs.html

[13] 51.308 (f)(vi) (B)

Appendix C

Open Burning Approval Applications

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF AIR QUALITY, AIR PERMITS PROGRAM
Anchorage Compliance Office Supervisor

555 Cordova Street

Anchorage, AK 99501

OPEN-BURNING APPROVAL APPLICATION

Controlled Burning for Resource Management

Prescribed burning, intentionally setting fires to burn off ground and forest cover, is usually, but not always, done by land management agencies. Prescribed burning requires written DEC approval before starting the burn if the intent is to burn, or clear and burn ***a total of 40 acres or more during a year.***

When conducting prescribed burning, Permit Holders shall follow the Enhanced Smoke Management Plan (ESMP). The ESMP is an agreement and program plan developed and agreed upon by the Alaska Wildland Fire Coordinating Group. The purposes of the ESMP is to mitigate the nuisance, health and safety hazards to transportation, such as, roadway and airport visibility impairment, smoke sensitive features (such as hospitals, schools, and clinics) posed by smoke intrusions into populated areas; to prevent deterioration of air quality and Alaskan Ambient Air Quality Standard violations; and to reduce visibility impacts in mandatory Class I Federal Areas in accordance with Regional Haze Rules.

Note: Please type or cut/paste your responses into the appropriate cells; the cells will expand as required.

Person(s) Responsible:

Project Contact:		Phone Number:	

Land Owner:		Fire Manager:		Applicant:	
Mailing Address:		Mailing Address:		Mailing Address:	
Phone Number:		Phone Number:		Phone Number:	

Emergency contact number(s) in case of smoke intrusion:

Name (1st Priority):		Name (2nd Priority):		Name (3rd Priority):	
Title / Agency		Title / Agency:		Title / Agency:	
Primary contact Phone #:		Primary contact Phone #:		Primary contact Phone #:	

Cell or other contact #:		Cell or other contact #:		Cell or other contact #:	

1. LOCATION AND DATES OF PROPOSED BURN		
Indicate the location, duration, and inclusive dates considered for the burn:		
Legal Description of Burn Site(s)[1]:		
Physical Location of Burn Site(s):		
Latitude/Longitude of Burn Site(s)[2]:		
Anticipated Burn Date(s):		Anticipated Duration of Each Event:

1. Include approximate coordinates derived from the Public Land Survey System using township, range and section numbers.
2. If unable to provide legal description, provide Latitude and Longitude of burn in decimal degrees.

2. BURN SUMMARY			
Location of Burn (please check):			
	KP = Kenai Peninsula		DJ = Delta Junction
	SE = Southeast		AL = Aleutian (inc. Kodiak, Iliamna)
	MS = Mat-Su Borough		FBX = areas north of Talkeetna
	OL = Other Location, please specify:		

One time event? (yes or no)			Multiple Events? (yes or no)	
Total acreage to be burned and/or cleared and burned:				
Acreage to be burned in piles (yes or no)				
Acreage to be burned per event (if applicable):				
Permit Approval Requested Length:		1 Year		Multi-Year
If a multi-year permit approval is requested, indicate which portions of the projects will be burned during each of the following years. Multi-Year permits will require a renewal application each year and are subject to the same fee. Attach a map as necessary to further indicate where/when burning will occur.				

Indicate the type of vegetation to be burned (please check):			
	1 = Broadcast, forested, not piled, heavy		4 = Machine piled slash
	2 = Range/tundra		5 = Hand piled slash
	3 = Grass		6 = Understory burns, brush

Pre-burn and post-burn fuel loading estimates:	
Size class (inches diameter):	Tons/acre (estimated):
0.00 to 0.25	
0.25 to 1.00	
1.00 to 3.00	
3.00 to 9.00	
Live Crown Mass	
Above Ground Mass	
Duff Layer (DMC, DC)	
Total:	
Ignition techniques to be used (please describe):	

3. SMOKE MANAGEMENT			
Have you developed a Smoke Management Plan for this burn (please check)?			
	Yes (Please attach and show ratings below)		No [Complete Attachment 1 (Smoke Complexity) and provide ratings below]

The Smoke Management Complexity ratings for this open burn are (check appropriate category):						
Risk:		Low (1 point)		Moderate (2 points)		High (3 points)
Potential Consequences:		Low (1 point)		Moderate (2 points		High (3 points)
Technical Difficulty:		Low (1 point)		Moderate (2 points		High (3 points)

Complete Attachment 2 (Public Health Impact Complexity) included with this application. Summarize the Smoke Management Public Health Impact Complexity below (check appropriate category):						
Risk:		Low (1 point)		Moderate (2 points)		High (3 points)
Potential Consequences:		Low (1 point)		Moderate (2 points		High (3 points)
Technical Difficulty:		Low (1 point)		Moderate (2 points		High (3 points)

Indicate the overall Smoke Management / Public Health Impact Complexity Rating Score for this burn (i.e., the total score of the above six ratings points): *Overall rating may be reduced through smoke mitigation efforts outlined in the complexity rating descriptions.*							
Revised overall smoke /health complexity rating with mitigation applied:		Low (6-8 points)		Moderate		High	

				(8-12 points)		(>12 points)

Indicate whether the fire is is needed to manage natural resource objectives and whether it is located on "wildlands". **Define the natural resource objectives of this burn activity:** **Frequency of prescribed fire at this location and provide date for last burn activity**
Definitions: **Prescribed fire** is "any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific land or resource management objectives." 40 CFR 50.1(m)
Wildfire is "any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental human-caused actions, or a prescribed fire that has developed into a wildfire" (emphasis added). ***Wildland*** is "an area in which development is essentially non-existent, except for roads, railroads, powerlines, and similar transportation facilities. Structures, if any, are widely scattered." Land within national parks, national forests, wilderness areas, state forests, state parks, and state wilderness areas are generally considered wildland. Land outside cantonment areas on military bases may also be considered wildland.

4. SENSITIVE FEATURES ***Sensitive Features*** *include population centers such as communities, cities, towns, hospitals, health clinics, nursing homes, schools (in session), camp grounds, numbered Alaska highways and roads, airports, Prevention of Significant Deterioration Class I Areas, nonattainment areas, where smoke and air pollutants can adversely affect public health, safety, and welfare.*
Include a map of the proposed burn area. a. Indicate multiple burn sites (if any) within the proposed burn area; b. List sensitive features as described below that may be adversely affected by low level smoke and distance of those areas from proposed burn area(s); c. List sensitive features that may be adversely affected long range transport of smoke and distance of those areas from proposed burn area(s).

How many maps are attached?	

5. MITIGATION: *If any safety hazard is present, or if requested by the authority of a Sensitive Feature, you must mitigate impacts through steps that are technologically feasible and economically and environmentally reasonable. Contingency or emergency monitoring may be needed to measure and detect smoke intrusions on Sensitive Features. Failure to have an effective mitigation measure may, in some cases, result in the application not being approved.*				
Indicate how authorities in control of Sensitive Features will be contacted if air quality degrades (visibility may be used as an indicator of air quality). Provide a contingency plan for smoke intrusion into Sensitive Feature areas. Indicate how you will notify Authorities having control over Sensitive Features identified above if visibility is expected to be decreased to less than three miles for an hour.				
Have you reviewed the ADEC Smoke Management Plan? y/n				
Is the burn expected to generate low level smoke, transported locally?		Yes		No
If yes, could people coming into the proposed burn locality be adversely affected by smoke?		Yes		No
If yes, what mitigation practices / contingency plans are proposed to help keep the smoke from affecting Sensitive Features near to the burn site?				
Is the burn expected to be large enough (>1000 acres) or hot enough to create a smoke plume that is transported to upper level air currents?		Yes		No
If yes, what mitigation practices / contingency plans are proposed to help keep the smoke from affecting Sensitive Features far from the burn site?				

