Statement of Basis

Permit to Construct No. P-2012.0056
Project ID 61104

ON Semiconductor
Pocatello, Idaho

Facility ID 005-00017

Final

December 13, 2018
Dan Pitman
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
Btu	British thermal units
CAA	Clean Air Act
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GACT	Generally Available Control Technology
gpm	gallons per minute
HAPs	hazardous air pollutants
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PAH	polyaromatic hydrocarbons
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
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide

SO_x	sulfur oxides
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

ON Semiconductor, Inc. (ON) operates an integrated circuit manufacturing facility in Pocatello, Idaho. The ON site (Site) includes ten separate buildings on approximately 33 acres. The facility includes offices, chemical storage, support facilities, manufacturing, testing, and common space. A semiconductor is a device with electrical conductivity between that of a conductor and an insulator; its electrical characteristics are dependent on how the materials and circuitry inlayed in the substrate are configured and processed. Silicon has traditionally been the substrate used to manufacture semiconductors. Beginning with a thin silicon wafer cut from an ingot 10 to 20 centimeters (4 to 8 inches) in diameter, consecutive layers of complex circuitry are built up, one on top of another, to produce the completed chip. These layers of circuitry are created using a complex series of manufacturing processes that are repeated many times. The ON process is wafer fabrication. Because of the rapid and frequent changes made in the semiconductor industry, and in an effort to remain competitive, manufacturing processes require frequent revision. The ON process does not include blank wafer production or assembly and packaging of wafers into individual integrated circuits. Manufacturing steps used at the ON facility include the following:

1. Deposition;
2. Coating;
3. Etching; and
4. Doping.

These steps, and the wafer cleaning that occurs between each process, generate air emissions, either directly without control, or indirectly downstream of emission controls such as packed-bed scrubbers. In addition, wastewater treatment and parts cleaning are potential emission sources of regulated pollutants. Fuel combustion devices include hot water boilers, steam boilers and emergency generators.

Permitting History

This is the initial PTC for a new facility thus there is no permitting history.

Application Chronology

August 22, 2012	DEQ received an application fee.
August 28, 2012	DEQ received an application.
September 4 -19, 2012	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
September 27, 2012	DEQ determined that the application was complete.
November 14, 2016	DEQ terminated the application and informed ON Semiconductor that an updated application will need to be submitted.
December 12, 2016	DEQ met with ON Semiconductor and agreed to continue processing the 2012 application and would ask ON for any clarifications that are needed.
December 21, 2016	DEQ identified emission inventory issues for the applicant to address.
April 5, 2017	DEQ identified modeling information for that must be addressed.
July 11, 2017	ON responded with modeling information that was requested in the DEQ April 5, 2017 information request.
July 12, 2017	DEQ received updated emission inventories from the applicant.

May 25, 2018	DEQ identified emission inventory discrepancies for $PM_{10}/PM_{2.5}$ based on modeling review.
June 27, 2018	DEQ received updated emission inventories based on the May 25, 2018 request.
July 17, 2018	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
August 27, 2018	DEQ made available the draft permit and statement of basis for peer and regional office review.
September 5, 2018	DEQ made available the draft permit and statement of basis for applicant review.
October 31, 2018 – November 30, 2018	DEQ provided a public comment period on the proposed action.
November 17, 2018	DEQ received the permit processing fee.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Emissions Source	Emissions Source Description	Control Equipment	Emission Point ID No.
Boiler	Boiler, Building A, Teledyne Laars PH0850 IN0 9K01, 0.69 MMBtu/hr natural gas fired, installed 1987	---	ABOI
Boiler	Boiler, Building B, Sellers 15 Senior S-200-W, 6.70 MMBtu/hr natural gas fired, installed 1990	---	BBOIHWB
Boiler	Boiler, Building B, Sellers 15 Senior 175 HP, 5.86 MMBtu/hr natural gas fired, installed1995	---	BBOIST
Boiler	Boiler, Building C, Sellers 15 Senior S-200-W, 6.70 MMBtu/hr natural gas fired, installed 1982	---	CBOIHWB
Boiler	Boiler, Building D, Sellers 15 Senior S-200-W, 6.70 MMBtu/hr natural gas fired, installed 1982	---	DBOIHWB
Boiler	Boiler, Building D, Sellers 15 Commodore 125, 4.18 MMBtu/hr natural gas fired, installed 1983	---	DBOIST1
Boiler	Boiler, Building G, Lochinvar CWN1436PM,1.16 MMBtu/hr natural gas fired, installed 1997	---	GBOIHWE
Boiler	Boiler, Building G, Sellers 300-SH-LN-390, 10.04 MMBtu.hr natural gas fired, installed 1997	Low NO_x burner	GBOISB1
Boiler	Boiler, Building G, Sellers 300-SH-LN-390, 10.04 MMBtu.hr natural gas fired, installed 1997	Low NO_x burner	GBOISB2
Boiler	Boiler, Building G, Sellers 300-SH-LN-390, 10.04 MMBtu.hr natural gas fired, installed 1997	Low NO_x burner	GBOISB3
Emergency Generator	Emergency generator, Building B, Onan 15.0 RJC 15 kW, 20 HP, natural gas-fired, installed 1970	---	BEMGEN
Emergency Generator	Emergency generator, Building C, Onan 15.0 RJC 15 kW, 20 HP, natural gas-fired, installed 1974	---	CEMGENR
Emergency Generator	Emergency generator, Building C (outside, South side), Caterpillar 1250 kW, 1818 HP, diesel fired, installed 2001	---	CEMGENS
Emergency Generator	Emergency generator, Building D, Onan 30.0EK-15R/9336M 30 kW, 82 HP, natural gas-fired, installed 1983	---	DEMGEN

Emissions Source	Emissions Source Description	Control Equipment	Emission Point ID No.
Emergency Generator	Emergency generator, Building D Support Room 1138, Kohler 60RZ72 60 kW, 126 HP, natural gas-fired, installed 1996	---	DMREMGEN
Emergency Generator	Emergency generator, Building G (outside, East side), Caterpillar 1250 kW, 1818 HP, diesel fired, installed 1998	---	GEEMGEN
Emergency Generator	Emergency generator, Building G (outside, South side), Caterpillar 1825 kW, 2593 HP, diesel fired, installed 2005	---	GOEMGEN
Fab 9 & Fab 10	Building D Fab emissions controlled by scrubber1, DSCRUB 1	Wet scrubber, Harrington model 79-3	DSCRUBF 1, DSCRUBF2, or DSCRUBF3; two of three fans exhausting from scrubbers DSCRUB1 and DSCRUB2. One is in standby.
Fab 9 & Fab 10	Building D Fab emissions controlled by scrubber 2, DSCRUB 1 or 2	Wet scrubber, Harrington model 79-3	DSCRUBF 1, 2, or 3
Fab 9 & Fab 10	Building D Fab emissions controlled by scrubber 5, DSCRUB5	Wet scrubber, Harrington model ECH-55-5LB	DSCRUB5
Fab 9 & Fab 10	Building D Fab emissions controlled by scrubber 10, DSCRUB10	Wet scrubber, Harrington model ECH-44-3LB	DSCRUB10
Fab 9 & Fab 10	Building D Fab emissions controlled by scrubber 14, DSCRUB14	Wet scrubber, Harrington model ECH-33-5LB	DSCRUB14
Wastewater Treatment	Building F Fab emissions controlled by scrubber 1, FSCRUB1	Wet scrubber, Harrington model HPH 34-3	FSCRUB1
Fab 9 & Fab 10	Building H Fab emissions controlled by scrubber 1, HSCRUB1	Wet scrubber, Harrington model ECH-9 11-5LB	HSCRUB1
Fab 9 & Fab 10	Building H Fab emissions controlled by scrubber 2, HSCRUB2	Wet scrubber, Harrington model ECH-9 11-5LB	HSCRUB2
Fab 9 & Fab 10	Building H Fab emissions controlled by scrubber 3, HSCRUB3	Wet scrubber, Harrington model ECH-9 11-5LB	HSCRUB3
Fab 9 & Fab 10	Building H Fab emissions controlled by scrubber 4, HSCRUB4	Wet scrubber, Harrington model ECH-9 11-5LB	HSCRUB4
Fab 9 & Fab 10	Building H Fab emissions controlled by scrubber 7, HSCRUB7	Wet scrubber, Tri-mer model F/WR-10-48-2	Wet scrubber HSCRUB7 exhausted from two separate fans/stacks, HSCRUB7F1 and HSCRUB7F2
Cooling Tower	Cooling tower BCT1, Building B, 1870 gallons per minute (GPM); one tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e., July, August, and September)	---	BCT1
Cooling Tower	Cooling tower BCT2, Building B, 858 GPM; one tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e., July, August, and September)	---	BCT2

Emissions Source	Emissions Source Description	Control Equipment	Emission Point ID No.
Cooling Tower	Cooling tower CCT1, Building C, 1600 GPM; one tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e., July, August, and September)	---	CCT1
Cooling Tower	Cooling tower CCT2, Building C, 1600 GPM; one tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e., July, August, and September)	---	CCT2
Cooling Tower	Cooling tower DCT1, Building D, 1787 GPM; one tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e., July, August, and September)	---	DCT1
Cooling Tower	Cooling tower DCT2, Building D, 1787 GPM; one tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e., July, August, and September)	---	DCT2
Cooling Tower	Cooling tower GCT1, Building G, 3000 GPM; both towers (GCT1 and GCT2) are assumed to operate year round	---	GCT1
Cooling Tower	Cooling tower GCT2, Building G, 3000 GPM; both towers (GCT1 and GCT2) are assumed to operate year round	---	GCT2

Emissions Inventories

This permitting action is to establish a facility emissions cap in accordance with IDAPA 58.01.01.175. A facility emissions cap (FEC) is defined at IDAPA 58.01.01.176.03.c as "A facility-wide emission limitation expressed in tons per year, for any criteria pollutant or hazardous air pollutant established in accordance with Sections 176 through 181. A FEC is calculated using baseline actual emissions plus an operational variability component and a growth component. A FEC, which is based on a twelve (12) month rolling basis, must be set below major facility thresholds as defined in Sections 204 and 205."

