INL/EXT-19-52683
Revision 0

Idaho National Laboratory Annual Report for Permit to Construct P-2015.0023 for Calendar Year 2018

March 2019

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operated by Battelle Energy Alliance

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March 2019

Idaho National Laboratory
Idaho Falls, Idaho 83415

http://www.inl.gov

Prepared for the
U.S. Department of Energy
Office of Nuclear Energy
Under DOE Idaho Operations Office
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ABSTRACT

The U.S. Department of Energy (DOE) Idaho National Laboratory (INL) Site operates facilities with potential emissions of criteria and hazardous air pollutants.

This report documents the calendar year 2018 criteria and hazardous air pollutants emissions and has been prepared to comply with permit to construct (PTC) P-2015-0023, Condition 2.9 and Idaho Administrative Procedures Act (IDAPA) 58.01.01.178, Standard Contents of Permits Establishing a Facility Emissions Cap. IDAPA 58.01.01.178.04 requires that all permits establishing a FEC shall include sufficient reporting to assure compliance with the permit establishing the FEC.

Total hazardous air pollutant (HAP) emissions for the year were 1.49 tons in aggregate and the maximum individual HAP was hydrochloric acid at 1.26 tons. Criteria pollutant emissions were 2.16 tons for sulfur dioxide, 35.65 tons for oxides of nitrogen, 11.58 tons of carbon monoxide, 3.51 tons of total particulate matter and 2.66 tons of VOCs. No permitted limits were exceeded.

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ACRONYMS

AMWTP	Advanced Mixed Waste Treatment Project
BEA	Battelle Energy Alliance
CFA	Central Facilities Area
CO	carbon monoxide
DOE	Department of Energy
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
INL	Idaho National Laboratory
HAP	hazardous air pollutant
MFC	Materials and Fuels Complex
NO_2	nitrogen dioxide
NRF	Naval Reactors Facility
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	permit to construct
RWMC	Radioactive Waste Management Complex
SMC	Specific Manufacturing Capability
SO_2	sulfur dioxide
TAN	Test Area North
T/yr	tons per consecutive 12 calendar month period
VOC	volatile organic compounds

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1. INTRODUCTION

The U.S. Department of Energy (DOE) Idaho National Laboratory (INL) Site operates facilities with potential emissions criteria pollutants and hazardous air pollutants (HAPs). This report has been prepared to comply with permit to construct (PTC) P-2015.0023, Condition 2.9 and Idaho Administrative Procedures Act (IDAPA) 58.01.01.178.04, Recordkeeping.

This report documents the criteria pollutants and hazardous air pollutant emissions from the INL emission sources regulated by PTC P-2015.0023. In addition to annual emissions the report includes record summaries of the data used for determining the 12-month total facility-wide criteria pollutant and HAP emissions, the 12-month rolling emissions totals generated under the criteria pollutant emissions calculation and HAP emissions calculation for the reporting period. A table of emissions units with changes that occurred during the calendar year is also included.

2. INL OVERVIEW

INL is a science-based, applied engineering national laboratory dedicated to supporting DOE's missions in nuclear and energy research, science, and national defense. Battelle Energy Alliance, LLC, (BEA) is the maintenance and operations contractor and operates INL under contract with DOE. BEA conducts research, development, demonstration, and deployment activities. INL also manufactures armor at the Specific Manufacturing Capability (SMC) facility for Abrams tanks under a government-to-government contract with the Department of Defense. In addition to the primary mission of INL, environmental cleanup and remediation is also performed at INL by Fluor Idaho, LLC. The Naval Reactors Facility (NRF), operated for the U.S. Naval Nuclear Propulsion Program by the Fluor Marine Propulsion, LLC, prepares and packages spent naval nuclear fuel for dry storage and eventual transport to a permanent repository.

There are currently 7 major facility areas at the INL Site (Figure 1) that are potential sources of pollutant emissions that are included in this report. They are:

- Radioactive Waste Management Complex (RWMC) and the neighboring Advanced Mixed Waste Treatment Project (AMWTP),
- Advanced Test Reactor Complex,
- Central Facilities Area (CFA),
- Idaho Nuclear Technology and Engineering Center,
- Materials and Fuels Complex (MFC),
- NRF, and
- Test Area North (TAN) that includes the SMC facility.

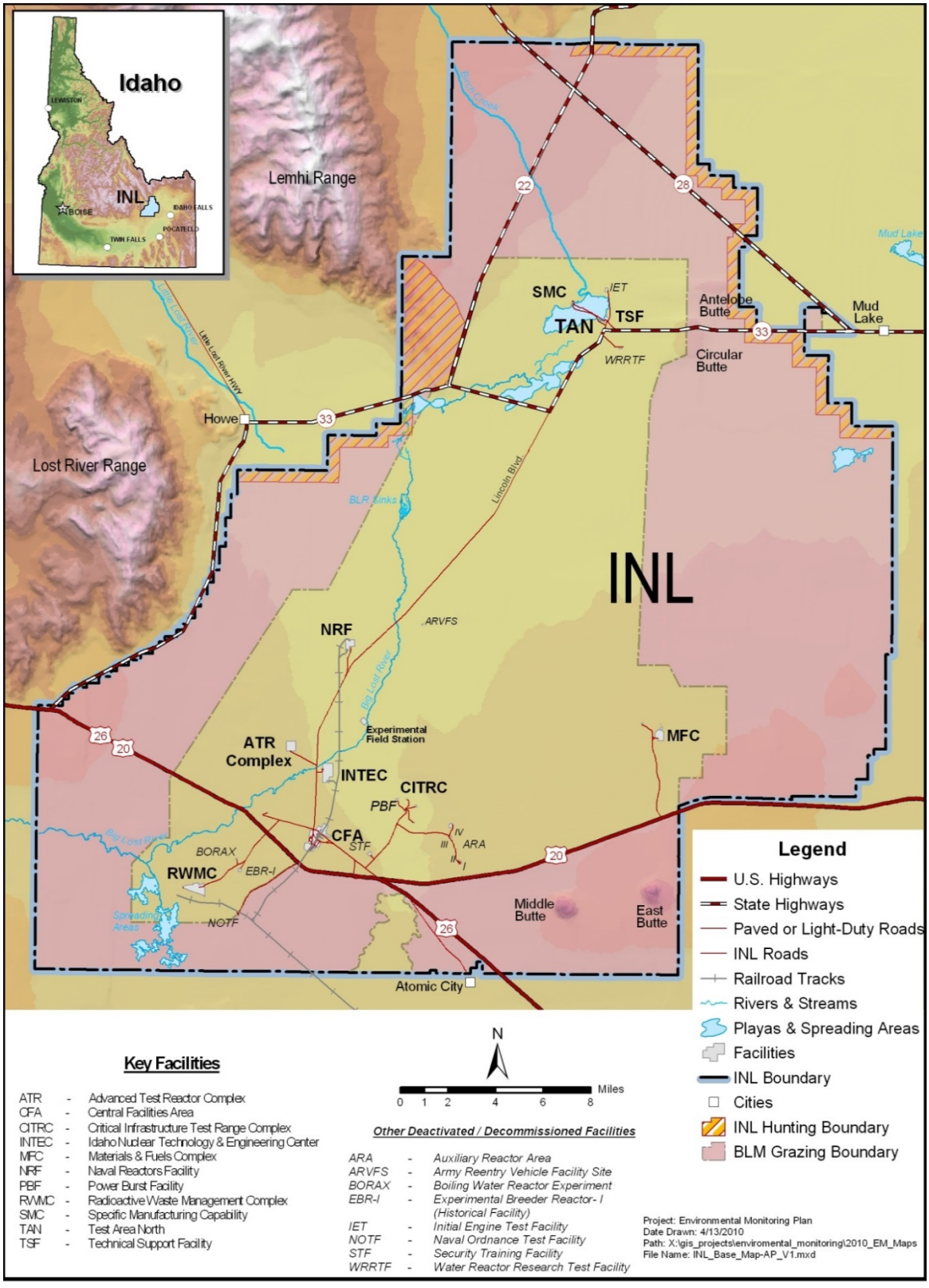

Figure 1 - Idaho National Laboratory Site Facilities

3. 2018 Criteria and Hazardous Air Pollutant Emissions

Facility-wide emissions from the US Department of Energy–INL facility are listed in the Table 1.