6. PUBLIC NOTICE *The Responsible Authority's / Fire Manager's local contact phone number should be publicized. The public must be notified at least three days prior to the anticipated open burn through the local news media or the local Post Office.*
Indicate how the public will be informed prior to, during, and after the burning. How will you notify persons in control of the sensitive features identified on your map of your anticipated burn?

Indicate how you will coordinate with other concerned agencies, including the Responsible Authorities of sensitive features identified above *(such as the FAA, State Troopers, military, fire department, adjacent land managers, etc.)* Include a list of telephone numbers or email addresses of agencies you will contact prior to ignition.

Indicate how you will coordinate with DEC Air Quality. *At a minimum, the DEC Meteorologist must be notified two (2) weeks prior to anticipated project ignition (907-269-7676). If your application is approved, a conference should be scheduled for 24 - 96 hours prior to the actual burn, or by noon the business day prior to scheduled burns to be conducted during the weekend for a burn-weather call.*

Attach a copy of your approval for the DNR - Forestry Division Large Scale Permit for your planned activity, or explain below why a DNR Burn Permit is not required.

7**. METEOROLOGICAL / WEATHER FORECASTING** *The Division's meteorologist is responsible for ensuring, from the Department's standpoint, that smoke from a prescribed burn does not adversely impact the public. To allow their participation in the burn decision making process, please ensure that this application is completed and submitted at least 2 weeks prior to a scheduled burn so they can participate in pre-burn planning events 1-2 days prior to ignition.*
Indicate how weather forecasts will be obtained and used to prevent smoke impacts. Identify how the local and spot weather forecast will be obtained prior to ignition of the open burn. *Parameters that should be obtained are the predicted visibility, dispersion conditions, transport and local area wind direction, and wind speed.*

Indicate how weather changes will be monitored.

Explain what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition. *If any safety hazard is present, or if requested by the Authority of a Sensitive Feature, you must take technologically feasible and economically and environmentally reasonable steps to mitigate smoke impacts.*

Identify what you will do if a wind shift or other weather change begins to create an adverse smoke impact on Sensitive Features previously.

Indicate what will be done to validate predicted smoke dispersion. Note: If a test fire, small piles or areas fire, etc. fails to indicate that acceptable smoke dispersion will occur, no fires are to be ignited.

Indicate proposed techniques to be used to enhance the active fire phase and reduce the smoldering phase. Consider employing emission reduction techniques before, during and after the fire. Indicate what is feasible to address the management objective.

Will air monitoring be conducted during the burn (check applicable boxes)?	
	No, monitoring will not be conducted during the burn. Explain why air quality monitoring for particulates should not be necessary for this burn.
	Yes, monitoring will be conducted. Describe the numbers and placement of monitors to be used, how often the data will be collected / stored, how the results will affect the burn operations, and where the monitoring data can be accessed by DEC staff.

Identify how the effect of the fire on air quality at Sensitive Features, and visibility in Class I areas will be monitored.		
The applicant will supply monitoring equipment and personnel *(Check Yes or No)*	YES	
	NO	
The applicant requests DEC supply monitoring equipment and personnel, and acknowledges that time and materials will be charged for DEC services *(Check Yes or No)*	YES	
	NO	

8. OTHER DISPOSAL OPTIONS
Identify alternative disposal options for material being open burned. *An evaluation of alternatives to open burning must demonstrate that open burning is the only technologically feasible and economically and environmentally reasonable alternative.*

Identify other alternative disposal options for material burned or explain why burning is the selected alternative and why the alternatives were not used.

List any alternatives to burning that have been done to the burn units prior to ignition.

Certification: (If signing as an Authorized Agent, please submit a copy of your authority to do so.)

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.

Landowner Signature Date	Fire Manager Signature Date	Applicant Signature Date
Printed Name of Landowner	Printed Name of Fire Manager	Printed Name of Applicant

As of September 26, 2015, the fee for review of and routine compliance services for a request for Open Burning Approval is $230. With each burn application please submit a $230 administrative fee payable to the State of Alaska, DEC. If the department determines that a smoke incursion is likely as per 18 AAC 50.400(g), any additional costs will be billed on an hourly basis in accordance with 18 AAC 50.400(h). The applicant will be notified that DEC will charge an hourly administrative fee and direct costs for approval processing and administration. DEC will prepare and send a monthly invoice itemizing fees and direct costs to the applicant.

Send each open burn application and check to:

ADEC Air Permits Program
Anchorage Compliance Office Supervisor
Open Burn Request
555 Cordova Street
Anchorage, AK 99501

Your approval may be issued within 30 days (or sooner). If approved, notification and burn summary requirements will be outlined in your letter of approval.

A copy of the open burning guidelines may be obtained through our website:
https://dec.alaska.gov/air/air-permit/open-burn-info

Attachment 1

Prescribed Fire Complexity Rating System Guide

Smoke Management – Risk		
	Low	Smoke concerns are generally few or easily mitigated. The project will produce smoke for only a short period of time or is barely visible to the public. Smoke exposure or amounts are not expected to cause health or safety concerns to project personnel or the public. Members of the public have expressed few or no concerns about smoke.
	Moderate	Smoke concerns are moderate and some concerns require special mitigation. The project will produce smoke visible to the public over several days. Smoke exposures or amounts may cause some health or safety concerns over a short period of time. Members of the public have expressed some concerns about smoke.
	High	Smoke concerns are high and require special and sometimes difficult mitigation. Smoke will be readily visible to the public and last several days to weeks. Smoke exposures or amounts are likely to cause some health and safety concerns that will require special mitigation. Large segments of the public are concerned about smoke.

Smoke Management - Potential Consequences		
	Low	No impacts OR minor impacts to isolated residences, remote roads or other facilities are expected. Firefighter exposure to smoke is expected to be minimal and not cause health and safety concerns.
	Moderate	Vistas, roads, and some residences may experience short-term decreases in visibility. A few health related complaints may occur. Minor smoke intrusions may occur into smoke sensitive areas, but below levels that trigger regulatory concern. Project personnel may be exposed to dense smoke for short periods of time.
	High	Vistas, roads, and residences may experience longer-term decreases in visibility OR significant decreases in visibility over the short-term. Major smoke intrusions may occur into smoke sensitive areas, such as Class I airsheds, non-attainment areas, hospitals, and / or major airports, at levels that trigger regulatory concern. Project personnel may be exposed to dense smoke for prolonged periods of time.

Smoke Management - Technical Difficulty		
	Low	No special operational procedures are required. Limitations on wind direction, season, etc. may be present in the plan. No mitigation efforts are deemed necessary
	Moderate	Some considerations are needed in the prescription OR ignition portions of the plan. Burn window / opportunities are reduced by the required weather / dispersion conditions. Normal coordination with air quality officials is required. Some mitigation measures or additional smoke modeling may be needed to address potential concerns with smoke impacts. Specific smoke monitoring may be required to determine smoke plume heights

		and directions. Rotating project personnel out of dense smoke is necessary but easy to accomplish. Some mitigation efforts can be used and will be placed into effect as necessary.
	High	Special considerations are needed in the prescribed fire plan. Special smoke management techniques will be used. Burn window / opportunities are limited by the required weather / dispersion conditions. Special coordination with air quality officials is required. Accelerated mop up may be planned to reduce smoke impacts. Some mitigation measures or additional smoke modeling are required to address potential concerns with smoke impacts. Specific smoke monitoring is required to determine smoke plume heights and directions. Rotating project personnel out of dense smoke is necessary but may be difficult to accomplish. Mitigation efforts can be used, but are difficult or will not be applied.