Emission inventory calculations may be seen the Spreadsheet in Appendix A of this Statement of Basis.

These emissions are the limit for facility-wide emissions. The limits do not apply to any one individual emission unit.

Facility Emissions CAP

Table 2 FACILITY EMISSIONS CAP

	NOx	CO	SO_2	PM2.5	PM10	VOC	HAP
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Baseline	32.54	33.73	0.24	3.12	15.23	17.43	3.58
Operation Variability	-	-	-	-	-	12.02	2.25
Growth	2.7	4.53	0.03	0.42	2.12	5.72	1.12
FEC	35.23	38.26	0.27	3.54	17.35	35.17	2.4[1]/6.96[2]

1) Hydrofluoric acid (However, permit limit applies to any single HAP)
2) Aggregated HAPs

In accordance with IDAPA 58.01.01.176.03.e, the operational variability component is limited to the level of up to the significant emission rate (SER) minus one (1) ton per year but no more than the facility's potential to emit (PTE). ON's proposed operational variability component meets these criteria as shown in Table 3.

Table 3 OPERATIONAL VARIABILITY COMPONENTS

	NOx	CO	SO_2	PM2.5	PM10	VOC	HAP
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Operation Variability	-	-	-	-	-	12.02	2.25
Significant Emission Rate minus 1 ton	39	99	39	9	14	39	NA

Criteria Pollutant Modeled Emission Rates

Table 4 MODELED CRITERIA POLLUTANT EMISSIONS RATES
ON SEMICONDUCTOR FACILITY EMISSIONS CAP
SHORT-TERM CRITERIA POLLUTANT EMISSION RATES.

Stack ID	Emissions Source	NO_2[a] (lb/hr)[b]	CO[c] (lb/hr)	CO (lb/hr)	$PM_{2.5}$[d] (lb/hr)	PM_{10}[e] (lb/hr)
		1-hr	1-hr	8-hr	24-hr	24-hr
ABOI	Boiler	8.33E-02	7.00E-02	7.00E-02	6.33E-03	6.33E-03
BBOIHWB	Boiler	8.20E-01	6.89E-01	6.89E-01	6.24E-02	6.24E-02
BBOIST	Boiler	7.18E-01	6.03E-01	6.03E-01	5.46E-02	5.46E-02
CBOIHWB	Boiler	8.20E-01	6.89E-01	6.89E-01	6.24E-02	6.24E-02
DBOIHWB	Boiler	8.20E-01	6.89E-01	6.89E-01	6.24E-02	6.24E-02
DBOIST1	Boiler	5.13E-01	4.31E-01	4.31E-01	3.90E-02	3.90E-02
GBOIHWE	Boiler	1.41E-01	1.18E-01	1.18E-01	1.07E-02	1.07E-02
GBOISB1	Boiler	8.20E-01	1.38E+00	1.38E+00	1.25E-01	1.25E-01
GBOISB2	Boiler	8.20E-01	1.38E+00	1.38E+00	1.25E-01	1.25E-01
GBOISB3	Boiler	8.20E-01	1.38E+00	1.38E+00	1.25E-01	1.25E-01
GBOISB4	Boiler	6.15E-01	1.03E+00	1.03E+00	9.35E-02	9.35E-02
BEMGEN	Emergency Generator[f]	0[g]	9.68E-01	1.21E-01	2.10E-04	2.10E-04
CEMGENR	Emergency Generator[f]	0[g]	9.68E-01	1.21E-01	2.10E-04	2.10E-04
CEMGENS	Emergency Generator[f,h]	0[g]	3.01E+00	1.69	6.56E-02	6.76E-02
DEMGEN	Emergency Generator[f]	0[g]	2.28E+00	2.85E-01	4.95E-04	4.95E-04
DMREMGEN	Emergency Generator[f]	0[g]	3.44E+00	4.30E-01	7.92E-04	7.92E-04
GEEMGEN	Emergency Generator[f,h]	0[g]	4.07E+00	2.29	6.25E-02	6.44E-02
GOEMGEN	Emergency Generator[f,h]	0[g]	1.37E+00	7.71E-01	9.03E-02	9.31E-02
FSCRUB1	Waste Water Treatment	0	0	0	1.21E-01	2.12E-01
LS	Lime Silo	0	0	0	4.65E-04	1.79E-03
BCT1	Cooling Tower	0	0	0	7.57E-04	2.34E-01
BCT2	Cooling Tower	0	0	0	7.57E-04	2.34E-01
CCT1	Cooling Tower	0	0	0	6.72E-04	2.08E-01
CCT2	Cooling Tower	0	0	0	6.72E-04	2.08E-01
DCT1	Cooling Tower	0	0	0	2.02E-03	6.25E-01
DCT2	Cooling Tower	0	0	0	2.02E-03	6.25E-01
GCT1	Cooling Tower	0	0	0	2.52E-03	7.81E-01
GCT2	Cooling Tower	0	0	0	1.26E-03	3.91E-01
GCT3	Cooling Tower	0	0	0	1.26E-03	3.91E-01
BHWH	Comfort Heater	7.19E-03	3.06E-03	3.06E-03	5.81E-04	5.81E-04
BUH-1	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-2	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-3	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-5	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-6	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BMAU-1	Comfort Heater	1.47E-02	6.27E-03	6.27E-03	1.19E-03	1.19E-03
CHWH	Comfort Heater	6.91E-03	2.94E-03	2.94E-03	5.59E-04	5.59E-04
CUH-1	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
CUH-2	Comfort Heater	2.76E-02	1.18E-02	1.18E-02	2.24E-03	2.24E-03
CUH-3	Comfort Heater	2.76E-02	1.18E-02	1.18E-02	2.24E-03	2.24E-03

GEXF29	Comfort Heater	1.84E-02	7.84E-03	7.84E-03	1.49E-03	1.49E-03
EHWH	Comfort Heater	1.83E-02	7.80E-03	7.80E-03	1.48E-03	1.48E-03
FUH-1	Comfort Heater	1.20E-02	5.10E-03	5.10E-03	9.69E-04	9.69E-04
FUH-2	Comfort Heater	1.20E-02	5.10E-03	5.10E-03	9.69E-04	9.69E-04
FMAUR-1	Comfort Heater	2.84E-02	1.21E-02	1.21E-02	2.29E-03	2.29E-03
GH10UH-1	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03

a) Nitrogen dioxide.
b) Pounds per hour.
c) Carbon monoxide.
d) Particulate matter with a mean aerodynamic diameter of 2.5 microns or less.
e) Particulate matter with a mean aerodynamic diameter of 10 microns or less.
f) The emergency generators undergo weekly maintenance tests which are conducted for 15-30 minutes. Therefore, they are modeled to emit pollutants for one hour at one-half of the emission rate (i.e., 50 hours/year at half of the emission rate, or equivalently, 100 hours/year at the full emission rate).
g) Emergency electrical generator engines are exempted from 1-hour NO_2 SIL and NAAQS modeling per DEQ policy[5].
h) In a November 26, 2018 e-mail from ON Semiconductor's Teri Bowman to Daniel Pitman, ON indicated that the diesel-fired emergency generators will undergo annual testing according to the following testing schedule: 1 hour at 20% load, 1 hour at 40% load, 1 hour at 60% load, and 1 hour at 80% load. Although only two of the three diesel generators will be tested in one day (4.5 hours per generator per day) and the third on the following day (4.5 hours per day), a worst-case scenario where all three diesel emergency generators operate 4.5 hours per day was used for modeling purposes.

Criteria modeled emissions rates are detailed in the Modeling Memorandum in Appendix B of this Statement of Basis and in the spreadsheet in Appendix A of this Statement of Basis. Appendix A contains a summary of the emission inventory; the actual spreadsheet is available for review upon request.