Table 1 - CY-2018 Criteria and Hazardous Air Pollution Emissions

$PM_{10}/PM_{2.5}$	SO_2	NOx	CO	VOC	Individual HAP		Aggregate HAP
T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	HAP	T/yr
3.51	2.16	35.65	11.58	2.66	1.26	Hydrochloric Acid	1.49

4. Monthly and 12 Month Rolling Emissions Totals

Appendix A contains the monthly and 12-month rolling emissions totals generated under the criteria pollutant emissions calculation and HAP emissions calculation for the reporting period.

5. Data Records

Records of data used for determining emissions are contained in Appendix B and are summaries of records maintained at the individual facilities.

6. Methods, Equations and Emission Factors

No new emission methods, equations, emissions factors, or sources for emissions factors were used to determine the 12-month total facility-wide criteria pollutant and HAP emissions for the calendar year.

7. Emission Unit Changes

The following emission unit changes occurred in calendar year 2018.

Nine new emergency internal combustion engines (ICE) were installed at INL after the application for PTC P-2015.0023 was submitted and two ICE were removed from service and replaced by engines meeting the requirements of 40 CFR Part 60 Subpart IIII, for compression ignition engines. Five engines that were inadvertently omitted from the permit application. See Table 2 below. All changes have been documented in the list of stationary sources that is required to be maintained by Permit Condition 2.4.

Table 2 - ICE Source Changes

Facility	Engine ID	Action	Installation Date	Removal Date	Purpose
CFA	B8-601	Installed	2016	NA	Replacement for B8-601 included in permit application.
CFA	B27-601	Installed	2016	NA	Emergency engine for new project.
CFA	ARA-632	Installed	2016	NA	Emergency engine for new project.
CFA	CFA-609-002	Installed	2016	NA	Emergency engine for new project.
CFA	TAN-601	Installed	2017	NA	Replacement for TAN-601 included in permit application.
CFA	B27-607/609	Installed	2018	NA	Emergency engine for new project.
RWMC	S-GEN-RE901	Installed	2017	NA	Emergency engine for new project.
MFC	ANL-1740	Installed	2015	NA	Emergency engine for new project.
MFC	ANL-1729	Installed	2017	NA	Emergency engine for new project.
AMWTP	BGEN-RCE-001	NA	2014	NA	Omitted from initial permit application.
RWMC	HV-GEN-RE301	NA	2007	NA	Omitted from initial permit application.
RWMC	S-GEN-RE401	NA	2008	NA	Omitted from initial permit application.

Table 2 (cont.)

Facility	Engine ID	Action	Installation Date	Removal Date	Purpose
RWMC	S-GEN-RE701	NA	2011	NA	Omitted from initial permit application.
RWMC	S-GEN-RE801	NA	2010	NA	Omitted from initial permit application.
CFA	B8-601	Removed	NA	2016	Replaced by new B8-601
CFA	TAN-601	Removed	NA	2017	Replaced by new TAN-601

NRF removed two boilers from service and installed a new replacement boiler that meets the 40 CFR Part 60 Subpart Dc (Table 3).

Table 3 - Boiler Source Changes

Facility	Engine ID	Action	Installation Date	Removal Date	Purpose
NRF	NRF-620-014 (Boiler No. 1)	Removed	1961	2018	End of useful life.
NRF	NRF-620-012 (Boiler No. 3)	Removed	1961	2018	End of useful life.
NRF	Boiler No. 5	Installed	2017	NA	Replacement boiler for emission units NRF-620-012 and NRF-620-014.

Appendix C contains lists of stationary sources with changes annotated. These changes took place after the initial permit application and are maintained to comply with Permit Condition 2.4.

Appendix A

Emissions

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Table A-1; 2018 Monthly Emissions

Hazardous Air Pollutants (Tons)	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
1,1,1-Trichloroethane	4.78E-04	4.76E-04	4.75E-04	4.68E-04	4.62E-04	4.60E-04	4.61E-04	4.60E-04	4.59E-04	4.69E-04	4.76E-04	4.81E-04
1,1,2,2-Tetrachloroethane	1.46E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.45E-05	1.44E-05	1.44E-05
1,1,2-Trichloroethane	2.01E-05	2.00E-05	2.00E-05	2.01E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05	2.00E-05
1,1-Dichloroethane	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05	2.44E-05
1,1-Dichloroethylene	1.84E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05	1.67E-05
1,2,4-Trichlorobenzene	NA[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05	4.86E-05
1,2-Dichloropropane	2.38E-05	2.37E-05	2.37E-05	2.38E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05
1,2-Diphenylhydrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Butadiene	2.10E-05	1.99E-05	1.81E-05	1.85E-05	3.07E-05	2.08E-05	1.76E-05	2.29E-05	1.84E-05	1.83E-05	1.72E-05	1.64E-05
1,3-Dichloropropene	8.80E-08	3.51E-08	2.92E-08	5.74E-08	3.46E-08	2.52E-08	2.57E-08	2.57E-08	4.09E-08	3.64E-08	1.16E-08	2.91E-09
1,4-Dichlorobenzene	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05	2.65E-05
1,4 Dioxane	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06	2.09E-06
2,2,4-Trimethyl pentane	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05	6.93E-05
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetaldehyde	4.20E-04	3.64E-04	3.34E-04	3.19E-04	5.79E-04	3.89E-04	3.26E-04	4.31E-04	3.29E-04	3.32E-04	3.29E-04	3.42E-04
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	2.38E-04	2.07E-04	2.02E-04	2.06E-04	2.34E-04	2.08E-04	2.01E-04	2.14E-04	2.04E-04	2.04E-04	1.99E-04	2.03E-04
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09	1.57E-09
Arsenic	1.06E-04	1.02E-04	1.00E-04	8.43E-05	7.05E-05	6.60E-05	6.62E-05	6.50E-05	6.30E-05	8.64E-05	1.02E-04	1.13E-04
Benzene	2.90E-03	5.90E-04	5.25E-04	5.41E-04	9.32E-04	5.75E-04	4.99E-04	6.77E-04	5.13E-04	5.30E-04	5.39E-04	1.19E-03
Benzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1.05E-04	1.01E-04	1.00E-04	8.84E-05	7.81E-05	7.47E-05	7.49E-05	7.40E-05	7.25E-05	9.00E-05	1.02E-04	1.10E-04
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08	1.41E-08
Bromoform	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08	5.70E-08
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4.38E-04	4.34E-04	4.33E-04	4.21E-04	4.11E-04	4.08E-04	4.08E-04	4.07E-04	4.05E-04	4.23E-04	4.35E-04	4.43E-04
Carbon disulfide	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05	3.80E-05
Carbon Tetrachloride	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03	1.46E-03

Table A-1 (cont.)