Attachment 2

DEC Smoke Management Public Health Impact Complexity Rating System Guide

Smoke Management Public Health Impact – Risk		
	Low	Smoke will not extend into local communities or travel aloft to distant communities. Health risk minimal.
	Moderate	Smoke will be in and around the public with some potential impact to sensitive individuals.
	High	Smoke would impact communities in the vicinity of the fire or in the distance which will probably require healthy and sensitive individuals to take precautionary actions.

Smoke Management Public Health Impact - Potential Consequences		
	Low	Little impact on public health. No one expected to require hospitalization.
	Moderate	Some impact anticipated. Sensitive individuals may need to take action to protect themselves.
	High	The public will be impacted by smoke from this fire. Sensitive people and some healthy individuals will most probably be impacted and require medical attention or be required to take direct precautionary action such as staying indoor, using an air filtration system or taking medicine.

Smoke Management Public Health Impact - Technical Difficulty		
	Low	No special operational precautions or advisories require to protect public health.
	Moderate	Further consideration of operational actions will need to be undertaken to ensure protection of potentially impacted public. Monitoring will need to be planned and samplers deployed for potential use in protecting the public.
	High	Action will be required to protect public health. Monitoring will be necessary. Samplers will be set up and operated and advisories issued if smoke levels exceed EPA air quality thresholds.

Open Burn Approval Application for Controlled Burning for Land Clearing

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF AIR QUALITY, AIR PERMITS PROGRAM

Anchorage Compliance Office Supervisor

555 Cordova Street

Anchorage, AK 99501

OPEN-BURNING APPROVAL APPLICATION

CONTROLLED BURNING FOR LAND CLEARING

Open burning of woody debris material by farmers and developers requires written DEC approval before lighting if the intent is to burn, or clear and burn, 40 acres or more during a year.

When conducting land clearing or agricultural burning, landowners and/or developers are encouraged to follow the Enhanced Smoke Management Plan (ESMP). The ESMP is an agreement and program plan developed and agreed upon by the Alaska Wildland Fire Coordinating Group. The purposes of the ESMP are to mitigate the nuisance, health and safety hazards to transportation and smoke sensitive features posed by smoke intrusions into populated areas; to prevent deterioration of air quality and Alaskan Ambient Air Quality Standard violations; and to reduce visibility impacts in mandatory Class I Federal Areas in accordance with Regional Haze Rules.

Transportation concerns include roadway and airport visibility impairment; smoke sensitive features include hospitals, schools, clinics and etc.

Note: Please type or cut/paste your responses into the appropriate cells; the cells will expand as required.

Person(s) Responsible:

Project Contact:		Phone Number:	

Land Owner:	
Mailing Address:	

Physical Address:	
Phone Number:	

If the fire is being actively managed by someone other than the land owner, please provide their name and phone numbers:

Name:			
Phone Number:		Cell phone number:	

Emergency contact number(s) in case of smoke intrusion:

Name:	
Title / Agency	
Primary contact Phone #:	
Cell or other contact #:	

1. LOCATION AND DATES OF PROPOSED BURN		
Indicate the location, duration, and inclusive dates considered for the burn:		
Legal Description of Burn Site(s)[1]:		
Physical Location of Burn Site(s):		
Latitude/Longitude of Burn Site(s)[2]:		
Anticipated Burn Date(s):		Anticipated Duration of Each Event:

1. Include approximate coordinates derived from the Public Land Survey System using township, range and section numbers.
2. If unable to provide legal description, provide Latitude and Longitude of burn.

2. BURN SUMMARY			
Location of Burn (please check below). Please include a general map of the area showing where the burn is in relation to the nearest community or communities.			
	KP = Kenai Peninsula		DJ = Delta Junction

	SE = Southeast		AL = Aleutian (inc. Kodiak, Iliamna)
	MS = Mat-Su Borough		FBX = areas north of Talkeetna
	OL = Other Location, please specify:		

	One time event? (yes or no)		Multiple Events? (yes or no)
Total acreage to be burned and/or cleared and burned:			
Acreage to be burned per event (if applicable):			
Estimated number of piles/berms:			
Estimated composition of piles/berms:			
Estimated pile/berm size:			
Do piles/berms contain less than 5% non-combustibles (such as soil, snow, or ice)?			
Are piles/berms longer than 1000 feet without a fire break?			
Are piles/berms loosely stacked to allow for natural draft?			
Have the piles/berms been cured for one year prior to ignition?			
How do you propose to extinguish the piles/berms if necessary? (ie. excessive smoke)			
Estimated time needed to complete the burning activities.			

Permit Approval Requested Length:		1 Year		Multi-Year
If a multi-year permit approval is requested, indicate which portions of the projects will be burned during each of the following years. Multi-Year permits will require a renewal application each year and are subject to the same fee. Attach a map as necessary to further indicate where/when burning will occur.				

Indicate the type of vegetation to be burned (please check):			
	1 = Broadcast, forested, not piled, black spruce, shrub		5 = Hand piled slash
	2 = Broadcast, forested, not piled, white spruce		6 = Grassland / crop field
	3 = Range/tundra		7 = Other (explain below)
	4 = Machine piled slash		
Describe ignition techniques to be used:			
Note: DEC will calculate the emissions from this burn from the information included in the application.			

3. OTHER DISPOSAL OPTIONS
Identify alternative disposal options for material burned (such as marketing timber) and explain why they were not used. *An evaluation of alternatives to open burning must demonstrate that open burning is technologically economically, and environmentally the best alternative.*
List any alternatives to burning that have been done to the burn units prior to ignition.

4. SENSITIVE FEATURES	
***Sensitive Features** include population centers such as communities, cities, towns, hospitals, health clinics, nursing homes, schools (in session), camp grounds, numbered Alaska highways and roads, airports, and Class I Areas, nonattainment areas, where smoke and air pollutants can adversely affect public health, safety, and welfare.*	
Include a map of the proposed burn area. a. Indicate multiple burn sites (if any) within the proposed burn area; b. List sensitive features as described above that may be adversely affected by low level smoke and distance of those areas from proposed burn area(s); c. List sensitive features that may be adversely affected by long range transport of smoke and distance of those areas from proposed burn area(s).	
How many maps are attached?	

5. SMOKE MANAGEMENT

DEC's primary goal is to manage smoke to mitigate impacts on public health and visibility. Depending upon the potential for smoke incursions, special mitigation procedures may be required. The State of Alaska uses the following chart from Montana to relate visibility, as impacted by smoke, with air quality concentrations: *http://deq.mt.gov/Air/CurrentAQ/visibilityranges* **If you have questions while completing the Smoke Management portion of the application, please contact DEC for assistance.**

Out of each group of 3 or 4 statements relating to smoke management issues, please check the one that most accurately describes your land clearing open burn:

☐ The project will only produce smoke for less than 1 day. No smoke related impacts to remote residences, roads, or other facilities.

☐ The project will produce smoke for 1 - 3 days or the smoke will be barely visible to the public. Minor or no smoke related impacts to isolated residences, remote roads or other facilities.

☐ The project will produce smoke visible to the public over 4 - 7 days. Vistas, roads, and some residences may experience short-term decreases in visibility.