Toxic Air Pollutant Facility Baseline (Fab 9 & Fab 10)

Baseline toxic air pollutant emissions rates are documented in Table 5 for "Facility process emissions" (i.e. Fab 9 & Fab 10). These emissions rates are used in Permit to Construct equation 5.1.

Table 5 FAB 9 AND FAB 10 BASELINE TAP EMISSIONS

Toxic Air Pollutants	Total Baseline (lb/hr)
ethyl alcohol	3.45E-03
N-Amyl Acetate	2.08E-03
Boron trifloride	1.19E-05
n-butyl alcohol	1.79E-03
n-butyl acetate	1.50E-02
Cresol	1.06E-03
propylene glycol monomethyl ether acetate	2.36E-02
1-Methoxy-2-propanol	2.83E-02
Nitrogen Trifluoride	2.98E-03
Potassium Hydroxide	2.08E-04
Sodium Metabisulfite	6.85E-04
Isopropanol	5.20E-01
Nitrous oxide	4.93E-02
Acetone	1.32E+00
2-Heptanone	2.50E-01
4-methyl 2-pentanone	2.29E-01
Phosphine	6.66E-04
Catechol	4.34E-02
Sodium Hydoxide	5.04E-03
Arsine	7.99E-04

Tetraethylorthosilicate	3.71E-01
Silicon tetrahydride	3.81E-02
Acetic Acid	1.59E-01
Magnesium Hydroxide	6.51E-03
Hydrogen Bromide	7.40E-03
Ammonia	1.96E-01
Silica, amorphous	2.06E-01
Nitric Acid	1.21E-01
Hydrogen Chloride	6.51E-02
Silicon Dioxide	9.30E-04
Phosphoric acid	1.67E-01
Hydrogen Peroxide	3.03E-01
Sulfuric acid	7.32E-01

Ambient Air Quality Impact Analyses

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix B.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in a portion of Bannock County which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions ≥ 10 T/yr or if the aggregate of all HAPS (Total HAPs) has actual or potential emissions ≥ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits ≥ 8 T/yr of a single HAP or ≥ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown.

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are ≥ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

Table 6 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	<100	~20	**100**	B
PM_{10}	<100	17.36	**100**	B
$PM_{2.5}$	<100	3.54	**100**	B
SO_2	<100	0.27	**100**	B
NO_X	<100	35.23	**100**	B
CO	<100	38.26	**100**	B
VOC	<100	35.36	**100**	B
HAP (single)	UNK	2.4	**10**	UNK
HAP (total)	UNK	6.94	**25**	UNK
Pb	<100	<<1	**100**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 .... Permit to Construct Required

The permittee has requested that a FEC PTC be issued to the existing facility. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.176-181, and IDAPA 58.01.01.200-228.

Procedures and Requirements for Permits Establishing a Facility Emissions Cap (IDAPA 58.01.01.175)

The permittee has requested to be issued an optional facility emissions cap (FEC) permit in accordance with IDAPA 58.01.01.176 -181.

Section 181 authorizes facility changes that comply with the terms and conditions establishing the FEC, but that are not included in the estimate of ambient concentration analysis approved for the permit establishing the FEC. No permit revision shall be required for facility changes implemented in accordance with Section 181.

Future changes at the facility under the terms and conditions of the FEC permit are required to be modeled using the potential emission rates, actual emission unit locations and stack parameters as specified by IDAPA 58.01.01.181. The modeling results approved for the permit establishing the FEC provides predictions of ambient impacts (or design concentrations) for each receptor. If impacts from the changes at the facility allowed under the FEC permit have less than a significant impact above design concentrations then the facility may make the change without notifying DEQ but records shall be maintained on-site (IDAPA 58.01.01.181.02). If changes allowed under the FEC permit cause ambient impacts that are greater than a significant impact over the design concentrations then notice shall be provided to the Department in advance of the change in accordance with IDAPA 58.01.01.181.01.b. Changes that cause or significantly contribute to a violation of an ambient standard are not allowed by the FEC permit.

Section 180 specifies when revisions are required to terms and conditions establishing a FEC. A permit revision is required for the following:

a. A change to existing monitoring, reporting or recordkeeping requirements in the permit establishing the FEC;

b. A change to the FEC; or

c. A change to the facility that would impose new requirements not included in the permit establishing the FEC.

The FEC emission limits were established in accordance with IDAPA 58.01.01.176.03.c. In order to establish the facility emission cap (FEC), after establishing the baseline actual emissions (BAE), the facility establishes an operational variability component and then adds a growth component.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 .... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 .... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity.

Rules for Control Fugitive Dust Emissions (IDAPA 58.01.01.650-651)

IDAPA 58.01.01.650-651 .... Fugitive Dust Emissions

All sources of fugitive dust emissions at the facility are subject to the State of Idaho rules for controlling fugitive dust. Reasonable precautions shall be taken to prevent particulate matter from becoming airborne. This requirement is assured by requirements in the Facility-Wide Section of the permit including those for periodic inspections of potential sources of fugitive dust and for maintaining specific records.

Odors (IDAPA 58.01.01.775-776)

IDAPA 58.01.01.775-776 .... Odors

In accordance with Sections 775-776 of the Rules, the permittee shall not allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids to the atmosphere in such quantities as to cause air pollution. To demonstrate compliance the permittee is required to do the following: maintain records of all odor complaints received. If the complaint has merit, the permittee shall take appropriate corrective action as expeditiously as practicable. The records shall, at a minimum, include the date that each complaint was received and a description of the following: the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 .... Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, SO_2, NO_X, CO, and VOC or 10 tons per year for any one HAP or 25 tons per year for all HAPs combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 .... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

40 CFR 60, Subpart Dc....................................... Standards of Performance for Small Industrial–Commercial–Institutional Steam Generating Units

DEQ is delegated this Subpart.

Section (a) specifies that the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).

At the time of issuance of this permit, only three of the facility's boilers are affected units subject to Subpart Dc. These boilers are located in Building G and are identified as GBOISB1, GBOISB2, GBOISB3; each of these boilers is a Sellers model 300-SH-LN-390 boiler with a rated capacity of 10.04 MMBtu/hr. However, the only requirements that apply are the following:

1) Notification requirements of 40 CFR 60.48c(a):

> "The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction and actual startup, as provided by §60.7 of this part. This notification shall include:
>
> (1) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.
>
> (2) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §60.42c, or §60.43c.
>
> (3) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.
>
> (4) Notification if an emerging technology will be used for controlling SO_2 emissions. The Administrator will examine the description of the control device and will determine whether the technology qualifies as an emerging technology. In making this determination, the Administrator may require the owner or operator of the affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of §60.42c(a) or (b)(1), unless and until this determination is made by the Administrator.

2) Recordkeeping requirements of 40 CFR 60.48c(g):

> (1) Except as provided under paragraphs (g)(2) and (g)(3) of this section, the owner or operator of each affected facility shall record and maintain records of the amount of each fuel combusted during each operating day.
>
> (2) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in §60.48c(f) to demonstrate compliance with the SO2 standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.
>
> (3) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility or multiple affected facilities located on a contiguous property unit where the only fuels combusted in any steam generating unit (including steam generating units not subject to this subpart) at that property are natural gas, wood, distillate oil meeting the most current requirements in §60.42C to use fuel certification to demonstrate compliance with the SO2 standard, and/or fuels, excluding coal and residual oil, not subject to an emissions standard (excluding opacity) may elect to record and maintain records of the total amount of each steam generating unit fuel delivered to that property during each calendar month."

40 CFR 60, Subpart IIII .... Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

§60.4200 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:

(i) 2007 or later, for engines that are not fire pump engines;

(ii) The model year listed in Table 3 to this subpart or later model year, for fire pump engines.

ON is not a manufacturer of engines therefore these paragraphs do not apply.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

All of the engines at the facility were manufacture prior to April 1, 2006, therefore these paragraphs do not apply.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

ON's application did not indicate that any of the engines were modified or reconstructed; therefore this paragraph does not apply.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

ON indicated that one of the compression ignition engines was installed in 2005, all others were installed prior to this date. Regarding the engine that was installed in 2005 it is not known whether it was constructed, as that term is defined (i.e. ordered), after July 11, 2005. This regulatory review will presume that it was. Under that presumption the provisions of §60.4208 are potentially applicable. After reviewing this subsection the provisions of §60.4208 do not apply because the engine was installed prior to any of dates listed in §60.4208 (see the list below). Therefore, there are no applicable emission standards or operating requirements from this subpart that apply.

§60.4208 What is the deadline for importing or installing stationary CI ICE produced in previous model years?

(a) After December 31, 2008, owners and operators may not install stationary CI ICE (excluding fire pump engines) that do not meet the applicable requirements for 2007 model year engines.

(b) After December 31, 2009, owners and operators may not install stationary CI ICE with a maximum engine power of less than 19 KW (25 HP) (excluding fire pump engines) that do not meet the applicable requirements for 2008 model year engines.

(c) After December 31, 2014, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 19 KW (25 HP) and less than 56 KW (75 HP) that do not meet the applicable requirements for 2013 model year non-emergency engines.