Hazardous Air Pollutants (Tons)	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Carbonyl sulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	6.98E-05	6.97E-05	6.97E-05	6.98E-05	6.97E-05	6.97E-05	6.97E-05	6.97E-05	6.97E-05	6.97E-05	6.97E-05	6.97E-05
Chloroethane (ethyl chloride)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04	1.33E-04
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	5.19E-05	4.87E-05	4.77E-05	3.57E-05	2.54E-05	2.20E-05	2.22E-05	2.13E-05	1.98E-05	3.73E-05	4.92E-05	5.73E-05
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cresols (m, p & o)	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05	6.17E-05
Cyanide	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04	1.06E-04
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	4.94E-05	4.87E-05	4.86E-05	4.68E-05	4.51E-05	4.46E-05	4.46E-05	4.45E-05	4.43E-05	4.70E-05	4.88E-05	6.45E-04
Ethylene Dibromide	1.48E-07	5.89E-08	4.89E-08	9.62E-08	5.80E-08	4.23E-08	4.31E-08	4.31E-08	6.86E-08	6.11E-08	1.94E-08	4.88E-09
Formaldehyde	5.06E-03	4.40E-03	4.23E-03	2.84E-03	2.00E-03	1.29E-03	1.22E-03	1.28E-03	9.60E-04	3.02E-03	4.38E-03	5.38E-03
Hexachlorobenzene	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07	1.84E-07
Hexachlorobutadiene	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07	7.00E-07
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05	2.79E-05
Hexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrochloric Acid	1.04E-01	1.67E-01	1.18E-01	1.45E-01	1.26E-01	1.64E-01	1.66E-01	6.70E-02	3.50E-02	5.40E-02	5.40E-02	5.85E-02
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1.81E-03	1.80E-03	1.80E-03	1.76E-03	1.73E-03	1.72E-03	1.72E-03	1.72E-03	1.72E-03	1.77E-03	1.80E-03	1.83E-03
Manganese	7.11E-05	6.46E-05	6.26E-05	3.87E-05	1.80E-05	1.12E-05	1.16E-05	9.78E-06	6.78E-06	4.19E-05	6.57E-05	8.19E-05
Mercury	7.54E-05	2.01E-04	7.12E-05	5.92E-05	4.88E-05	4.54E-05	4.56E-05	4.47E-05	4.32E-05	6.08E-05	7.27E-05	8.08E-05
Methanol	1.89E-04	1.76E-04	1.75E-04	1.81E-04	1.76E-04	1.74E-04	1.74E-04	1.74E-04	1.77E-04	1.76E-04	1.70E-04	2.02E-04
Methyl isobutyl ketone	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.38E-06	4.22E-05
Methylene chloride	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04	2.26E-04
Naphthalene	5.13E-04	1.14E-04	1.04E-04	7.58E-05	8.95E-05	3.78E-05	3.15E-05	4.93E-05	2.72E-05	7.68E-05	1.10E-04	2.78E-04
Nickel	3.68E-04	3.64E-04	3.63E-04	3.51E-04	3.41E-04	3.38E-04	3.38E-04	3.37E-04	3.35E-04	3.53E-04	3.65E-04	3.73E-04
Nitrobenzene	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05	7.68E-05
N-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated biphenyls	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03	3.13E-03
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04	3.80E-04
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POM/PAH	1.02E-03	3.60E-04	3.38E-04	2.49E-04	2.45E-04	1.42E-04	1.30E-04	1.59E-04	1.14E-04	2.58E-04	3.54E-04	5.98E-04
Selenium	2.46E-04	2.30E-04	2.25E-04	1.65E-04	1.13E-04	9.63E-05	9.74E-05	9.29E-05	8.54E-05	1.73E-04	2.32E-04	2.73E-04
Styrene	8.25E-08	3.29E-08	2.73E-08	5.38E-08	3.24E-08	2.37E-08	2.41E-08	2.41E-08	3.83E-08	3.41E-08	1.08E-08	2.73E-09
Tetrachloroethylene	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05	5.88E-05
Toluene	5.37E-03	4.48E-03	4.44E-03	4.27E-03	4.28E-03	4.08E-03	4.05E-03	4.11E-03	4.02E-03	4.29E-03	4.47E-03	5.37E-03

Table A-1 (cont.)

Hazardous Air Pollutants (Tons)	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Trichloroethylene	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04	1.08E-04
Vinyl Chloride	3.31E-07	3.01E-07	2.97E-07	3.13E-07	3.01E-07	2.95E-07	2.96E-07	2.96E-07	3.04E-07	3.02E-07	2.88E-07	2.83E-07
Xylene	1.26E-03	6.86E-04	6.68E-04	6.68E-04	7.83E-04	6.81E-04	6.58E-04	7.09E-04	6.61E-04	6.68E-04	6.72E-04	2.80E-03
Total	1.30E-01	1.88E-01	1.38E-01	1.64E-01	1.44E-01	1.81E-01	1.83E-01	8.43E-02	5.14E-02	7.33E-02	7.51E-02	8.56E-02
Maximum Single HAP Emission	1.04E-01	1.67E-01	1.18E-01	1.45E-01	1.26E-01	1.64E-01	1.66E-01	6.70E-02	3.50E-02	5.40E-02	5.40E-02	5.85E-02
Maximum Single HAP Emitted	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid

Criteria Air Pollutants	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
SO2	5.70E-02	2.14E-01	1.99E-01	1.96E-01	2.74E-01	2.01E-01	1.76E-01	2.15E-01	1.76E-01	1.90E-01	5.07E-02	2.07E-01
NOx	2.62E+00	3.43E+00	3.07E+00	2.77E+00	3.84E+00	2.07E+00	2.06E+00	2.91E+00	1.66E+00	2.58E+00	2.34E+00	6.31E+00
CO	7.47E-01	1.15E+00	1.05E+00	9.95E-01	1.20E+00	7.68E-01	6.89E-01	8.65E-01	6.90E-01	9.22E-01	5.96E-01	1.91E+00
PM-10/2.5 & Condensable	3.28E-01	4.00E-01	3.76E-01	2.89E-01	3.02E-01	1.88E-01	1.64E-01	2.03E-01	1.46E-01	2.91E-01	3.02E-01	5.16E-01
VOCs, as VOCs	6.65E-02	2.48E-01	2.29E-01	2.34E-01	3.39E-01	2.37E-01	2.08E-01	2.61E-01	2.09E-01	2.22E-01	6.01E-02	3.43E-01

Note 1: NA indicates no emissions for Calendar Year 2018.