☐ The smoke will be readily visible to the public and last more than 7 days. Vistas, roads, and some residences may experience longer-term decreases in visibility or significant decreases in visibility over the short-term. Smoke may affect smoke sensitive areas.

- -

☐ Smoke will not extend into local communities or travel aloft to distant communities. Little impact expected on public health from smoke.

☐ Smoke will be around the public with potential impact to sensitive individuals who may need to take action to protect themselves.

☐ Smoke will impact communities in the vicinity of the fire or in the distance - the public will be impacted by smoke from this fire. Sensitive people and some healthy individuals may be required to take precautionary actions or need medical attention.

- -

☐ No special operational precautions required to protect public health.

☐ Consideration of operational actions will need to be undertaken to ensure protection of potentially impacted public.

☐ Action will be required to protect public health; air quality monitoring will be necessary.

- -

No operational difficulties (wind direction, weather)

are expected. Burn window(s) may be reduced by

weather / dispersion conditions.

Burn window opportunities are limited by weather / dispersion conditions. Accelerated mop up may be planned to reduce smoke impacts.

☐	I do not know what smoke impacts my fire will cause, please provide assistance.

<table>
<tr><td colspan="5">6. MITIGATION:
If any safety hazard is present, or if requested by the authority of a Sensitive Feature, you must mitigate impacts through steps that are technologically feasible and economically and environmentally reasonable. Failure to have an effective mitigation measure may, in some cases, result in the application not being approved.</td></tr>
<tr><td colspan="5">Indicate how authorities in control of Sensitive Features will be contacted if air quality degrades (visibility may be used as an indicator of air quality). Provide a contingency plan for smoke intrusion into Sensitive Feature areas. Indicate how you will notify Authorities having control over Sensitive Features identified above if visibility is expected to be decreased to less than three miles for an hour.</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td colspan="5">What mitigation practices / contingency plans are proposed to help keep the smoke from affecting Sensitive Features near to the burn site?</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>Is the burn expected to be large enough (>1000 acres) or hot enough to create a smoke plume that is transported to upper level air currents?</td><td></td><td>Yes</td><td></td><td>No</td></tr>
<tr><td colspan="5">If yes, what mitigation practices / contingency plans are proposed to help keep the smoke from affecting Sensitive Features far from the burn site?</td></tr>
<tr><td colspan="5"></td></tr>
</table>

<table>
<tr><td>7. PUBLIC NOTICE
The Responsible Individual’s local contact phone number should be publicized. The public must be notified at least three days prior to the anticipated open burn through the local news media, the local Post Office, or by individual communication (written documentation is best).</td></tr>
<tr><td>Indicate how the public will be informed prior to, during, and after the burning. How will you notify persons in control of the sensitive features identified on your map of your anticipated burn?</td></tr>
<tr><td></td></tr>
</table>

If burning is to occur within a non-urban area, list neighbors within a one-mile radius of the burn area. Use additional sheets if necessary.			
Name:		Name:	
Address:		Address:	
Telephone:		Telephone:	
Name:		Name:	
Address:		Address:	
Telephone:		Telephone:	

Indicate how you will coordinate with other concerned agencies, including the Responsible Authorities of sensitive features identified above *(such as the FAA, State Troopers, military, fire department, adjacent land managers, etc.)* Include a list of telephone numbers or email addresses of agencies you will contact prior to

Indicate how you will coordinate with DEC Air Quality. *At a minimum, the DEC Meteorologist must be notified one week prior to anticipated project ignition (907-269-7676). If your application is approved, a weather conference call should be scheduled for 24 - 96 hours prior to the actual burn.*

Attach a copy of your approval for the DNR - Forestry Division Open Burn Permit for your planned activity, or explain below why a DNR Burn Permit is not required.

8. METEOROLOGICAL / WEATHER FORECASTING

The Division's meteorologist is responsible for ensuring, from the Department's standpoint, that smoke from a land clearing / agricultural burn does not adversely impact the public. To allow their participation in the burn decision making process, please ensure that this application is completed and submitted at least 3 weeks prior to a scheduled burn so they can participate in pre-burn planning events several days prior to ignition.

Indicate how weather forecasts will be obtained and used to prevent smoke impacts. Identify how the local and spot weather forecast will be obtained prior to ignition of the open burn (for example, contacting the National

Weather Service). *Parameters that should be obtained are the predicted visibility, dispersion conditions, transport and local area wind direction, and wind speed.*

Indicate how weather changes will be monitored.

Explain what you will do if a wind shift or other weather change begins to create an adverse smoke impact on Sensitive Features previously identified.

Indicate what will be done to ensure smoke disperses as forecast. Note: If a test fire fails to indicate that acceptable smoke dispersion will occur, no more fires are to be ignited.

Indicate proposed techniques to be used to enhance the active fire phase and reduce the smoldering phase. Consider employing emission reduction techniques before, during and after the fire. Indicate what techniques are feasible for you to accomplish.

DEC may require monitoring for certain burns. Such burns are typically large-scale or very close to sensitive features. The monitoring requirements, if any, will be addressed within the approval process. If monitoring is required, DEC may supply monitoring equipment and personnel. The applicant acknowledges that time and materials will be charged for DEC services. _______Yes
If applicable, identify how the effect of the fire on air quality at Sensitive Features will be monitored.

If any safety hazard is present, or if requested by the persons in control of a sensitive area, you must mitigate the smoke impact of the fire as quickly as possible. You will be held legally responsible for any accidents or adverse health effects that occur because of your open burn.

Certification: (If signing as an Authorized Agent, please submit a copy of your authority to do so.)

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.

Landowner Signature Date Fire Manager Signature (if applicable)
Date

Printed Name of Landowner Printed Name of Fire Manager (if applicable)

As of September 26, 2015, the fee for review of and routine compliance services for a request for Open Burning Approval is $230. With each burn application please submit a $230 administrative fee payable to the State of Alaska, DEC. If the department determines that a smoke incursion is likely as per 18 AAC 50.400(g), any additional costs will be billed on an hourly basis in accordance with 18 AAC 50.400(h). The applicant will be notified that DEC will charge an hourly administrative fee and direct costs for approval processing and administration. DEC will prepare and send a monthly invoice itemizing fees and direct costs to the applicant.

Send each open burn application and check to:

ADEC Air Permits Program

Anchorage Compliance Office Supervisor

Open Burn Request

555 Cordova Street

Anchorage, AK 99501

Your approval may be issued within 30 days. If approved, notification and burn summary requirements will be outlined in your letter of approval.

A copy of the open burning guidelines may be obtained through our website: https://dec.alaska.gov/air/air-permit/open-burn-inf

This approval does not constitute a permit or approval from any agencies other than ADEC Division ofAir Quality; other agency permits or approvals may be necessary.