(d) After December 31, 2013, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 56 KW (75 HP) and less than 130 KW (175 HP) that do not meet the applicable requirements for 2012 model year non-emergency engines.

(e) After December 31, 2012, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 130 KW (175 HP), including those above 560 KW (750 HP), that do not meet the applicable requirements for 2011 model year non-emergency engines.

(f) After December 31, 2016, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 560 KW (750 HP) that do not meet the applicable requirements for 2015 model year non-emergency engines.

(g) After December 31, 2018, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power greater than or equal to 600 KW (804 HP) and less than 2,000 KW (2,680 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that do not meet the applicable requirements for 2017 model year non-emergency engines.

(h) In addition to the requirements specified in §§60.4201, 60.4202, 60.4204, and 60.4205, it is prohibited to import stationary CI ICE with a displacement of less than 30 liters per cylinder that do not meet the applicable requirements specified in paragraphs (a) through (g) of this section after the dates specified in paragraphs (a) through (g) of this section.

(i) The requirements of this section do not apply to owners or operators of stationary CI ICE that have been modified, reconstructed, and do not apply to engines that were removed from one existing location and reinstalled at a new location.

40 CFR 60, Subpart JJJJ .... Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

§60.4230 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (6) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary SI ICE with a maximum engine power less than or equal to 19 kilowatt (KW) (25 horsepower (HP)) that are manufactured on or after July 1, 2008.

(2) Manufacturers of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) that are gasoline fueled or that are rich burn engines fueled by liquefied petroleum gas (LPG), where the date of manufacture is:

(i) On or after July 1, 2008; or

(ii) On or after January 1, 2009, for emergency engines.

(3) Manufacturers of stationary SI ICE with a maximum engine power greater than 19 KW (25 HP) that are not gasoline fueled and are not rich burn engines fueled by LPG, where the manufacturer participates in the voluntary manufacturer certification program described in this subpart and where the date of manufacture is:

(i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);

(ii) On or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP;

(iii) On or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or

(iv) On or after January 1, 2009, for emergency engines.

(4) Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:

(i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);

(ii) on or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP;

(iii) on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or

(iv) on or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 HP).

(5) Owners and operators of stationary SI ICE that are modified or reconstructed after June 12, 2006, and any person that modifies or reconstructs any stationary SI ICE after June 12, 2006.

(6) The provisions of §60.4236 of this subpart are applicable to all owners and operators of stationary SI ICE that commence construction after June 12, 2006.

None of the stationary spark ignition engines at the facility were constructed, modified or reconstructed after any of the applicability dates listed in (1) through (6) above.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT/GACT Applicability (40 CFR 63)

40 CFR 63, Subpart ZZZZ.................................National Emission Standards for Hazardous Air Pollutants Reciprocating Internal Combustion Engines

A detailed regulatory review of this subpart is provided in Appendix C.

40 CFR 63, Subpart BBBBB ....National Emission Standards for Hazardous Air Pollutants for Semiconductor Manufacturing

In accordance with 40 CFR 63.7181 this subpart only applies to major sources of HAPs. ON is not a major source of HAP therefore this subpart does not apply.

Permit Conditions Review

This section describes the permit conditions for this initial permit.

Facility-Wide Conditions

Facility-wide Permit Conditions 2.1 through 2.4 incorporate the fugitive emissions standards of IDAPA 58.01.01.650–651 and DEQ's standard language for monitoring to assure compliance.

Facility-wide Permit Conditions 2.5 and 2.6 include the odor standards of IDAPA 58.01.01.776.01 and monitoring requirements.

Facility-wide Permit Condition 2.7 through 2.9 includes the visible emission standard of IDAPA 58.01.01.625 and DEQ's standard monitoring requirements.

Facility-wide Permit Condition 2.10 includes the open burning Rule of IDAPA 58.01.01.600–623.

Facility-wide Permit Condition 2.11 includes the address to which reports shall be submitted.

Facility-wide Permit Condition 2.12 includes the obligation to comply requirements of IDAPA 58.01.01.212.01.

Facility-wide Permit Condition 2.13 includes the fuel burning equipment particulate matter standards for gaseous fuel combustion of IDAPA 58.01.01.212.01. The application indicated that the only fuel consumed in fuel burning equipment is natural gas. Combusting natural gas is inherently in compliance with the emission standard.

Facility-wide Permit Condition 2.14 includes the distillate fuel sulfur content standard of IDAPA 58.01.01.725. Permit Condition 2.15 requires monitoring of fuel sulfur content.

Facility-wide Permit Condition 2.15 includes DEQ's standard language for incorporating federal requirements. Should there be a conflict between the permit and the federal regulation, the federal regulations shall govern.

Facility Emissions Cap Requirements

All of the permit conditions in the section of the permit originate from DEQ's standard language for facility emission cap permits.

Permit Condition 3.3 lists the facility emissions caps (FECs) in accordance with IDAPA 58.01.01.178.01.

Permit Condition 3.4 and all of its subsections require monitoring and recordkeeping requirements to assure compliance with the criteria pollutant FEC limits. Monitoring of parameters that are used in the emission estimation methodologies included in ON's second emission inventory spreadsheet provided on June 27, 2018, is required. DEQ has recorded that spreadsheet as revision 8.1. Permit Condition 3.4.4 requires each month totaling facility-wide emissions during the previous consecutive 12-month period. These conditions are in accordance with IDAPA 58.01.01.178.02 & 03.

Permit Condition 3.5 and all of its subsections mirror permit conditions is Section 3.4 except that instead of criteria pollutants it is HAP pollutants that most to monitored. These conditions are in accordance with IDAPA 58.01.01.178.02 & 03.

Permit Condition 3.6.1 is DEQ's standard language for FEC permits regarding toxic air pollutant emissions. This applies to any physical or operational change at the facility that result in an increase of toxic air pollutant emissions.

Permit Condition 3.7.1 includes the reporting requirements of IDAPA 58.01.01.04. The report shall include, but is not limited to, all methods, equations, emissions factors, and sources for emissions factors not previously identified used to determine the 12-month total facility-wide criteria pollutant and HAP emissions. Records of the fuel consumption, pounds of process throughput, hours of operation, total dissolved solids in the cooling water, and water flow rate used for determining the 12-month total facility-wide criteria pollutant and HAP emissions shall be submitted with the annual report. A report is due for each calendar year and is due before January 30th.

General FEC Conditions 3.8 and 3.9 include general FEC permit conditions that are DEQ's standard language. These sections are in accordance with IDAPA 58.01.01.179.02, 58.01.01.177 and 58.01.01.177.02.d. These conditions address notice and recordkeeping of ambient concentration estimate, and renewal requirements respectively.

Permit Condition 3.10.1 is DEQ's standard language for FEC permits requiring that a listing of emissions units at the facility be maintained.

Semiconductor and Support Operations

Permit Conditions 4.3.1 through 4.3.7

In calculating emissions for hazardous and toxic air pollutants credit is given to reduction in emissions from some emissions units because emissions are controlled by a scrubber. This section of the permit has conditions regarding operation of those scrubbers. They match the permit conditions for scrubbers in the ON Semiconductor Nampa Facility FEC permit and are also based on the scrubber conditions in the Micron Boise Facility FEC permit.

Permit Condition 4.3.7

Not all emissions are required to be passed through a scrubber. For those that do, and for which the applicant wishes to credit emissions reductions due to the scrubbers, those scrubbers must be operated according to manufacturer's specifications to achieve at least 90% reduction of toxic and hazardous air pollutant emissions through the scrubber.

Permit Conditions 4.4.1 & 4.4.2

Natural Gas-Fired Boilers

Permit Condition 6.2 limits boiler fuel to natural gas consistent with the application submitted to obtain this permit.

Permit Conditions 6.3.1 and 6.3.2 incorporate the applicable requirements of 40 CFR 60 Subpart Dc.

Emergency Generators

Permit Condition 7.2 limits fuel use to ultra low sulfur (15ppm by weight) distillate fuel oil consistent with the application.

Permit Condition 7.3 limits the daily hours of operation of the emergency engines for purpose of maintenance and readiness testing based on the applicants comments during the public comment period.

Permit Condition 7.4 requires monitoring of hours of operation to assure compliance with limitations.

Permit Conditions 7.5 through 7.13 incorporates the applicable provisions of 40 CFR 63 Subpart ZZZZ.

Initial Permit Condition 8.1

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Initial Permit Condition 8.2

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 8.3

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Initial Permit Condition 8.4

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Initial Permit Condition 8.5

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Initial Permit Condition 8.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.01 and 211.03.

Initial Permit Condition 8.7

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Initial Permit Condition 8.8

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Initial Permit Condition 8.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 60 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Initial Permit Condition 8.10

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Initial Permit Condition 8.11

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Initial Permit Condition 8.12

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Initial Permit Condition 8.13

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Initial Permit Condition 8.14

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Initial Permit Condition 8.15

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Initial Permit Condition 8.16

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period was made available to the public in accordance with IDAPA 58.01.01.209.01.c. During this time, comments were submitted in response to DEQ's proposed action. Refer to the chronology for public comment period dates.