Table A-2; 12 Month Rolling Emissions

Hazardous Air Pollutant (Tons)	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
1,1,1-Trichloroethane	6.31E-01	6.02E-01	5.73E-01	5.10E-01	4.47E-01	3.84E-01	3.21E-01	2.58E-01	1.95E-01	1.32E-01	6.86E-02	5.63E-03
1,1,2,2-Tetrachloroethane	1.05E-03	1.03E-03	1.00E-03	9.13E-04	8.20E-04	7.28E-04	6.35E-04	5.43E-04	4.51E-04	3.59E-04	2.66E-04	1.74E-04
1,1,2-Trichloroethane	8.92E-04	8.67E-04	8.42E-04	7.75E-04	7.08E-04	6.42E-04	5.75E-04	5.08E-04	4.41E-04	3.74E-04	3.07E-04	2.40E-04
1,1-Dichloroethane	2.51E-05	4.94E-05	7.38E-05	9.82E-05	1.23E-04	1.47E-04	1.71E-04	1.96E-04	2.20E-04	2.44E-04	2.68E-04	2.93E-04
1,1-Dichloroethylene	3.86E-02	3.51E-02	3.16E-02	2.81E-02	2.46E-02	2.11E-02	1.77E-02	1.42E-02	1.07E-02	7.18E-03	3.69E-03	2.02E-04
1,2,4-Trichlorobenzene	NA[1]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	2.76E-02	2.52E-02	2.28E-02	2.04E-02	1.79E-02	1.54E-02	1.30E-02	1.05E-02	8.01E-03	5.53E-03	3.06E-03	5.83E-04
1,2-Dichloropropane	4.50E-04	4.35E-04	4.20E-04	4.05E-04	3.90E-04	3.75E-04	3.60E-04	3.45E-04	3.30E-04	3.15E-04	3.00E-04	2.85E-04
1,2-Diphenylhydrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Butadiene	1.37E-03	1.33E-03	1.28E-03	1.17E-03	1.07E-03	9.50E-04	8.31E-04	7.17E-04	5.99E-04	4.80E-04	3.62E-04	2.40E-04
1,3-Dichloropropene	6.52E-07	6.69E-07	6.72E-07	7.10E-07	7.19E-07	7.22E-07	7.08E-07	6.95E-07	6.48E-07	5.71E-07	5.27E-07	4.13E-07
1,4-Dichlorobenzene	3.10E-02	2.96E-02	2.82E-02	2.51E-02	2.20E-02	1.89E-02	1.58E-02	1.27E-02	9.61E-03	6.51E-03	3.42E-03	3.18E-04
1,4 Dioxane	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05	2.51E-05
2,2,4-Trimethyl pentane	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	1.03E-03	7.81E-04	5.33E-04	2.84E-04	2.84E-04
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	7.00E-03	6.73E-03	6.46E-03	5.83E-03	5.21E-03	4.58E-03	3.96E-03	3.33E-03	2.71E-03	2.08E-03	1.46E-03	8.32E-04
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetaldehyde	2.65E-02	2.57E-02	2.47E-02	2.25E-02	2.04E-02	1.82E-02	1.59E-02	1.36E-02	1.13E-02	9.06E-03	6.79E-03	4.50E-03
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	4.27E-03	4.25E-03	4.23E-03	4.06E-03	3.90E-03	3.71E-03	3.52E-03	3.33E-03	3.13E-03	2.93E-03	2.73E-03	2.52E-03
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	1.57E-09	3.14E-09	4.71E-09	6.28E-09	7.85E-09	9.42E-09	1.10E-08	1.26E-08	1.41E-08	1.57E-08	1.73E-08	1.88E-08
Arsenic	3.25E-04	4.02E-04	4.76E-04	5.38E-04	5.95E-04	6.56E-04	7.17E-04	7.77E-04	8.36E-04	9.00E-04	9.62E-04	1.02E-03
Benzene	1.55E-01	1.42E-01	1.29E-01	1.15E-01	1.03E-01	8.94E-02	7.62E-02	6.27E-02	4.93E-02	3.61E-02	2.29E-02	1.00E-02
Benzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	2.69E-04	3.52E-04	4.32E-04	5.04E-04	5.72E-04	6.43E-04	7.14E-04	7.84E-04	8.53E-04	9.27E-04	9.99E-04	1.07E-03
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	1.41E-08	2.81E-08	4.22E-08	5.62E-08	7.03E-08	8.43E-08	9.84E-08	1.12E-07	1.26E-07	1.41E-07	1.55E-07	1.69E-07
Bromoform	5.70E-08	1.14E-07	1.71E-07	2.28E-07	2.85E-07	3.42E-07	3.99E-07	4.56E-07	5.13E-07	5.70E-07	6.27E-07	6.84E-07
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4.27E-03	4.35E-03	4.43E-03	4.50E-03	4.57E-03	4.64E-03	4.71E-03	4.78E-03	4.85E-03	4.92E-03	4.99E-03	5.07E-03

Table A-2 (cont.)

Hazardous Air Pollutant (Tons)	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Carbon disulfide	3.80E-05	7.60E-05	1.14E-04	1.52E-04	1.90E-04	2.28E-04	2.66E-04	3.04E-04	3.42E-04	3.80E-04	4.18E-04	4.56E-04
Carbon Tetrachloride	1.85E-01	1.73E-01	1.61E-01	1.45E-01	1.29E-01	1.13E-01	9.74E-02	8.14E-02	6.55E-02	4.95E-02	3.35E-02	1.75E-02
Carbonyl sulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	3.08E-02	2.94E-02	2.81E-02	2.51E-02	2.20E-02	1.90E-02	1.60E-02	1.30E-02	9.93E-03	6.90E-03	3.87E-03	8.37E-04
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	1.90E+00	1.73E+00	1.56E+00	1.39E+00	1.21E+00	1.04E+00	8.68E-01	6.95E-01	5.21E-01	3.48E-01	1.75E-01	1.60E-03
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	2.16E-04	2.47E-04	2.74E-04	2.93E-04	3.09E-04	3.27E-04	3.45E-04	3.63E-04	3.79E-04	4.00E-04	4.19E-04	4.38E-04
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cresols (m, p & o)	6.17E-02	5.89E-02	5.62E-02	5.00E-02	4.38E-02	3.77E-02	3.15E-02	2.54E-02	1.92E-02	1.31E-02	6.90E-03	7.40E-04
Cyanide	6.15E-02	5.88E-02	5.61E-02	5.00E-02	4.39E-02	3.78E-02	3.17E-02	2.56E-02	1.95E-02	1.35E-02	7.37E-03	1.28E-03
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl Benzene	3.18E-02	3.04E-02	2.89E-02	2.57E-02	2.26E-02	1.94E-02	1.63E-02	1.30E-02	9.93E-03	6.84E-03	3.74E-03	1.16E-03
Ethylene Dibromide	1.09E-06	1.12E-06	1.13E-06	1.19E-06	1.21E-06	1.21E-06	1.19E-06	1.17E-06	1.09E-06	9.57E-07	8.84E-07	6.92E-07
Formaldehyde	2.66E-02	2.88E-02	3.05E-02	3.13E-02	3.19E-02	3.26E-02	3.30E-02	3.36E-02	3.38E-02	3.47E-02	3.54E-02	3.60E-02
Hexachlorobenzene	1.65E-03	1.57E-03	1.49E-03	1.33E-03	1.16E-03	9.97E-04	8.31E-04	6.66E-04	5.00E-04	3.34E-04	1.68E-04	2.21E-06
Hexachlorobutadiene	7.00E-07	1.40E-06	2.10E-06	2.80E-06	3.50E-06	4.20E-06	4.90E-06	5.60E-06	6.30E-06	7.00E-06	7.70E-06	8.40E-06
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	1.61E-02	1.53E-02	1.46E-02	1.30E-02	1.14E-02	9.82E-03	8.24E-03	6.66E-03	5.08E-03	3.50E-03	1.92E-03	3.35E-04
Hexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrochloric Acid	8.23E-01	9.24E-01	9.76E-01	1.06E+00	1.12E+00	1.21E+00	1.31E+00	1.32E+00	1.29E+00	1.27E+00	1.26E+00	1.26E+00
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	2.66E-03	4.38E-03	6.08E-03	7.76E-03	9.43E-03	1.11E-02	1.28E-02	1.45E-02	1.61E-02	1.78E-02	1.95E-02	2.12E-02
Manganese	4.00E-04	4.28E-04	4.50E-04	4.55E-04	4.53E-04	4.58E-04	4.61E-04	4.63E-04	4.63E-04	4.73E-04	4.77E-04	4.84E-04
Mercury	7.04E-04	8.47E-04	8.29E-04	8.32E-04	8.31E-04	8.34E-04	8.35E-04	8.37E-04	8.37E-04	8.42E-04	8.45E-04	8.48E-04
Methanol	3.14E-02	3.02E-02	2.89E-02	2.59E-02	2.30E-02	2.00E-02	1.70E-02	1.41E-02	1.11E-02	8.09E-03	5.11E-03	2.14E-03
Methyl isobutyl ketone	3.09E-02	2.95E-02	2.81E-02	2.50E-02	2.19E-02	1.87E-02	1.56E-02	1.25E-02	9.37E-03	6.27E-03	3.18E-03	9.04E-05
Methylene chloride	8.16E-02	7.47E-02	6.74E-02	6.02E-02	5.30E-02	4.58E-02	3.86E-02	3.14E-02	2.43E-02	1.71E-02	9.91E-03	2.72E-03
Naphthalene	1.32E-03	1.37E-03	1.41E-03	1.42E-03	1.45E-03	1.47E-03	1.46E-03	1.42E-03	1.38E-03	1.39E-03	1.40E-03	1.51E-03
Nickel	4.18E-03	4.20E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.21E-03	4.22E-03	4.22E-03	4.22E-03	4.22E-03	4.23E-03
Nitrobenzene	3.12E-02	2.98E-02	2.85E-02	2.54E-02	2.24E-02	1.93E-02	1.62E-02	1.32E-02	1.01E-02	7.04E-03	3.98E-03	9.21E-04
N-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated biphenyls	1.38E-02	1.62E-02	1.87E-02	2.08E-02	2.29E-02	2.50E-02	2.71E-02	2.92E-02	3.13E-02	3.34E-02	3.55E-02	3.76E-02
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	3.80E-04	7.59E-04	1.14E-03	1.52E-03	1.90E-03	2.28E-03	2.66E-03	3.04E-03	3.42E-03	3.80E-03	4.17E-03	4.55E-03
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table A-2 (cont.)