DNR Large Scale Burn Permit Application (Draft)

State of Alaska
Division of Forestry
Large Scale Burn Permit

Permit Number:

The permittee is authorized to burn ______________________________________(project type)

at : ____(legal, physical, street address)

________(Lat/Long);

subject to the following terms ____

and conditions (attach additional pages as needed):

Size, configuration, and materials

- □ ______pile(s) of organic materials only not to exceed______feet in diameter and feet in height.
- □ ______acre(s) of un-matted grass less than______inches in height.
- □

Containment/fuel breaks

- □ Construct a fuel break a minimum of______times the height of the pile by removing all vegetation and flammable material from around all sides of the pile and clearing down to mineral soil.
- □ Utilize man-made fuel breaks (e.g. roads, driveways, trails) as primary containment lines and burn into the wind.
- □ Utilize black/wet line (minimum______feet wide) to divide field into______acre sections or less and burn one section at a time.
- □

Ignition and smoke management

- ◻ Do not ignite before______a.m./p.m. ◻ Do not burn in winds greater than mph.
- ◻ Do not burn if smoke will impact neighboring properties or businesses.
- ◻

Resources

- ◻ A minimum of______persons with hand tools must be on scene while actively burning
- ◻ A minimum of______persons with hand tools must be on scene until the fire is fully extinguished and cold to the touch
- ◻ A minimum of______gallons of pressurized water and adequate hose to reach around all sides of the fire is required while burning.
- ◻ Heavy equipment (excavator/dozer) must be on scene while burning.
- ◻

Monitoring and patrolling

- ◻ Actively monitor and patrol perimeter and adjacent wildlands for spotting or escapement until the fire is fully extinguished and cold to the touch.
- ◻ Monitor winds and cease burning if windspeed exceeds______mph.
- ◻ Monitor smoke and cease burning if smoke impacts neighboring properties or if ash falls outside of fuel break or containment lines.
- ◻

Every day you burn and prior to burning you are required to:

□ Call the________________Area Forestry Burn Permit Advisory Line at (907) for a recorded message announcing whether or not burning is allowed for the day.

□ Call________________Area Forestry Dispatch at (907)________________ and notify them of your intent to burn.

□ Call____________________at (907)_________________________and notify them of your intent to burn.

Additional Permit Requirements or Conditions

□ This permit is issued by the Alaska Division of Forestry as authorized by AS 41.15.010 (Protection from wildland fire), 41.15.050 (Fire season) and 41.15.060 (Permits).

□ This burn permit may be denied, suspended or revoked by an authorized employee of the State of Alaska Division of Forestry. 11 AAC 95.430 (Denial, suspension, or revocation of permit).

□ The permittee shall have this permit signed, and in their possession while burning and shall display it upon request. 11 AAC 95.412 (Permit requirements).

□ Large scale burning may be subject to other Federal, State or local laws and regulations that are more restrictive. The permittee is responsible for determine and complying with any Federal, State or local laws and regulations that apply.

□ Open burning of woody debris material by farmers and developers requires written DEC approval prior to lighting if the intent is to burn, or clear and burn, 40 acres or more during a year
18 AAC 50.065 (g) (Open Burning)**.** It is the responsibility of the Permittee to contact the State of Alaska Department, Department of Environmental Conservation, Air Quality Division to determine if a permit is required.

Non-compliance with this permit may lead to a fine or criminal prosecution. This permit does not relieve the permittee from civil or criminal liability for damages resulting from an unpermitted burn or escaped fire.

Permit Classification: □ **Agricultural** □ **Contractor** □ **Miscellaneous**

Effective Start Date and Expiration Date of Permit :

Permittee signature:____________________________ Printed name

Date

Issuing Agent: _____________________________________Title

Date

Appendix D Emission Reduction Techniques

Emission Reduction Techniques

The DEC encourages land managers to use techniques that increase combustion efficiency andreduce the smoldering stage of burning, such as fans (when burning slash), mass ignition, accelerated mop-up, and other methods.

To maximize the effective use of fire within the emission levels allowed, it is necessary to employ improved burning techniques. The science of predicting the amount of emissions has improved within the last few years thanks to research done by the USFS Pacific Northwest Research Station, but more work needs to be done for Alaska-specific conditions.

Computer models allow land managers to analyze proposed burns and prepare burning prescriptions that will produce minimum emissions on each acre to be treated. Various site factors and burning technique scenarios can be tested in the models, and estimates of emissions that each scenario would produce can be calculated. This capability will allow land managers totreat maximum acreage with minimum emission production.

The following smoke management and emission reduction techniques are considered best management practices:

1. Reducing the biomass by use of techniques such as yarding or consolidation of merchandisable material, multi-product timber sales, or public firewood access,when economically feasible. When allowing public firewood access, the public must also be informed of the adverse impact of using green or wet wood as fuel;
2. Burning in seasons characterized by meteorological conditions that allow for good smoke dispersion;
3. Using mass ignition techniques such as aerial ignition by helicopter to produce high intensity fires with short duration impacts;
4. Igniting burns under good-to-excellent ventilation conditions and suspendingoperations under poor smoke dispersion conditions;
5. Considering smoke impacts on activities conducted by local communities and land users;
6. Burning only those fuels essential to meet resource management objectives;
7. Minimizing duff consumption and smoldering through fuel moisture considerations;
8. Burning piles when other burns are not feasible, such as when snow or rain is present;
9. Implementing maintenance burning in a periodic rotation mimicking natural fire cyclesto reduce excessive fuel accumulations and subsequent excessive smoke production through smoldering or wildfire; and
10. Managing smoke impacts as follows:
    a. Limiting smoke impacts to roads, highways, and airports

to the amounts, frequencies, and durations consistent with any guidance provided by highwayand airport personnel;

b. Using appropriate signing if smoke will impact any point of public access, i.e. highways, dirt roads, trails, campgrounds, etc.;
c. Notifying potential impacted sensitive receptors; and
d. Determining nighttime impacts and taking appropriate precautions.

Appendix E

Smoke Management Contingency Plan

Smoke Management Contingency Plan

Each Burn Plan submitted to DEC for written approval should contain a contingency plan for actions to be taken if smoke impacts sensitive features in the area. The format is entirely up to the Responsible Authority, but appropriate short-term (less than 24-hour) contingency actions should, among other things, include:

1. identification and location of smoke sensitive features;
2. smoke sensitive features distance from burn area, potential for problems;
3. notifying the affected public of elevated pollutant concentrations;
4. list of emergency contact numbers in case of smoke intrusions;
5. suggesting actions to be taken by sensitive persons to minimize their exposure (e.g.,remain indoors, avoid vigorous activity);
6. providing clean-air facilities for sensitive persons or means of evacuation if needed;
7. halting ignitions of any new open burning that could impact the same area;
8. identification of fuel loading, consumption, and potential rates of emission production over time (so that you can anticipate when the highest emission production will occur).

Example text follows (for guidance purposes, these are not necessarily required items):

> "Smoke sensitive areas are primarily the communities of Tok, Chicken, and Northway. Potential smoke related problems include effects on individuals with respiratory problems and reduced visibility for aircraft at airstrips. The potential for smoke related problems are considered minimal due to the distances between these communities and the burn (from 25 to 50 miles away)."
>
> The following measures will be taken to reduce the potential for smoke related problems:
>
> 1. firing will not be conducted when fog or inversion potential exists; and
> 2. notification will be given to DEC, Alaska State Troopers in Tok, the FAA FlightServices in Northway, the Boundary and Alaskan Ports of Entry, and media contacts.

Table of Fuel loading and consumption information

Size class (inches dia)	surface fuel tons/acre	% consumption	duff fuel tons/acre	consumption tons/acre
0-0.25	0.2	40.0		0.08
0.25-1.0	0.3	12.5		0.04
1.00-3.0	0.5	7.5		0.04
>3	3.0	2.5		0.07
duff loading	(estimate)	30.0	10	3.0
TOTAL				3.23

Appendix F

Alternatives to Burning

Alternatives to Burning

The term "alternatives" refers to mechanical, biological, or chemical treatment methods of fuel reduction that do not include burning, such as chipping, grinding, logging, and mechanical/hand thinning with removal. The need for using prescribed fire falls into three broad categories: reduction of hazardous fuels, ecological effects, and ecological restoration. In order to be considered a "non-burning alternative" the treatment must mimic at least some effect of a prescribed fire.