A response to public comments document has been crafted by DEQ based on comments submitted during the public comment period. That document is part of the final permit package for this permitting action.

APPENDIX A – EMISSIONS INVENTORIES

Emission Unit ID	Stack ID	NOx			CO				SO_2				
		1-Hour Averaging Period	Annual Averaging Period	Annual Averaging Period	1-Hour Averaging Period	8-Hour Averaging Period	Annual Averaging Period	Annual Averaging Period	1-Hour Averaging Period	3-Hour Averaging Period	24-Hour Averaging Period	Annual Averaging Period	Annual Averaging Period
		lbs/hr	lbs/hr	tons/yr	lbs/hr	lbs/hr	lbs/hr	tons/yr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	tons/yr
ABOI	ABOI	8.33E-02	8.33E-02	3.65E-01	7.00E-02	7.00E-02	7.00E-02	3.07E-01	5.00E-04	5.00E-04	5.00E-04	5.00E-04	2.19E-03
BBOIHWB	BBOIHWB	8.20E-01	8.20E-01	3.59E+00	6.89E-01	6.89E-01	6.89E-01	3.02E+00	4.92E-03	4.92E-03	4.92E-03	4.92E-03	2.16E-02
BBOIST	BBOIST	7.18E-01	7.18E-01	3.14E+00	6.03E-01	6.03E-01	6.03E-01	2.64E+00	4.31E-03	4.31E-03	4.31E-03	4.31E-03	1.89E-02
CBOIHWB	CBOIHWB	8.20E-01	8.20E-01	3.59E+00	6.89E-01	6.89E-01	6.89E-01	3.02E+00	4.92E-03	4.92E-03	4.92E-03	4.92E-03	2.16E-02
DBOIHWB	DBOIHWB	8.20E-01	8.20E-01	3.59E+00	6.89E-01	6.89E-01	6.89E-01	3.02E+00	4.92E-03	4.92E-03	4.92E-03	4.92E-03	2.16E-02
DBOIST1	DBOIST1	5.13E-01	5.13E-01	2.25E+00	4.31E-01	4.31E-01	4.31E-01	1.89E+00	3.08E-03	3.08E-03	3.08E-03	3.08E-03	1.35E-02
GBOIHWE	GBOIHWE	1.41E-01	1.41E-01	6.16E-01	1.18E-01	1.18E-01	1.18E-01	5.18E-01	8.44E-04	8.44E-04	8.44E-04	8.44E-04	3.70E-03
GBOISB1	GBOISB1	8.20E-01	8.20E-01	3.59E+00	1.38E+00	1.38E+00	1.38E+00	6.04E+00	9.85E-03	9.85E-03	9.85E-03	9.85E-03	4.31E-02
GBOISB2	GBOISB2	8.20E-01	8.20E-01	3.59E+00	1.38E+00	1.38E+00	1.38E+00	6.04E+00	9.85E-03	9.85E-03	9.85E-03	9.85E-03	4.31E-02
GBOISB3	GBOISB3	8.20E-01	8.20E-01	3.59E+00	1.38E+00	1.38E+00	1.38E+00	6.04E+00	9.85E-03	9.85E-03	9.85E-03	9.85E-03	4.31E-02
GBOISB4	GBOISB4	6.15E-01	6.15E-01	2.70E+00	1.03E+00	1.03E+00	1.03E+00	4.53E+00	7.38E-03	7.38E-03	7.38E-03	7.38E-03	3.23E-02
BEMGEN	BEMGEN	5.75E-01	6.56E-03	2.87E-02	9.68E-01	1.21E-01	1.10E-02	4.84E-02	1.53E-04	5.10E-05	6.37E-06	1.75E-06	7.65E-06
CEMGENR	CEMGENR	5.75E-01	6.56E-03	2.87E-02	9.68E-01	1.21E-01	1.10E-02	4.84E-02	1.53E-04	5.10E-05	6.37E-06	1.75E-06	7.65E-06
CEMGENS	CEMGENS	2.39E+01	2.73E-01	1.20E+00	3.01E+00	3.76E-01	3.44E-02	1.51E-01	9.53E-03	3.18E-03	3.97E-04	1.09E-04	4.76E-04
DEMGEN	DEMGEN	1.35E+00	1.54E-02	6.76E-02	2.28E+00	2.85E-01	2.60E-02	1.14E-01	3.60E-04	1.20E-04	1.50E-05	4.11E-06	1.80E-05
DMREMGEN	DMREMGEN	2.22E+00	2.54E-02	1.11E-01	3.44E+00	4.30E-01	3.92E-02	1.72E-01	5.76E-04	1.92E-04	2.40E-05	6.57E-06	2.88E-05
GEEMGEN	GEEMGEN	2.65E+01	3.03E-01	1.33E+00	4.07E+00	5.09E-01	4.65E-02	2.04E-01	9.08E-03	3.03E-03	3.78E-04	1.04E-04	4.54E-04
GOEMGEN	GOEMGEN	1.77E+01	2.02E-01	8.83E-01	1.37E+00	1.71E-01	1.56E-02	6.85E-02	1.3127E-02	4.38E-03	5.47E-04	1.50E-04	6.56E-04
FAB 9 & FAB 10	FAB 9 & FAB 10	--	--	--	--	--	--	--	--	--	--	--	--
FSCRUB1	FSCRUB1	--	--	--	--	--	--	--	--	--	--	--	--
LS	LS	--	--	--	--	--	--	--	--	--	--	--	--
BCT1	BCT1	--	--	--	--	--	--	--	--	--	--	--	--
BCT2	BCT2	--	--	--	--	--	--	--	--	--	--	--	--
CCT1	CCT1	--	--	--	--	--	--	--	--	--	--	--	--
CCT2	CCT2	--	--	--	--	--	--	--	--	--	--	--	--
DCT1	DCT1	--	--	--	--	--	--	--	--	--	--	--	--
DCT2	DCT2	--	--	--	--	--	--	--	--	--	--	--	--
GCT1	GCT1	--	--	--	--	--	--	--	--	--	--	--	--
GCT2	GCT2	--	--	--	--	--	--	--	--	--	--	--	--
GCT3	GCT3	--	--	--	--	--	--	--	--	--	--	--	--
BHWH	BHWH	7.19E-03	4.73E-03	2.07E-02	3.06E-03	3.06E-03	2.01E-03	8.81E-03	4.59E-05	4.59E-05	4.59E-05	3.02E-05	1.32E-04
BUH-1	BUH-1	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
BUH-2	BUH-2	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
BUH-3	BUH-3	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
BUH-4	BUH-4	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
BUH-5	BUH-5	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
BUH-6	BUH-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BMAU-1	BMAU-1	1.47E-02	9.70E-03	4.25E-02	6.27E-03	6.27E-03	4.13E-03	1.81E-02	9.41E-05	9.41E-05	9.41E-05	6.19E-05	2.71E-04
CHWH	CHWH	6.91E-03	4.54E-03	1.99E-02	2.94E-03	2.94E-03	1.93E-03	8.47E-03	4.41E-05	4.41E-05	4.41E-05	2.90E-05	1.27E-04
CUH-1	CUH-1	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
CUH-2	CUH-2	2.76E-02	1.82E-02	7.96E-02	1.18E-02	1.18E-02	7.74E-03	3.39E-02	1.76E-04	1.76E-04	1.76E-04	1.16E-04	5.08E-04
CUH-3	CUH-3	2.76E-02	1.82E-02	7.96E-02	1.18E-02	1.18E-02	7.74E-03	3.39E-02	1.76E-04	1.76E-04	1.76E-04	1.16E-04	5.08E-04
GMAU-2	GEXF29	1.84E-02	1.21E-02	5.31E-02	7.84E-03	7.84E-03	5.16E-03	2.26E-02	1.18E-04	1.18E-04	1.18E-04	7.74E-05	3.39E-04
EHWH	EHWH	1.83E-02	1.21E-02	5.28E-02	7.80E-03	7.80E-03	5.13E-03	2.25E-02	1.17E-04	1.17E-04	1.17E-04	7.70E-05	3.37E-04
FUH-1	FUH-1	1.20E-02	7.88E-03	3.45E-02	5.10E-03	5.10E-03	3.35E-03	1.47E-02	7.65E-05	7.65E-05	7.65E-05	5.03E-05	2.20E-04
FUH-2	FUH-2	1.20E-02	7.88E-03	3.45E-02	5.10E-03	5.10E-03	3.35E-03	1.47E-02	7.65E-05	7.65E-05	7.65E-05	5.03E-05	2.20E-04
FMAUR-1	FMAUR-1	2.84E-02	1.87E-02	8.17E-02	1.21E-02	1.21E-02	7.94E-03	3.48E-02	1.81E-04	1.81E-04	1.81E-04	1.19E-04	5.22E-04
GH10UH-1	GH10UH-1	2.30E-02	1.51E-02	6.64E-02	9.80E-03	9.80E-03	6.45E-03	2.82E-02	1.47E-04	1.47E-04	1.47E-04	9.67E-05	4.24E-04
	Total	80.16	8.04	35.23	24.70	10.61	8.74	38.26	0.10	0.07	0.06	0.06	0.27