Hazardous Air Pollutant (Tons)	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
POM/PAH	2.88E-03	3.10E-03	3.27E-03	3.35E-03	3.48E-03	3.56E-03	3.62E-03	3.61E-03	3.61E-03	3.69E-03	3.78E-03	3.97E-03
Selenium	1.07E-03	1.21E-03	1.33E-03	1.41E-03	1.48E-03	1.56E-03	1.63E-03	1.71E-03	1.77E-03	1.87E-03	1.95E-03	2.03E-03
Styrene	6.11E-07	6.27E-07	6.30E-07	6.65E-07	6.74E-07	6.76E-07	6.63E-07	6.51E-07	6.07E-07	5.35E-07	4.94E-07	3.87E-07
Tetrachloroethylene	4.12E-02	3.92E-02	3.72E-02	3.31E-02	2.91E-02	2.50E-02	2.10E-02	1.69E-02	1.29E-02	8.81E-03	4.76E-03	7.06E-04
Toluene	3.83E-01	3.68E-01	3.52E-01	3.19E-01	2.86E-01	2.53E-01	2.19E-01	1.86E-01	1.53E-01	1.20E-01	8.62E-02	5.32E-02
Trichloroethylene	3.10E-01	2.96E-01	2.82E-01	2.51E-01	2.20E-01	1.88E-01	1.57E-01	1.26E-01	9.48E-02	6.36E-02	3.25E-02	1.29E-03
Vinyl Chloride	4.86E-04	4.64E-04	4.41E-04	3.93E-04	3.44E-04	2.95E-04	2.47E-04	1.98E-04	1.50E-04	1.01E-04	5.23E-05	3.61E-06
Xylene	4.76E-02	4.61E-02	4.43E-02	4.04E-02	3.68E-02	3.26E-02	2.87E-02	2.42E-02	2.03E-02	1.67E-02	1.30E-02	1.09E-02
Total	5.06E+00	4.88E+00	4.65E+00	4.35E+00	4.03E+00	3.74E+00	3.46E+00	3.08E+00	2.67E+00	2.28E+00	1.88E+00	1.49E+00
Maximum HAP Emission	1.90E+00	1.73E+00	1.56E+00	1.39E+00	1.21E+00	1.21E+00	1.31E+00	1.32E+00	1.29E+00	1.27E+00	1.26E+00	1.26E+00
Maximum HAP Emitted	Chloroform	Chloroform	Chloroform	Chloroform	Chloroform	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid	Hydrochloric Acid

Criteria Air Pollutant	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
SO2	5.70E-02	2.70E-01	4.69E-01	6.66E-01	2.74E-01	2.01E-01	1.76E-01	2.15E-01	1.76E-01	1.90E-01	1.95E+00	2.16E+00
NOx	2.62E+00	6.05E+00	9.12E+00	1.19E+01	3.84E+00	2.07E+00	2.06E+00	2.91E+00	1.66E+00	2.58E+00	2.93E+01	3.56E+01
CO	7.47E-01	1.90E+00	2.95E+00	3.94E+00	1.20E+00	7.68E-01	6.89E-01	8.65E-01	6.90E-01	9.22E-01	9.67E+00	1.16E+01
PM-10/2.5 & Condensable	3.28E-01	7.27E-01	1.10E+00	1.39E+00	3.02E-01	1.88E-01	1.64E-01	2.03E-01	1.46E-01	2.91E-01	2.99E+00	3.51E+00
VOCs	6.65E-02	3.14E-01	5.43E-01	7.77E-01	3.39E-01	2.37E-01	2.08E-01	2.61E-01	2.09E-01	2.22E-01	2.31E+00	2.66E+00

Note 1: NA indicates no emissions for Calendar Year 2018.

Appendix B

Data Records

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Table B-1; 2018 ICE Operations Summary

Facility	Engine ID	Fuel Rate	Rate Units	Annual Duration (hr)	Annual Fuel Consumption (gal or ft³)
Engines ≤ 600 hp					
AMWTP	BGEN-232-001	11.00	gal/hr	3.2	35.2
AMWTP	BGEN-RCE-001	4.90	gal/hr	127.7	625.7
ATR Complex	609-M-87	13.10	gal/hr	41.9	548.9
ATR Complex	619-10	26.00	gal/hr	14.0	362.7
ATR Complex	633-M-1	16.10	gal/hr	12.9	207.7
ATR Complex	680-M-1	11.10	gal/hr	2.5	27.8
ATR Complex	688-M-1	20.00	gal/hr	21.6	432.0
ATR Complex	688-M-2	20.00	gal/hr	10.9	218.0
CFA	TAN-687	3.26	gal/hr	10.9	35.5
CFA	CFA-609-001	8.33	gal/hr	41.9	349.0
CFA	CFA-1603-001	10.00	gal/hr	96.8	968.0
CFA	CFA-1603-002	10.00	gal/hr	70.3	703.0
CFA	PER-638-004	10.00	gal/hr	48.5	485.0
CFA	TAN-665-002	14.00	gal/hr	60.2	842.8
CFA	TAN-610-002	14.00	gal/hr	31.3	437.8
CFA	B8-601	2.88	gal/hr	3.7	10.7
CFA	B27-601	2.88	gal/hr	12.0	34.6
CFA	CFA-668-001	16.40	gal/hr	73.4	1203.8
CFA	ARA-632	7.40	gal/hr	10.2	75.5
CFA	TAN-601	3.44	gal/hr	25.7	88.4
CFA	CFA-609-002	4.3	gal/hr	66.7	286.8
CFA	B27-607/609	14.9	gal/hr	9.4	139.8
INTEC	MOT-YDA-202	4.50	gal/hr	2.8	12.7
INTEC	P-UTI-608	17.59	gal/hr	10.6	186.5
INTEC	P-UTI-673	19.15	gal/hr	79.3	1518.6
INTEC	P-UTI-672	19.15	gal/hr	50.0	957.5
INTEC	COM-UTI-616	23.80	gal/hr	24.0	571.2
RWMC	EFW-ENG-4301	7.24	gal/hr	26.0	188.2
RWMC	S GEN-RE501	8.12	gal/hr	8.7	70.6
RWMC	EFW-ENG-3901	13.20	gal/hr	28.3	373.6
RWMC	S-GEN-301	20.61	gal/hr	33.4	688.4
RWMC	BA-CMP-T1101	1.45	gal/hr	39.3	57.0
RWMC	S-GEN-T1401	1.93	gal/hr	0.0	0.0
RWMC	S-GEN-1	19.00	gal/hr	5.2	99.6
RWMC	HV-GEN-RE301	8.20	gal/hr	9.0	73.8
RWMC	S-GEN-RE401	8.20	gal/hr	19.8	162.4
RWMC	S-GEN-RE701	8.20	gal/hr	10.5	86.1
RWMC	S-GEN-RE801	8.20	gal/hr	486.5	3989.3
RWMC	S-GEN-RE901	15.50	gal/hr	9.2	142.6
MFC	ANL- 798--008	1.70	gal/hr	7.4	12.6
MFC	ANL-720-018	2.80	gal/hr	81.8	229.0
MFC	ANL-725	2.80	gal/hr	8.9	24.9
MFC	ANL-754-003	4.00	gal/hr	0.0	0.0
MFC	ANL-704-015	4.00	gal/hr	8.2	32.8
MFC	ANL-785-016	5.00	gal/hr	3.0	15.0
MFC	ANL-701-009	9.40	gal/hr	17.0	159.8
MFC	ANL- 774-001	9.00	gal/hr	10.9	98.1

Table B-1 (cont.)