Land managers should consider the availability and feasibility of alternatives to burning in lieu of burning. This is particularly true where there is likelihood that burning in or near residential areas may cause an exceedance of the NAAQS, and/or when alternatives are available, feasible, economical, and when the use of the alternative will not cause other unacceptable environmental or human health effects. When alternatives to burning are used, land managers should report this to DEC so that the effort can be tracked as an emission reduction technique.

Examples of alternative measures include:

1. **Mechanical removal.** This category includes logging, onsite chipping, offsite use of brush or firewood, or treatment of unmerchantable material such that slash burning is not needed.

2. **Chemical treatments**.

3. **Land use change.** According to the NWFCG Smoke Management Guide, changing wildland to another land use category may result in elimination of the need to burn in a prescriptive manner. Conversion of a wildland site to an urbanized use is the example that they gave (view website at: http://www.nwcg.gov/pms/pubs/large.html#SmokeManagement)

4. **Reduction of fuel consumed in a prescribed burn.** This is achieved when fuels are at or above the moisture of extinction and therefore are unavailable for combustion. This may not result in a real reduction in emissions, and it may significantly increase smoldering. But if it is the intention of the land manager to leave the unburned fuels for biological decomposition (or for other reasons), then this method does qualify as an "alternative.".

Appendix G

Air Quality Monitors

Air Quality Monitors

There are several types of air monitors that can be used to assess ambient levels of particulate matter. Ambient monitoring determines when the public is being impacted by smoke and is a tool to help the burn agency and DEC take necessary steps to protect the public.

FRM or "Federal Reference Method" is a monitor that has been set up and operated in accordance with the procedures set out in the Code of Federal Regulations (CFR). Site placement is very important in determining whether it is a FRM monitor or not. These monitors are usually manually operated samplers with "paper" filters and a vacuum air flow which requires electrical power. While these monitors do provide official data, it often takes several days to process the filter. This type of monitor setup also includes various types, Hi-Vol (PM_{10}), and R&P $PM_{2.5}$ Partisol.

FEM or "Federal Equivalent Method" monitors are comprised of monitors and procedures which were approved after the FRM procedure was promulgated. Some of these monitors are filter-based, manual samplers and some are continuous samplers, like the "real-time" monitors. The real-time monitors are more costly than the filter-based systems, but they do have continuous read-outs which give concentrations in "real time." Many of these monitors are portable; some are hand-held and operate on battery packs, so they do not require electrical sources. This type of monitor includes beta gauges, TEOMS, etc.

SLAMS or "State and Local Air Monitoring Site" A fixed monitoring site which is part of the federal monitoring network, these are normally used to determine compliance with the national particulate standard. An example would be one of the monitors in Anchorage.

SPM or "Special Purpose Monitors" may or may not be FRMs. By virtue of their being SPMs, the data could be used to assist, track, and evaluate a burn without "counting against" the land manager. Land managers should be encouraged to use SPMs to collect data. SPMs are usually used to assess pollutant levels and to determine whether a more long-term monitor is needed. They are usually set-up temporarily. Most monitors have been tested against a FRM unit. The assumption is that the data provide a good approximation of what the ambient particulate levels are. An example of each type of sampler would be the Anderson Hi-Vol manual PM_{10} sampler (FRM) and R&P $PM_{2.5}$ Partisol (FRM), the Graseby Beta Gauge and R&P TEOMS (two FEM continuous $PM_{10/2.5}$ monitors), and the nephelometer (a continuous, special purpose, fine-particulate monitor).

IMPROVE or "Interagency Monitoring of Protected Visual Environments." Refers to the monitoring network used to assess air quality in Class I and Class II areas. These units monitor particulates, total carbon, and other components. IMPROVE consists of air quality data from Class I areas that include national parks and wilderness areas where visibility is deemed an important attribute. This monitoring program is an interagency effort with the U.S. Environmental Protection Agency (EPA) and the U.S. Department of the Interior (DOI), including the U.S.Forest Service (USFS), U.S. Fish and Wildlife Service (FWS), and the Bureau of Land Management (BLM). The National Park Service (NPS) provides monitoring and maintains the database to determine spatial and temporal trends in visibility in the NPS parks and wilderness areas and determine causes for visibility degradation. The IMPROVE fine particle network collects $PM_{2.5}$ and PM_{10} samples over a twenty four hour period every Monday and Friday using IMPROVE samplers. The network consists of over 110 monitoring sites, located in Class I ("Clean Air") areas, and has been in operation since 3/88. The PM samples are analyzed for $PM_{2.5}$ mass and its elemental constituents, organics, ions, light absorption, and PM_{10} mass. The data set contains the concentrations, minimum detection limit, error, and data quality flags.

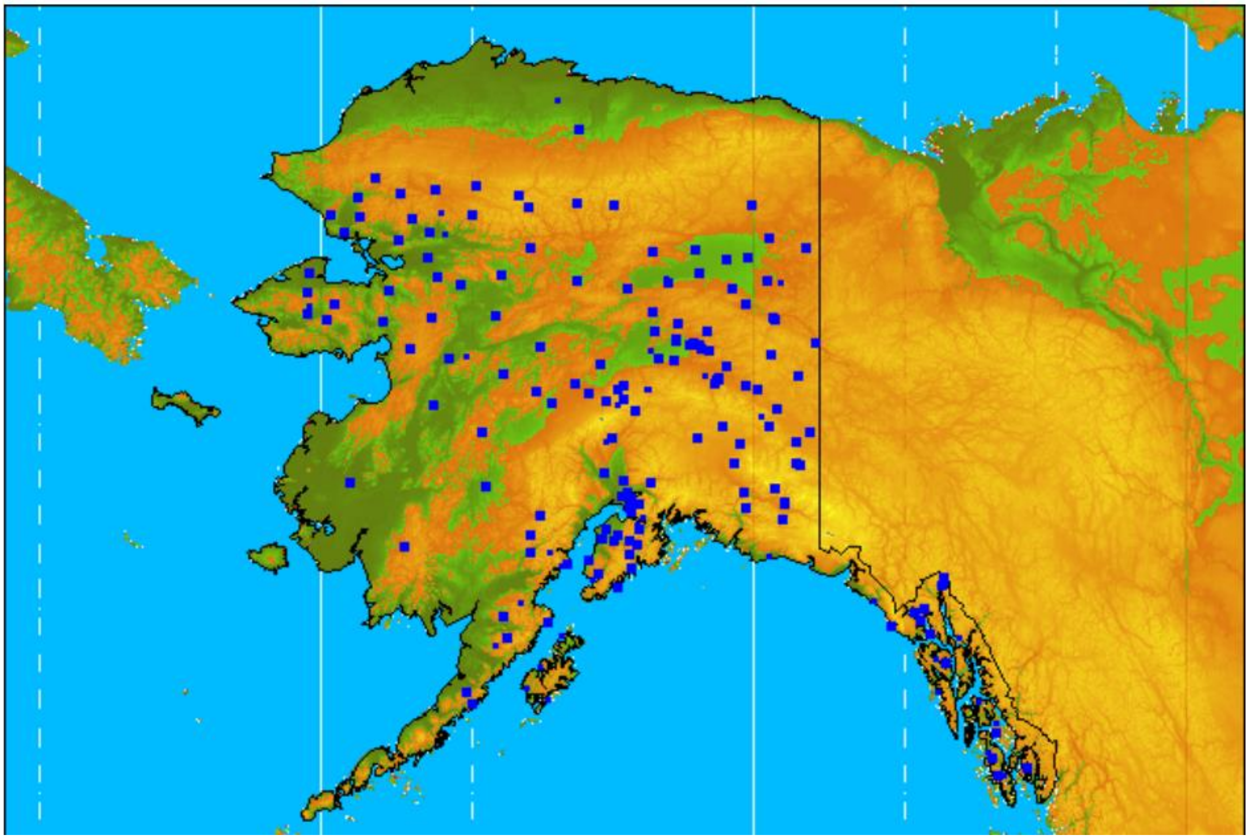
Visual: refers to the evaluation of smoke concentration based on visibility. Experienced personnel would be stationed along roadways, in communities, etc. to evaluate visibility impacts due to smoke. For example, visibility of ¾ mile or less can be indicative of very unhealthy air quality due to hazardous $PM_{2.5}$ concentrations, whereas visibility of 3 to 5 miles indicates concentrations that can be unhealthy for sensitive individuals. This procedure, when done properly, could give somewhat valid information on smoke concentrations in an airshed. A good "rule of thumb" tabulation on this method is located in the Smoke Management Guide for Prescribed and Wildland Fire, 2001 edition, p.31. (www.nwcg.gov)