PM-2.5				PM-10				VOC	HAP
1-Hour Averaging Period	24-Hour Averaging Period	Annual Averaging Period	Annual Averaging Period	1-Hour Averaging Period	24-Hour Averaging Period	Annual Averaging Period	Annual Averaging Period	Annual Averaging Period	Annual Averaging Period
lbs/hr	lbs/hr	lbs/hr	tons/yr	lbs/hr	lbs/hr	lbs/hr	tons/yr	tons/yr	tons/yr
6.33E-03	6.33E-03	6.33E-03	2.77E-02	6.33E-03	6.33E-03	6.33E-03	2.77E-02	2.01E-02	6.89E-03
6.24E-02	6.24E-02	6.24E-02	2.73E-01	6.24E-02	6.24E-02	6.24E-02	2.73E-01	1.98E-01	6.78E-02
5.46E-02	5.46E-02	5.46E-02	2.39E-01	5.46E-02	5.46E-02	5.46E-02	2.39E-01	1.73E-01	5.93E-02
6.24E-02	6.24E-02	6.24E-02	2.73E-01	6.24E-02	6.24E-02	6.24E-02	2.73E-01	1.98E-01	6.78E-02
6.24E-02	6.24E-02	6.24E-02	2.73E-01	6.24E-02	6.24E-02	6.24E-02	2.73E-01	1.98E-01	6.78E-02
3.90E-02	3.90E-02	3.90E-02	1.71E-01	3.90E-02	3.90E-02	3.90E-02	1.71E-01	1.24E-01	4.24E-02
1.07E-02	1.07E-02	1.07E-02	4.68E-02	1.07E-02	1.07E-02	1.07E-02	4.68E-02	3.39E-02	1.16E-02
1.25E-01	1.25E-01	1.25E-01	5.46E-01	1.25E-01	1.25E-01	1.25E-01	5.46E-01	3.95E-01	1.36E-01
1.25E-01	1.25E-01	1.25E-01	5.46E-01	1.25E-01	1.25E-01	1.25E-01	5.46E-01	3.95E-01	1.36E-01
1.25E-01	1.25E-01	1.25E-01	5.46E-01	1.25E-01	1.25E-01	1.25E-01	5.46E-01	3.95E-01	1.36E-01
9.35E-02	9.35E-02	9.35E-02	4.10E-01	9.35E-02	9.35E-02	9.35E-02	4.10E-01	2.96E-01	1.02E-01
5.05E-03	2.10E-04	5.76E-05	2.52E-04	5.05E-03	2.10E-04	5.76E-05	2.52E-04	3.85E-04	4.22E-04
5.05E-03	2.10E-04	5.76E-05	2.52E-04	5.05E-03	2.10E-04	5.76E-05	2.52E-04	3.85E-04	4.22E-04
3.50E-01	1.46E-02	3.99E-03	1.75E-02	3.60E-01	1.50E-02	4.11E-03	1.80E-02	6.25E-02	4.95E-04
1.19E-02	4.95E-04	1.36E-04	5.94E-04	1.19E-02	4.95E-04	1.36E-04	5.94E-04	9.06E-04	9.92E-04
1.90E-02	7.92E-04	2.17E-04	9.50E-04	1.90E-02	7.92E-04	2.17E-04	9.50E-04	1.45E-03	1.59E-03
3.33E-01	1.39E-02	3.81E-03	1.67E-02	3.44E-01	1.43E-02	3.92E-03	1.72E-02	5.50E-02	4.72E-04
4.82E-01	2.01E-02	5.50E-03	2.41E-02	4.96E-01	2.07E-02	5.67E-03	2.48E-02	3.80E-02	6.82E-04
--	--	--	--	--	--	--	--	3.25E+01	6.10E+00
1.21E-01	1.21E-01	1.03E-03	4.53E-03	2.12E-01	2.12E-01	1.81E-03	7.94E-03	2.66E-03	0.00E+00
1.12E-02	4.65E-04	9.56E-05	4.19E-04	4.30E-02	1.79E-03	3.68E-04	1.61E-03	--	--
7.57E-04	7.57E-04	7.57E-04	3.31E-03	2.34E-01	2.34E-01	2.34E-01	1.03E+00	--	--
7.57E-04	7.57E-04	3.78E-04	1.66E-03	2.34E-01	2.34E-01	1.17E-01	5.13E-01	--	--
6.72E-04	6.72E-04	6.72E-04	2.95E-03	2.08E-01	2.08E-01	2.08E-01	9.12E-01	--	--
6.72E-04	6.72E-04	3.36E-04	1.47E-03	2.08E-01	2.08E-01	1.04E-01	4.56E-01	--	--
2.02E-03	2.02E-03	2.02E-03	8.84E-03	6.25E-01	6.25E-01	6.25E-01	2.74E+00	--	--
2.02E-03	2.02E-03	1.01E-03	4.42E-03	6.25E-01	6.25E-01	3.12E-01	1.37E+00	--	--
2.52E-03	2.52E-03	2.52E-03	1.10E-02	7.81E-01	7.81E-01	7.81E-01	3.42E+00	--	--
1.26E-03	1.26E-03	1.26E-03	5.52E-03	3.91E-01	3.91E-01	3.91E-01	1.71E+00	--	--
1.26E-03	1.26E-03	1.26E-03	5.52E-03	3.91E-01	3.91E-01	3.91E-01	1.71E+00	--	--
5.81E-04	5.81E-04	3.82E-04	1.67E-03	5.81E-04	5.81E-04	3.82E-04	1.67E-03	1.21E-03	4.16E-04
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.19E-03	1.19E-03	7.84E-04	3.43E-03	1.19E-03	1.19E-03	7.84E-04	3.43E-03	2.48E-03	8.52E-04
5.59E-04	5.59E-04	3.67E-04	1.61E-03	5.59E-04	5.59E-04	3.67E-04	1.61E-03	1.16E-03	4.00E-04
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
2.24E-03	2.24E-03	1.47E-03	6.44E-03	2.24E-03	2.24E-03	1.47E-03	6.44E-03	4.66E-03	1.60E-03
2.24E-03	2.24E-03	1.47E-03	6.44E-03	2.24E-03	2.24E-03	1.47E-03	6.44E-03	4.66E-03	1.60E-03
1.49E-03	1.49E-03	9.80E-04	4.29E-03	1.49E-03	1.49E-03	9.80E-04	4.29E-03	3.11E-03	1.07E-03
1.48E-03	1.48E-03	9.75E-04	4.27E-03	1.48E-03	1.48E-03	9.75E-04	4.27E-03	3.09E-03	1.06E-03
9.69E-04	9.69E-04	6.37E-04	2.79E-03	9.69E-04	9.69E-04	6.37E-04	2.79E-03	2.02E-03	6.93E-04
9.69E-04	9.69E-04	6.37E-04	2.79E-03	9.69E-04	9.69E-04	6.37E-04	2.79E-03	2.02E-03	6.93E-04
2.29E-03	2.29E-03	1.51E-03	6.61E-03	2.29E-03	2.29E-03	1.51E-03	6.61E-03	4.78E-03	1.64E-03
1.86E-03	1.86E-03	1.22E-03	5.36E-03	1.86E-03	1.86E-03	1.22E-03	5.36E-03	3.88E-03	1.33E-03
2.14	**0.98**	**0.81**	**3.54**	**5.99**	**4.75**	**3.96**	**17.36**	**35.16**	**6.95**