Facility	Engine ID	Fuel Rate	Rate Units	Annual Duration (hr)	Annual Fuel Consumption (gal or ft^3)
MFC	ANL-720-017	9.00	gal/hr	2.3	20.7
MFC	ANL-768-028	9.00	gal/hr	0.0	0.0
MFC	ANL-1728	10.40	gal/hr	105.1	1093.0
MFC	ANL-752A-001	20.00	gal/hr	21.8	436.0
MFC	ANL-756	22.70	gal/hr	6.0	136.2
MFC	ANL-792A-002	21.00	gal/hr	29.0	609.0
MFC	ANL-707-002	21.00	gal/hr	27.2	571.2
MFC	ANL-709-008	24.00	gal/hr	14.0	336.0
MFC	ANL-709-016	24.00	gal/hr	15.0	360.0
MFC	ANL-785-017	28.00	gal/hr	8.6	240.8
MFC	ANL-787	11.40	gal/hr	9.3	106.0
MFC	ANL-1740	12.00	gal/hr	44.1	529.2
MFC	ANL-1729	13.60	gal/hr	8.8	119.7
SMC	TAN 675-010	15.60	gal/hr	52.1	812.8
				Total	23239.3
Liquified Natural Gas					
CFA	CFA-1611	1810.00	ft3/hr	10.7	19367.0
				Total	19367.0
Propane					
AMWTP	S1-GEN-1001	16.80	gal/hr	5.4	90.7
CFA	GE-B28601	8.40	gal/hr	27.8	233.5
				Total	324.2
Engines > 600 hp					
AMWTP	WMF-734	39.40	gal/hr	7.0	275.8
AMWTP	BGEN-812-001	27.10	gal/hr	5.0	134.1
AMWTP	BGEN-812-002	44.20	gal/hr	3.8	168.0
ATR Complex	670-M-42	Note 1	gal/hr		0.0
ATR Complex	670-M-43		gal/hr		13403.0
ATR Complex	674-M-6		gal/hr		1679.0
ATR Complex	786-M-1	123.10	gal/hr	29.0	3569.9
INTEC	GEN-WCS-002	119.23	gal/hr	16.0	1907.7
INTEC	GEN-WCS-004	119.23	gal/hr	15.0	1788.5
INTEC	GEN-WCS-006	119.23	gal/hr	16.0	1907.7
MFC	ANL-768-003	32.00	gal/hr	8.8	281.6
NRF	686-016	69.70	gal/hr	16.1	1122.2
NRF	686-017	69.70	gal/hr	16.9	1177.9
NRF	686-018	69.70	gal/hr	12.5	871.3
NRF	686-019	69.70	gal/hr	12.0	836.4
SMC	TAN 679-012	20.40	gal/hr	3.5	71.4
				Total	29194.4

Note 1: Fuel is calculated from fuel storage tank measurements.

Table B-2; 2018 INL Boiler Summary

		Facility				
		CFA	FI		NRF	SMC
	Fuel Type	Distillate (gallons)	Distillate (gallons)	Propane (gallons)	Distillate (gallons)	Distillate (gallons)
Month	January	3374.0	75850.0	17619.1	71245.0	23366.0
	February	3317.0	68687.0	13920.0	64987.0	20937.0
	March	3398.0	65648.0	9321.2	63615.0	20512.0
	April	2291.0	48472.0	6507.5	29708.0	14177.0
	May	66.0	35993.0	3812.8	1631.0	6328.0
	June	0.0	27282.0	1750.2	0.0	0.0
	July	7.0	28267.0	580.5	0.0	0.0
	August	0.0	23919.0	768.6	0.0	0.0
	September	0.0	15391.0	1942.1	1177.0	0.0
	October	2490.0	44699.0	6253.6	45110.0	10080.0
	November	3439.0	71053.0	9764.2	64759.0	21361.0
	December	4056.0	87694.0	15285.9	80473.0	28015.0
	Total	22438.0	592955.0	87525.8	422705.0	144776.0

Table B-3; Mobile Equipment Operation Hours

TSA-RE Monthly Mobile Equipment Hours of Operation														
Equip #	**Description**	**Fuel**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Q-020-008	Genie Manlift (Model Z45/25 DC)	Diesel	0	1	0	2	1	1	4	2	3	2	0	3
Q-120-002-A	Gehl Dynalift	Diesel	13	0	0	13	3	2	4	1	3	2	2	3
Q-120-002-B	Gehl Dynalift	Diesel	0	0	0	0	2	1	0	0	1	1	1	0
Q-042-002-B	Hyster Forklift (Model H50XM)	Propane	4	0	0	0	0	0	0	0	0	0	0	0
Q-042-002-C	Hyster Forklift (Model H50XM)	Propane	1	8	20	20	5	3	0	7	4	9	11	3
Q-042-002-D	Hyster Forklift (Model H50XM)	Propane	4	2	0	28	5	1	1	2	4	4	6	1
Q-042-003-B	Hyster Forklift (Model H80XM)	Propane	13	4	6	15	15	12	14	3	8	5	2	6
Q-180-102	Caterpillar GP-45K Forklift	Propane	2	1	0	0	0	1	4	0	0	1	0	0

Appendix C

Updated Equipment List

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Table C-1; Idaho National Laboratory Engine Information