Smoke impacts at various receptors: a certain number of valid complaints from community residents may be evaluated and considered for taking mitigation action on a prescribed burn. Valid complaints from local safety, government, fire department or other authority will be given priority consideration.

Appendix H

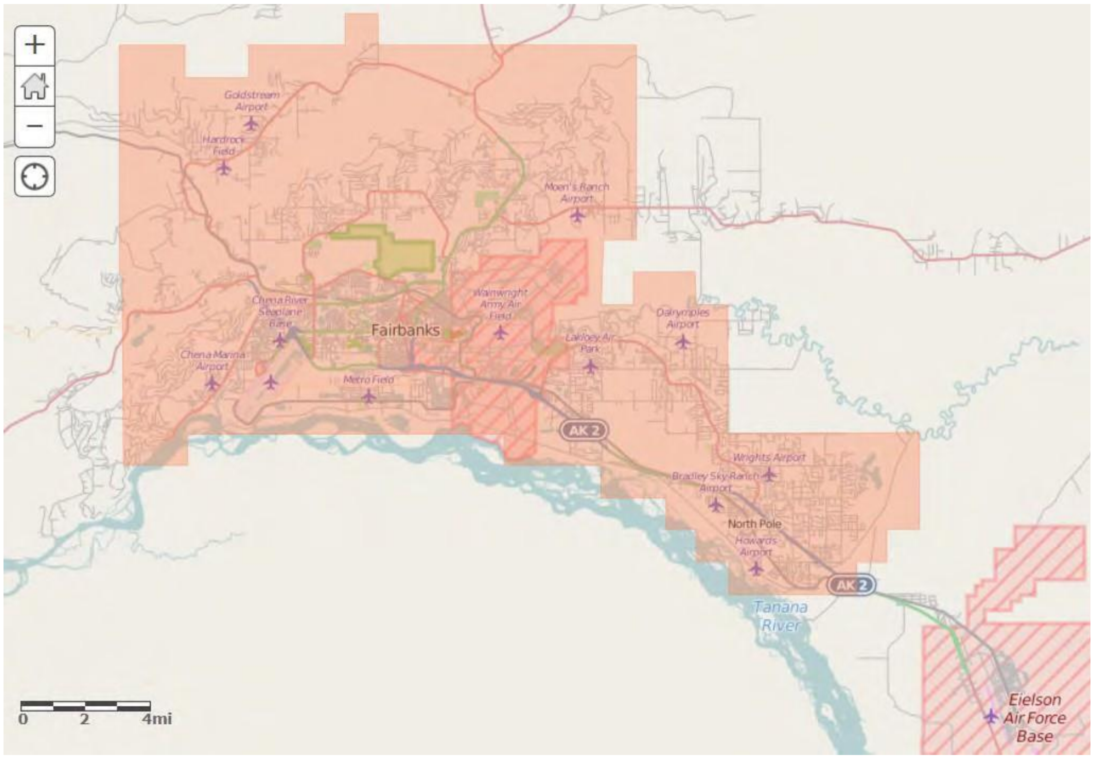
Maps

Fire Weather Monitoring Stations



Archived Remote Automated Weather Station
(RAWS) data available at
http://www.wrcc.dri.edu/wraws/

Fairbanks $PM_{2.5}$ Nonattainment Area

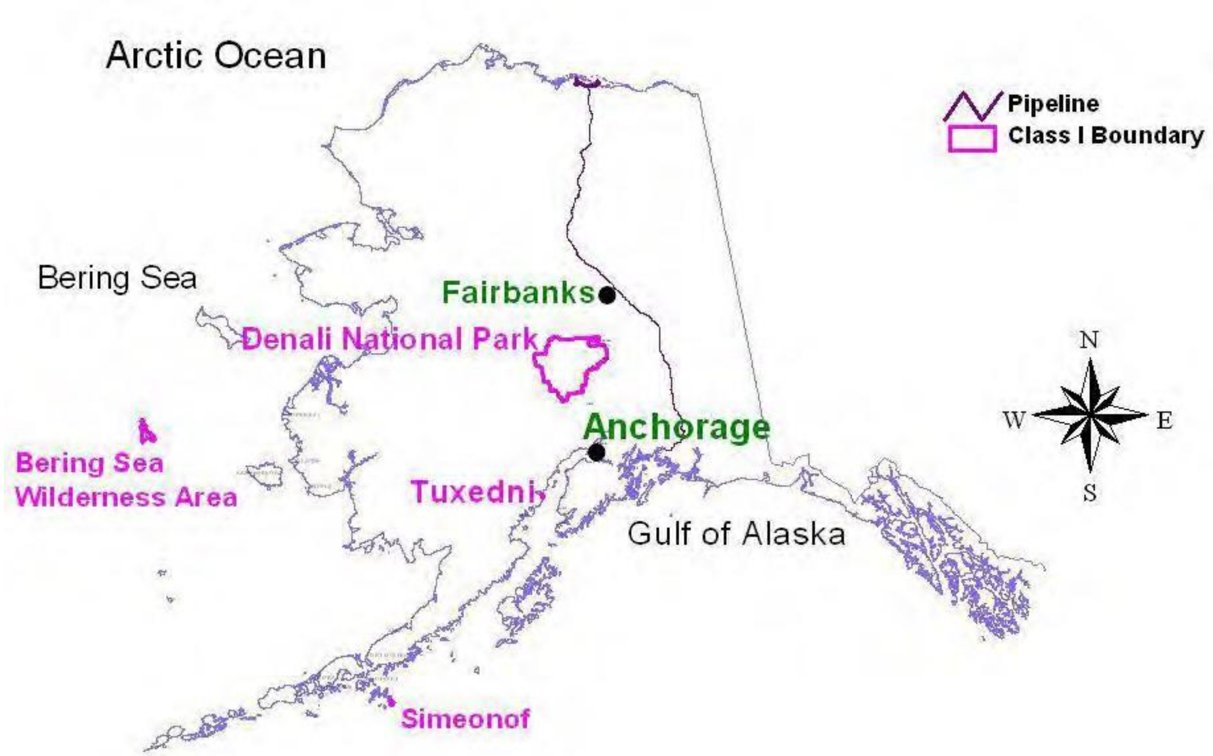


An online GIS version of this map is accessible from DEC's web map gallery: http://dec.alaska.gov/das/GIS/apps.htm.

Alaska Visibility Protection Area (VPA)

A full description of the Alaska Visibility Protection Area (VPA) can be found in the Alaska Regional Haze Plan, Chapter K.13.H (Long Term Strategy) in sub-chapter 2.A. Regional Haze Visibility Protection Area.