ON Semiconductors, Pocatello, ID

HAP Summary

									A	B	C	D	E	F = ∑A+B+C+D+E
Hazardous Air Pollutants	**CAS #**	**CAA HAP**	**Source**	**Fab 9 HAP?**	**Fab 10 HAP?**	**Facility HAP?**	**Boiler HAP?**	**Emergency Generator HAP?**	**Fab 9 (lb/hr)**	**Fab 10 (lb/hr)**	**Facility (lb/hr)**	**Boiler (lb/hr)**	**Emergency Generator (lb/hr)**	**HAP Baseline (lb/hr)**
Arsenic	7440-38-2	Yes	Boiler				yes					1.77E-05		1.77E-05
Cadmium	7440-43-9	Yes	Boiler				yes					9.72E-05		9.72E-05
Chromium	7440-47-3	Yes	Boiler				yes					1.24E-04		1.24E-04
Cobalt	7440-48-4	Yes	Boiler				yes					7.42E-06		7.42E-06
Hexane	110-54-3	Yes	Boiler				yes					1.59E-01		1.59E-01
Manganese	7439-96-5	Yes	Boiler				yes					3.36E-05		3.36E-05
Mercury	7439-97-6	Yes	Boiler				yes					2.30E-05		2.30E-05
Nickel	7440-02-0	Yes	Boiler				yes					1.86E-04		1.86E-04
Benzene	71-43-2	Yes	Boiler & EG				yes	yes				1.86E-04	1.96E-02	1.98E-02
Benzo(a)pyren	50-32-8	Yes	Boiler & EG				yes	yes				1.06E-07	5.38E-06	5.49E-06
Formaldehyde	50-00-0	Yes	Boiler & EG				yes	yes				6.63E-03	4.49E-02	5.16E-02
Naphthalene	91-20-3	Yes	Boiler & EG				yes	yes				5.39E-05	2.93E-03	2.98E-03
Toluene	108-88-3	Yes	Boiler & EG				yes	yes				3.01E-04	7.07E-03	7.37E-03
1,1,2,2-Tetrachloroethane	79-34-5	Yes	EG					yes					5.34E-05	5.34E-05
1,1,2-Trichloroethane	79-00-5	Yes	EG					yes					3.23E-05	3.23E-05
1,1-Dichloroethane	75-34-3	Yes	EG					yes					2.39E-05	2.39E-05
1,2-Dichloropropane	78-87-5	Yes	EG					yes					2.74E-05	2.74E-05
1,3-Butadiene	106-99-0	Yes	EG					yes					1.40E-03	1.40E-03
1,3-Dichloropropene	542-75-6	Yes	EG					yes					2.68E-05	2.68E-05
1,2-Dichloroethane	107-06-2	Yes	EG					yes					2.39E-05	2.39E-05
Acetaldehyde	75-07-0	Yes	EG					yes					6.42E-03	6.42E-03
Acrolein	107-02-8	Yes	EG					yes					5.72E-03	5.72E-03
Carbon Tetrachloride	56-23-5	Yes	EG					yes					3.74E-05	3.74E-05
Chlorobenzene	108-90-7	Yes	EG					yes					2.72E-05	2.72E-05
Ethylene Dibromide	106-93-4	Yes	EG					yes					5.24E-05	5.24E-05
Methanol	67-56-1	Yes	EG					yes					6.46E-03	6.46E-03
Methylene Chloride	75-09-2	Yes	EG					yes					8.70E-05	8.70E-05
PAHs	NA	Yes	EG					yes					2.01E-03	2.01E-03
Styrene	100-42-5	Yes	EG					yes					2.51E-05	2.51E-05
Vinyl Chloride	75-01-4	Yes	EG					yes					1.52E-05	1.52E-05
xylene	1330-20-7	Yes	EG & Facility	yes				yes	0.00E+00				4.46E-03	4.46E-03
4-methyl 2-pentanone	108-10-1	Yes	Facility	yes	yes				5.33E-02	1.76E-01				2.29E-01
Arsine	7784-42-1	Yes	Facility	yes	yes				4.36E-04	3.62E-04				7.99E-04
Catechol	120-80-9	Yes	Facility		yes					4.34E-02				4.34E-02
Chlorine	7782-50-5	Yes	Facility	yes	yes				0.00E+00	0.00E+00				0.00E+00
Chloroform	66-67-3	Yes	Facility	yes					0.00E+00					0.00E+00
Cresol	1319-77-3	Yes	Facility	yes	yes				9.09E-04	1.48E-04				1.06E-03
Ethylene glycol	107-21-1	Yes	Facility			yes					NA			0.00E+00
Hydrofluoric acid	7664-39-3	Yes	Facility	yes	yes				1.07E-01	1.47E-01				2.54E-01
Hydrogen Chloride	7647-01-0	Yes	Facility	yes	yes				3.74E-02	2.77E-02				6.51E-02
Phosphine	7803-51-2	Yes	Facility	yes	yes				2.81E-04	3.85E-04				6.66E-04
propylene glycol monoethyl ether acetate	108-65-6	Yes	Facility	yes	yes				2.36E-02	0.00E+00				2.36E-02
propylene glycol monomethyl ether	107-98-2	Yes	Facility	yes	yes				0.00E+00	2.83E-02				2.83E-02
Total		Yes							0.22	0.42	0.00	0.17	0.10	0.91

G	H	I	J	K	L = ∑G+H+I+J+K	M = F*391040/217601-F	N = L*391040/217601-L	O = (F+M)*.2 or ∑GBOIS1,2,3 * .6667	P = (L+N)*.2 or ∑GBOIS1,2,3 * .6668	∑F+M+O	∑L+N+P
Fab 9 (ton/yr)	Fab 10 (ton/yr)	Facility (ton/yr)	Boiler (ton/yr)	Emergency Generator (ton/yr)	HAP Baseline (ton/yr)	Operational Variablity (lb/hr)	Operational Variablity (ton/yr)	Proposed Growth (lb/hr)	Proposed Growth (ton/yr)	FEC (PTE) (lb/hr)	FEC (PTE) (ton/yr)
			7.74E-05		7.74E-05	NA	NA	2.46E-06	1.08E-05	2.01E-05	8.82E-05
			4.26E-04		4.26E-04	NA	NA	1.35E-05	5.93E-05	1.11E-04	4.85E-04
			5.42E-04		5.42E-04	NA	NA	1.72E-05	7.55E-05	1.41E-04	6.17E-04
			3.25E-05		3.25E-05	NA	NA	1.03E-06	4.53E-06	8.46E-06	3.70E-05
			6.97E-01		6.97E-01	NA	NA	2.22E-02	9.70E-02	1.81E-01	7.94E-01
			1.47E-04		1.47E-04	NA	NA	4.68E-06	2.05E-05	3.83E-05	1.68E-04
			1.01E-04		1.01E-04	NA	NA	3.20E-06	1.40E-05	2.62E-05	1.15E-04
			8.13E-04		8.13E-04	NA	NA	2.58E-05	1.13E-04	2.11E-04	9.26E-04
			8.13E-04	9.80E-04	1.79E-03	NA	NA	2.58E-05	1.13E-04	1.98E-02	1.91E-03
			4.65E-07	2.69E-07	7.34E-07	NA	NA	1.48E-08	6.47E-08	5.51E-06	7.98E-07
			2.90E-02	2.25E-03	3.13E-02	NA	NA	9.23E-04	4.04E-03	5.25E-02	3.53E-02
			2.36E-04	1.46E-04	3.83E-04	NA	NA	7.51E-06	3.29E-05	2.99E-03	4.15E-04
			1.32E-03	3.53E-04	1.67E-03	NA	NA	4.18E-05	1.83E-04	7.41E-03	1.85E-03
				2.67E-06	2.67E-06	NA	NA	NA	NA	5.34E-05	2.67E-06
				1.62E-06	1.62E-06	NA	NA	NA	NA	3.23E-05	1.62E-06
				1.19E-06	1.19E-06	NA	NA	NA	NA	2.39E-05	1.19E-06
				1.37E-06	1.37E-06	NA	NA	NA	NA	2.74E-05	1.37E-06
				7.00E-05	7.00E-05	NA	NA	NA	NA	1.40E-03	7.00E-05
				1.34E-06	1.34E-06	NA	NA	NA	NA	2.68E-05	1.34E-06
				1.19E-06	1.19E-06	NA	NA	NA	NA	2.39E-05	1.19E-06
				3.21E-04	3.21E-04	NA	NA	NA	NA	6.42E-03	3.21E-04
				2.86E-04	2.86E-04	NA	NA	NA	NA	5.72E-03	2.86E-04
				1.87E-06	1.87E-06	NA	NA	NA	NA	3.74E-05	1.87E-06
				1.36E-06	1.36E-06	NA	NA	NA	NA	2.72E-05	1.36E-06
				2.62E-06	2.62E-06	NA	NA	NA	NA	5.24E-05	2.62E-06
				3.23E-04	3.23E-04	NA	NA	NA	NA	6.46E-03	3.23E-04
				4.35E-06	4.35E-06	NA	NA	NA	NA	8.70E-05	4.35E-06
NA	NA			1.01E-04	1.01E-04	NA	NA	NA	NA	2.01E-03	1.01E-04
				1.26E-06	1.26E-06	NA	NA	NA	NA	2.51E-05	1.26E-06
				7.58E-07	7.58E-07	NA	NA	NA	NA	1.52E-05	7.58E-07
0.00E+00				2.23E-04	2.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.46E-03	2.23E-04
2.34E-01	7.69E-01				1.00E+00	1.82E-01	7.99E-01	8.23E-02	3.60E-01	4.94E-01	2.16E+00
1.91E-03	1.59E-03				3.50E-03	6.37E-04	2.79E-03	2.87E-04	1.26E-03	1.72E-03	7.54E-03
	1.90E-01				1.90E-01	3.46E-02	1.51E-01	1.56E-02	6.83E-02	9.36E-02	4.10E-01
0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00					0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.98E-03	6.48E-04				4.63E-03	8.42E-04	3.69E-03	3.80E-04	1.66E-03	2.28E-03	9.98E-03
		0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.69E-01	6.42E-01				1.11E+00	2.02E-01	8.86E-01	9.12E-02	3.99E-01	5.47E-01	2.40E+00
1.64E-01	1.21E-01				2.85E-01	5.19E-02	2.27E-01	2.34E-02	1.03E-01	1.40E-01	6.15E-01
1.23E-03	1.69E-03				2.92E-03	5.31E-04	2.33E-03	2.39E-04	1.05E-03	1.44E-03	6.29E-03
1.03E-01	0.00E+00				1.03E-01	1.88E-02	8.24E-02	8.49E-03	3.72E-02	5.09E-02	2.23E-01
0.00E+00	1.24E-01				1.24E-01	2.26E-02	9.89E-02	1.02E-02	4.46E-02	6.11E-02	2.67E-01
0.98	**1.85**	**0.00**	**0.73**	**0.01**	**3.56**	**0.51**	**2.25**	**0.26**	**1.12**	**1.68**	**6.94**