Facility	Engine ID	Type[a]	New/ Existing	NSPS	Model Year	Installation Date	Max HP	Tier Cert	Ignition Type	Fuel Type[b]	Fuel Rate (gal/hr)[c]	Removed from Service	Included in Application	In Service at Issuance
AMWTP	S1-GEN 1001	ESG	E	NA	2001	2002	225	NA	SI	Propane	16.8	NA	Yes	Yes
AMWTP	BGEN-232-001	ESG	E	NA	2001	2002	380	NA	CI	Distillate	11	NA	Yes	Yes
AMWTP[f]	BGEN-RCE-001	AC	N	Subpart IIII	2008	2014	115	3	CI	Distillate	4.9	NA	No	No
AMWTP	BGEN-812-001	ESG	E	NA	2001	2002	755	NA	CI	Distillate	27.1	NA	Yes	Yes
AMWTP	BGEN-812-002	ESG	E	NA	2002	2002	900	NA	CI	Distillate	44.2	NA	Yes	Yes
AMWTP	WMF-734	ESG	E	NA	1987	2001	745	NA	CI	Distillate	39.4	NA	Yes	Yes
ATR Complex	609-M-87	EAC	E	NA	1988	1998	250	N/A	CI	Distillate	13.1	NA	Yes	Yes
ATR Complex	619-10	EFW	E	NA	-	1996	558	N/A	CI	Distillate	26	NA	Yes	Yes
ATR Complex	633-M-1	EFW	N	Subpart IIII	2009	2012	315	3	CI	Distillate	~16.1[e]	NA	Yes	Yes
ATR Complex	670-M-42	ESG	E	NA	1963	1967	2118	N/A	CI	Distillate	44 [d]	NA	Yes	Yes
ATR Complex	670-M-43	ESG	E	NA	1963	1967	2118	N/A	CI	Distillate	44 [d]	NA	Yes	Yes
ATR Complex	674-M-6	ESG	E	NA	1984	1985	2132	N/A	CI	Distillate	44 [d]	NA	Yes	Yes
ATR Complex	680-M-1	ESG	E	NA	1991	1991	250	N/A	CI	Distillate	11.1	NA	Yes	Yes
ATR Complex	688-M-1	EFW	E	NA	1999	2000	368	N/A	CI	Distillate	20	NA	Yes	Yes
ATR Complex	688-M-2	EFW	E	NA	1999	2000	368	N/A	CI	Distillate	20	NA	Yes	Yes
ATR Complex	786-M-1	ESG	E	NA	2001	2005	2593	1	CI	Distillate	123.1	NA	Yes	Yes
CFA	CFA-609-001	ESG	E	NA	1982	1987	166	NA	CI	Distillate	~8.33	NA	Yes	Yes
CFA	CFA-668-001	ESG	N	Subpart IIII	2010	2010	345	3	CI	Distillate	16.4	NA	Yes	Yes
CFA	CFA-1603-001	EFW	E	NA	1994	1994	196	NA	CI	Distillate	~10	NA	Yes	Yes
CFA	CFA-1603-002	EFW	E	NA	1994	1994	196	NA	CI	Distillate	~10	NA	Yes	Yes
CFA	CFA-1611	ESG	E	NA	1995	1996	220	NA	SI	LNG	1810 ft^3/hr	NA	Yes	Yes
CFA	PER-638-004	EFW	E	NA	1994	1994	196	NA	CI	Distillate	~10	NA	Yes	Yes
CFA	GE-B28601	ESG	E	NA	1995	1996	61	NA	SI	Propane	8.42	NA	Yes	Yes
~~CFA[g]~~	~~TAN-601~~	~~ESG~~	~~E~~	~~NA~~	~~2006~~	~~2007~~	~~55~~	~~1~~	~~SI~~	~~Propane~~	~~6.11~~	2017	Yes	Yes
CFA	TAN-610-002	EFW	E	NA	1978	1980	310	NA	CI	Distillate	14	NA	Yes	Yes

Table C-1 (cont.)

Facility	Engine ID	Type[a]	New/ Existing	NSPS	Model Year	Installation Date	Max HP	Tier Cert	Ignition Type	Fuel Type[b]	Fuel Rate (gal/hr)[c]	Removed from Service	Included in Application	In Service at Issuance
CFA	TAN-665-002	EFW	E	NA	1979	1981	310	NA	CI	Distillate	14	NA	Yes	Yes
CFA	TAN-687	ESG	E	NA	1988	1990	66	NA	CI	Distillate	~3.26	NA	Yes	Yes
~~CFA~~	~~B8-601~~	~~ESG~~	~~E~~	~~NA~~	~~1984~~	~~1984~~	~~61~~	~~NA~~	~~CI~~	~~Distillate~~	~~3.12~~	2016	Yes	Yes
CFA	B8-601	ESG	N	Subpart IIII	2015	2016	69	3	CI	Distillate	2.88	NA	No	No
CFA	B27-601	ESG	N	Subpart IIII	2015	2016	69	3	CI	Distillate	2.88	NA	No	No
CFA	ARA-632	ESG	N	Subpart IIII	2015	2016	217	3	CI	Distillate	7.40	NA	No	No
CFA	CFA-609-002	ESG	N	Subpart IIII	2012	2016	99	3	CI	Distillate	4.30	NA	No	No
CFA	TAN-601	ESG	N	Subpart IIII	2015	2017	69	3	CI	Distillate	3.44	NA	No	No
CFA	B27-607/609	ESG	N	Subpart IIII	2017	2018	320	4F	CI	Distillate	14.90	NA	No	No
INTEC	P-UTI-673	EFW	E	NA	1991	1991	370	NA	CI	Distillate	19.15	NA	Yes	Yes
INTEC	P-UTI-608	ESP	E	NA	1983	1984	340	NA	CI	Distillate	17.59	NA	Yes	Yes
INTEC	P-UTI-672	EFW	E	NA	1991	1991	370	NA	CI	Distillate	19.15	NA	Yes	Yes
INTEC	COM-UTI-616	EAC	E	NA	1997	1997	460	NA	CI	Distillate	23.8	NA	Yes	Yes
INTEC	GEN-WCS-002	ESG	E	NA	2000	2000	2304	1	CI	Distillate	119.23	NA	Yes	Yes
INTEC	GEN-WCS-004	ESG	E	NA	2000	2000	2304	1	CI	Distillate	119.23	NA	Yes	Yes
INTEC	GEN-WCS-006	ESG	E	NA	2000	2000	2304	1	CI	Distillate	119.23	NA	Yes	Yes
INTEC	MOT-YDA-202	ESP	E	NA	1988	1989	87	NA	CI	Distillate	4.5	NA	Yes	Yes
RWMC	FW-ENG-3901	EFW	E	NA	1980	1980	255	NA	CI	Distillate	13.2	NA	Yes	Yes
RWMC	FW-ENG-4301	EFW	N	Subpart IIII	2007	2007	140	3	CI	Distillate	7.24	NA	Yes	Yes
RWMC	S-GEN-301	ESG	N	Subpart IIII	2011	2011	398	3	CI	Distillate	20.61	NA	Yes	Yes
RWMC	S-GEN-RE501	ESG	N	Subpart IIII	2010	2010 – CERCLA 2012 – non-CERCLA	157	3	CI	Distillate	8.12	NA	Yes	Yes
RWMC	BA-CMP-T1101	EAC	N	Subpart IIII	2007	2008 – CERCLA 2012 – non-CERCLA	28	2	CI	Distillate	1.45	NA	Yes	Yes

Table C-1 (cont.)