Alaska's Class I Areas



Appendix I

Example Air Quality Advisory

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Air Quality AIR QUALITY ADVISORY
South Central Alaska #2014-F3
Thursday May 22, 2014 2014

LOCATION(S) IMPACTED: South Central Alaska. Fires near Tyonek and Soldotna are impacting air quality over a large portion of south-central Alaska to include the Mat-Su Valley,Anchorage, the western Kenai Peninsula and Kodiak Island. The Mat-Su and Anchorage air quality offices have issued advisories for those areas. This advisory is for the Western Kenai Peninsula. All these advisories are available on the DEC website.
http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories

TIME/DATE OF UPDATE: Thursday May 22, 2014 2:00 PM.

VALID TIME: Thursday May 22, 2014 2:00 PM. to Tuesday May 27, 2014 4:00 PM

TIME/DATE OF THE NEXT REPORT: Friday May 23, 2014 4:00 PM

ADVISORY: Fires near Tyonek and Soldotna are impacting air quality on the Kenai Peninsula. Smoke from these fires has saturated the air over a large portion of South-central Alaska. Main population areas impacted are Kenai, Nikiski, Soldotna, Ninilchik, Kasilof, Seldovia, and Homer. Although a large area of smoke is over Kodiak Island, concentrations are more diffuse inthat area. Conditions are expected to continue through the weekend. Air Quality throughout the area will vary between **GOOD** and **VERY UNHEALTHY** depending on wind patterns and fire behavior.

Be aware that areas immediately downwind of any fire will experience **HAZARDOUS** levels ofsmoke. Generally, worse conditions occur overnight and during the early morning hours, as theatmosphere cools and brings smoke to the surface. During the day, surface heating will mix smoke and carry it upwards, temporarily improving air quality.

SMOKE AND PUBLIC IMPACT: This is an area forecast, and as such is a general forecast for portions of South Central Alaska. Smoke intensity will vary depending on precise location and localwind flow patterns. Smoke concentrations will be such that they could impact public health at times. It is advised that travelers check local weather as smoke conditions may vary considerably from one locality to the next. The most recent weather observations may be found on National Weather Service's homepage at **http://pafc.arh.noaa.gov/obs.php.**

In smoke impacted areas, DEC advises people with respiratory or heart disease, the elderlyand children should avoid prolonged exertion; everyone else should

limit prolonged exertion. See the table below for more guidance on the Air Quality Index categories and Cautionary Statements.

The following table contains the cautionary statements for the Air Quality for Particle Pollution.

Air Quality Category	**Cautionary Statements**
Good	None
Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion.
Unhealthy for Sensitive Groups	People with heart or lung disease, the elderly and children should reduce prolonged or heavy exertion.
Unhealthy	People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion
Very Unhealthy	People with respiratory or heart disease, the elderly and children should avoid any outdoor activity; everyone else should avoid prolonged exertion
Hazardous	Everyone should avoid any outdoor exertion; people with respiratory or heart disease, the elderly and children should remain indoors

When air quality data is unavailable, the following **Air Quality Smoke Reference Guide** may beused to estimate air quality levels and potential health impacts:

Visibility	Air Quality
10+ miles	Good
6 - 9 miles	Moderate
3 - 5 miles	Unhealthy for sensitive groups
1.5 - 2.5 miles	Unhealthy
0.9 - 1.4 miles	Very Unhealthy
0.8 miles or less	Hazardous

FOR MORE INFORMATION: For information on this advisory, contact Mark Smith with the Division of Air Quality at 907-269-7676.

Criteria to issue an Air Quality Alert

18 AAC 50.245. Air quality episodes and advisories for air pollutants other than PM-2.5.

(a) The department or a local air quality control program may declare an air quality episode andprescribe and publicize curtailment action if the concentration of an air pollutant in the ambientair has reached, or is likely in the immediate future to reach, any of the concentrations established in Table 6 in this subsection.

Table 6.
Concentrations Triggering an Air Quality Episode for Air Pollutants Other Than PM-2.5

Episode Type	**Air Pollutant**	**Concentration in micrograms per cubic meter {and in ppm where applicable}**
Air Alert	Sulfur dioxide	365 (24-hour average) {0.14 ppm}
	* $PM_{2.5}$	40 (24-hr average)
	PM_{10}	150 (24-hour average)
	PM_{10} from wood burning (wood smoke control areas)	92 (24-hour average)
	Carbon monoxide	10,000 (8-hour average) {8.7 ppm}
Air Warning	Sulfur dioxide	800 (24-hour average) {0.31 ppm}
	* $PM_{2.5}$	150 (24-hr average)
	PM_{10}	350 (24-hour average)
	Carbon monoxide	17,000 (8-hour average) {15 ppm}
Air Emergency	Sulfur dioxide	1,600 (24-hour average) {0.61 ppm}
	* $PM_{2.5}$	250 (24-hr average)
	PM_{10}	420 (24-hour average)
	PM_{10} from wood burning (wood smoke control areas)	During an air alert, a concentration measured or predicted to exceed 92 (24-hour average), and to continue to increase beyond the concentration that triggered the air alert
	Carbon monoxide	34,000 (8-hour average) {30 ppm}

(b) The department or a local air quality control program will declare an air quality advisory if, in its judgment, air quality or atmospheric dispersion conditions exist that might threaten publichealth.

(c) If the department or a local air quality control program declares an air quality advisory under (b) of this section, the department or a local air quality control program will

(1) request voluntary emission curtailments from any person issued a permit under this chapter whose stationary source's emissions might impact the area subject to the advisory;and

(2) publicize actions to be taken to protect public health.

(d) Nothing in this section alters a local government's powers or obligations under a local air quality control program established under AS 46.14.400 and other local laws, as applicable. (Eff.1/18/97, Register 141; am 10/1/2004, Register 171; am 2/28/2015, Register 213)

18 AAC 50.246. Air quality episodes and advisories for PM-2.5. (a) The department or a localair quality control program may declare an air quality episode and prescribe and publicize the actions to be taken if the concentrations of PM-2.5 in the ambient air has reached, or is likely in the immediate future to reach, any of the concentrations established in Table 6a in this subsection. The episode thresholds and actions prescribed for any area that has a local air qualityplan included in the *State Air Quality Control Plan* adopted by reference in 18 AAC 50.030 mustbe consistent with the emergency episode provisions included in that plan.

Table 6a
Concentrations Triggering an Air Quality Episode for PM-2.5

Episode Type	**Air Pollutant**	**Concentration in micrograms per cubicmeter**
Air Alert	$PM_{2.5}$	35.5 (24-hour average)
Air Warning	$PM_{2.5}$	55.5 (24-hour average)
Air Emergency	$PM_{2.5}$	150.5 (24-hour average)

(b) The department or a local air quality control program authorized by the department under AS 46.14.400 will declare a PM-2.5 air quality advisory if, in its judgment, PM-2.5 air quality oratmospheric dispersion conditions exist that might threaten public health.

(c) If the department or a local air quality control program declares a PM-2.5 air quality advisoryunder (b) of this section, the department or a local air quality control program will

(2) request voluntary emission curtailments from any person issued a permit under thischapter whose stationary source's emissions might impact the area subject to the advisory; and

(2) publicize actions to be taken to protect public health.

(d) Nothing in this section alters a local government's powers or obligations under a local air quality control program established under AS 46.14.400 and other local laws, as applicable. (Eff.2/28/2015, Register 213)