Facility	Engine ID	Type[a]	New/ Existing	NSPS	Model Year	Installation Date	Max HP	Tier Cert	Ignition Type	Fuel Type[b]	Fuel Rate (gal/hr)[c]	Removed from Service	Included in Application	In Service at Issuance
RWMC	S-GEN-T1401	ESG	N	Subpart JJJJ	2010	2010	15	2	SI	Propane	NA	NA	Yes	Yes
RWMC	HV-GEN-RE301	ESG	N	Subpart IIII	2007	2007	364	3	CI	Distillate	8.2	NA	No	No
RWMC	S-GEN-RE401	ESG	N	Subpart IIII	2008	2008	364	3	CI	Distillate	8.2	NA	No	No
RWMC	S-GEN-RE701	ESG	N	Subpart IIII	2011	2011	364	3	CI	Distillate	8.2	NA	No	No
RWMC	S-GEN-RE801	ESG	N	Subpart IIII	2010	2010	364	3	CI	Distillate	8.2	NA	No	No
RWMC	S-GEN-RE901	ESG	N	Subpart IIII	2017	2017	234	3	CI	Distillate	15.5	NA	No	No
MFC	ANL-701	ESG	E	NA	1997	1997	143	NA	CI	Distillate	9.4	NA	Yes	Yes
MFC	ANL-704	ESG	E	NA	1986	1986	86	NA	CI	Distillate	4	NA	Yes	Yes
MFC	ANL-707-002	EFW	E	NA	1990	1990	460	NA	CI	Distillate	21	NA	Yes	Yes
MFC	ANL-709-008	ESG	E	NA	1993	1993	475	NA	CI	Distillate	24	NA	Yes	Yes
MFC	ANL-709-016	ESG	E	NA	1993	1993	475	NA	CI	Distillate	24	NA	Yes	Yes
MFC	ANL-720-17	ESG	E	NA	1981	1981	173	NA	CI	Distillate	~9.0	NA	Yes	Yes
MFC	ANL-720-18	ESG	E	NA	1980	1980	46	NA	CI	Distillate	~2.8	NA	Yes	Yes
MFC	ANL-725	ESG	E	NA	1998	1998	46	NA	CI	Distillate	2.8	NA	Yes	Yes
MFC	ANL-752A-001	ESG	E	NA	1989	1990	390	NA	CI	Distillate	~20	NA	Yes	Yes
MFC	ANL-754	EFW	E	NA	1960	~1960	77	NA	CI	Distillate	~4.0	NA	Yes	Yes
MFC	ANL-756	ESG	E	NA	2005	2006	450	NA	CI	Distillate	22.7	NA	Yes	Yes
MFC	ANL-768-003	ESG	E	NA	1950	~1950	741	NA	CI	Distillate	~32	NA	Yes	Yes
MFC	ANL-768-028	ESG	E	NA	1981	1981	173	NA	CI	Distillate	~9.0	NA	Yes	Yes
MFC	ANL- 774-001	ESG	E	NA	1973	1973	166	NA	CI	Distillate	~9.0	NA	Yes	Yes
MFC	ANL-785-016	ESG	E	NA	1975	1975	110	NA	CI	Distillate	5	NA	Yes	Yes
MFC	ANL-785-017	ESG	E	NA	1950	~1950	525	NA	CI	Distillate	~28	NA	Yes	Yes
MFC	ANL-787	ESG	E	NA	2008	2013	286	NA	CI	Distillate	10.6	NA	Yes	Yes
MFC	ANL-792A-002	ESG	E	NA	2003	2004	450	NA	CI	Distillate	21	NA	Yes	Yes
MFC	ANL- 798--008	ESG	E	NA	1981	1981	27	NA	CI	Distillate	1.7	NA	Yes	Yes
MFC	ANL-1728	ESG	N	Subpart IIII	2011	2013	230	2	CI	Distillate	10.4	NA	Yes	Yes

Table C-1 (cont.)

Facility	Engine ID	Type[a]	New/ Existing	NSPS	Model Year	Installation Date	Max HP	Tier Cert	Ignition Type	Fuel Type[b]	Fuel Rate (gal/hr)[c]	Removed from Service	Included in Application	In Service at Issuance
MFC	ANL-1740	ESG	N	Subpart IIII	2011	2015	237	3	CI	Distillate	12	NA	No	Yes
MFC	ANL-1729	ESG	N	Subpart IIII	2016	2017	235	3	CI	Distillate	13.6	NA	No	Yes
NRF	NRF-686-016	ESG	E	NA	1990	1991	1,443	NA	CI	Distillate	69.7	NA	Yes	Yes
NRF	NRF-686-017	ESG	E	NA	1990	1991	1,443	NA	CI	Distillate	69.7	NA	Yes	Yes
NRF	NRF-686-018	ESG	E	NA	1990	1991	1,443	NA	CI	Distillate	69.7	NA	Yes	Yes
NRF	NRF-686-019	ESG	E	NA	1990	1991	1,443	NA	CI	Distillate	69.7	NA	Yes	Yes
SMC	TAN 675-010	ESG	E	NA	1984	1984	598	NA	CI	Distillate	30.9	NA	Yes	Yes
SMC	TAN 679-012	ESG	E	NA	1985	1986	890	NA	CI	Distillate	44.8	NA	Yes	Yes

Notes:	
	a. ESG = Emergency Standby Generator, EFW = Emergency Fire Water Pump, EAC = Emergency Air Compressor, ESP = Emergency Standby Pump, AC = Air Compressor, G = Generator, FW = Fire Water Pump.
	b. Distillate = #1 or #2 Distillate Fuel Oil with 15 ppm maximum sulfur content, LNG = Liquefied Natural Gas
	c. Maximum hourly fuel consumption rate
	d. The fuel rate listed is the actual average fuel rate for the Advanced Test Reactor Complex (ATR) ESG units 670-M-42, 670-M-43, and 674-M-6. These units do not have loads connected to them that are capable of using the maximum design fuel rates (106 gph, 106 gph, and 108.1 gph respectively).
	e. ~ signifies that the data was estimated.
	f. Green highlighted entries indicate engines added after permit application submittal.
	g. Red highlighted entries with strike-through text entries indicate engines removed from service.

Table C-2; Idaho National Laboratory Boiler Information

Facility	Use of Boiler (%)		Boiler ID	Rated Capacity (MMBtu/hr)	Installation Date	Control Device	Fuel Type	Full Load Consumption Rate (gal/hr)	Actual Consumption Rate (gal/hr)	NSPS Applicability	Date Removed from Service	Included in Application	In Service at Issuance
	Space Heat	Process											
AMWTP	100	0	WMF-676-004A	12.55	6/7/2002	O_2 Trim	Propane	138.7	80.0	Dc	NA	Yes	Yes
AMWTP	100	0	WMF-676-005B	12.55	6/7/2002	O_2 Trim	Propane	138.7	80.0	Dc	NA	Yes	Yes
AMWTP	100	0	WMF-676-006C	12.55	6/7/2002	O_2 Trim	Propane	138.7	80.0	Dc	NA	Yes	Yes
AMWTP	100	0	WMF-676-007	2.0	6/7/2002	O_2 Trim	Propane	22.1	13.0	Dc	NA	Yes	Yes
CFA	100	0	CFA 608-001	1.5	1985	O2 Trim	#2 Diesel	10.7	0.75	NA	NA	Yes	Yes
CFA	100	0	CFA 609-005	2.1	1987	O2 Trim	#2 Diesel	15.0	5.8	NA	NA	Yes	Yes
INTEC	48	52	CPP-606-061	36.4	2000	O_2 Trim	#2 Diesel	216	32.3	Dc	NA	Yes	Yes
INTEC	48	52	CPP-606-062	36.4	2000	O_2 Trim	#2 Diesel	216	32.3	Dc	NA	Yes	Yes
INTEC	48	52	CPP-606-063	36.4	2000	O_2 Trim	#2 Diesel	216	32.3	Dc	NA	Yes	Yes
INTEC	48	52	CPP-606-064	36.4	2000	O_2 Trim	#2 Diesel	216	32.3	Dc	NA	Yes	Yes
~~NRF~~[b]	~~100~~	~~0~~	~~NRF-620-014 Boiler No.1~~	~~52.4~~	~~1961~~	~~O_2 Trim~~	~~#2 Diesel~~	~~470~~	~~107~~	~~NA~~	2018	Yes	Yes
NRF	100	0	Boiler No. 4	29.3	2016	O_2 Trim	#2 Diesel	209	209	Dc	NA	Yes	Yes
~~NRF~~	~~100~~	~~0~~	~~NRF-620-012 Boiler No.3~~	~~52.4~~	~~1961~~	~~O_2 Trim~~	~~#2 Diesel~~	~~470~~	~~97.2~~	~~NA~~	2018	Yes	Yes
NRF[a]	100	0	Boiler No. 5	29.3	2017	O_2 Trim	#2 Diesel	209	209	Dc	NA	No	No
SMC	90	10	TAN 679-067a	25	1987	O_2 Trim	#2 Diesel	167.5	35.4	NA	NA	Yes	Yes
SMC	90	10	TAN 679-068	25	1987	O_2 Trim	#2 Diesel	167.5	41.4	NA	NA	Yes	Yes

Notes: a. Green highlighted entries indicate boilers added after permit issuance.

b. Red highlighted entries with strike-through text entries indicate boilers removed from service.