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: December 7, 2018

TO: Daniel Pitman, P.E., Permit Writer, Air Program

FROM: Pao Baylon, Modeling Review Analyst, Air Program
Darrin Mehr, Modeling Review Analyst, Air Program

PROJECT: P-2012.0056 PROJ 61104 – Facility Emissions Cap (FEC) Tier II Permit Application from ON Semiconductor for the Existing Facility in Pocatello, Idaho

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.403.02 (NAAQS) and 403.03 (TAPs) for a FEC Tier II Issued Pursuant to IDAPA 58.01.01.401.05

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a Non-Carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
ACFM	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ARM	Old Ambient Ratio Method
ARM2	New Ambient Ratio Method
ASOS	Automated Surface Observing Systems
bhp	Brake horsepower
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
Btu/hr	British Thermal Units per hour
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon monoxide
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
FEC	Facility Emissions Cap
FEM	Federal Equivalent Method
fps	Feet per second
GEP	Good Engineering Practice
HAP	Hazardous Air Pollutant
hr	Hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
m	Meters
m/s	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NEI	National Emissions Inventory
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO	Nitrogen oxide
NO_2	Nitrogen dioxide
NO_x	Oxides of Nitrogen
NOV	Notice of Violation
NWS	National Weather Service
ON	ON Semiconductor Pocatello
O_3	Ozone
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers

$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
POU	Point-Of-Use abatement system
ppb	Parts Per Billion
PRIME	Plume Rise Model Enhancement
PTC	Permit to Construct
PTE	Potential to Emit
Q	Emissions rate factor
SIL	Significant Impact Level
SO_2	Sulfur dioxide
TAP	Toxic Air Pollutant
tons/year	Ton(s) per year
T/yr	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOCs	Volatile Organic Compounds
WGS	World Geodetic System
$\mu g/m^3$	Micrograms per cubic meter
χ	Chi - an ambient impact factor

1.0 Summary

1.1 General Project Summary

On August 28, 2012, ON Semiconductor (ON) submitted a Facility Emissions Cap (FEC) Permit to Construct (PTC) application for their existing integrated circuit manufacturing facility in Pocatello, Idaho. Because of the rapid and frequent changes necessary to keep up with evolving technologies, a FEC on criteria pollutants would allow ON Semiconductor the flexibility to adapt to market changes. Various circumstances, including staff changes and other pressing DEQ priorities, resulted in backlogging of the project. In 2017, the project was restarted and DEQ requested for additional information to support ON's ambient air impact analyses, and ON Semiconductor submitted a response to DEQ on July 11, 2017. It was determined that DEQ staff would perform the necessary changes to the already submitted analyses. DEQ reviewed the submitted documents, constructed the facility set-up on a modeling interface, and performed preliminary air impact simulations.

This memorandum provides a summary of the ambient air impact analyses performed by DEQ's modeling staff for the ON Semiconductor facility in Pocatello. It also describes DEQ's review of the submitted documents, DEQ's updates to the model set-up, additional clarifications, and conclusions. The model set-up and input data that is described in detail in this memorandum should be used by ON Semiconductor as baseline for future modeling simulations as allowed under the FEC.

Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were performed by DEQ, using the most recent documents (i.e., emission inventory, building coordinates, stack parameters) that ON Semiconductor submitted on July 2017 and June 2018, to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard as required by IDAPA 58.01.01.203.02 and 203.03 for Permits to Construct (Idaho Air Rules Section 203.02 and 203.03) and Idaho Air Rules Section 403.02 for Tier II Operating Permits.

The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that the estimated emissions from the facility, as allowed by the FEC permit, will not cause or significantly contribute to a violation of any applicable air quality standard or Toxic Air Pollutant (TAP) increment. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. Evaluation of emission estimates is the responsibility of the permit writer and is addressed in the main body of the Statement of Basis. The accuracy of emission estimates was not evaluated as part of DEQ's review of the air impact analyses described in this modeling review memorandum.

The air quality impact analyses described in this memorandum: 1) utilized appropriate methods and models according to established DEQ/EPA rules, policies, guidance, and procedures; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the facility as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from applicable emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air locations where and when the project has a significant impact; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the project do not result in increased ambient air impacts exceeding allowable TAP increments. Table 1 presents key assumptions and results to be considered in the development of the permit.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
Appendix W Requirements. Modeled emission rates must represent those associated with design capacity or as limited by a permit restriction corresponding to the applicable averaging period of the NAAQS, as required by 40 CFR 51, Appendix W - *Guideline on Air Quality Models* (Appendix W).	Although a FEC permit allows certain facility changes to be made, provided the annual FEC limit is not exceeded, modeled rates must still meet the requirements of Appendix W.
Modeling for Changes. Any operating scenarios, additional emission points, emission rates greater than modeled, altered release point location, or altered physical release parameters not accurately represented in the air impact analyses must be evaluated for compliance with any applicable significant impact level (SIL); and if a SIL is exceeded by the change, compliance with the applicable NAAQS must be demonstrated.	As required by Idaho Air Rules Section 181, the air impact modeling analysis must be modified for changes from the analyses finalized at the date of permit issuance. Notification must be provided to DEQ for changes in impacts exceeding the SIL. For those changes that are less than the SIL, the applicant must maintain documentation on-site.
FEC Limits. FECs are annual limitations in units of tons/year (T/yr), which are specifically requested by the applicant. The three components to the FEC limitation are: • Baseline actual emissions; • Operational variability emissions; and • Future growth. ON Semiconductor modeled emissions that were the sum of baseline actual emissions, operational variability, and future growth to demonstrate compliance with the NAAQS.	The following compares requested FECs (see Table 4) to modeled rates: • NOx FEC = 35.23 T/yr; modeled annual rate = 35.23 T/yr; modeled 1-hour rate 8.04 pounds/hour (lb/hr) (equal to 35.24 T/yr if continuously emitted). • $PM_{2.5}$ FEC = 3.54 T/yr; modeled annual rate = 3.54 T/yr; modeled 24-hour rate = 0.98 lb/hr (equal to 4.30 T/yr if continuously emitted). • PM_{10} FEC = 17.35 T/yr; modeled 24-hour rate = 4.75 lb/hr (equal to 20.82 T/yr if continuously emitted). • CO FEC = 38.26 T/yr; modeled 1-hour rate = 8.74 lb/hr (equal to 38.31 T/yr if continuously emitted). • SO_2 FEC = 0.27 T/yr; no modeling because current PTE is less than BRC. Modeling analyses must be revised if any future changes result in emission increases beyond what was used in the model or result in a substantial change in release characteristics from what was used in the model (such that resulting modeled concentrations could be affected). Idaho Air Rules Section 181 specifies how facility changes are handled under a FEC. This memo's model set-up and meteorological data form the basis for the ambient impact analyses used to evaluate the ambient impacts due to the change. If the change in modeled impacts (from what was submitted in the application and approved by this memorandum) does not cause exceedance of the annual FEC limit and the change in the modeled design value is less than the SIL, ON Semiconductor may make the process and/or equipment change without notifying DEQ. If the change in AERMOD model output design concentrations exceeds any SIL (but does not cause or contribute to a NAAQS violation), notice must be provided to DEQ as per Idaho Air Rules Section 181.b. Ambient background concentrations, AERMOD model version, and the meteorological data files for the effective term of this permit will be the same as those used for the application's final ambient impact analyses.
SO_2 Annual Facility Emissions Cap (FEC). SO_2 emissions were not modeled for the FEC. Baseline actual emissions and	The facility requested a FEC of 0.27 tons per year (T/yr) of SO_2. The SO_2 FEC cap consists of the following:

proposed growth component represent the facility's current potential to emit (PTE).	• Baseline actual emissions: 0.24 T/yr • Operational variability emissions: 0 T/yr • Proposed growth emissions: 0.03 T/yr. The project was exempted from modeling SO_2 based on the BRC regulatory interpretation policy for NAAQS compliance demonstration requirements[1]. Because SO_2 impact analyses were not conducted for this project, ON Semiconductor must conduct an ambient impact assessment if future projects increase the facility-wide PTE to a value above the SO_2 BRC level of 4 T/yr.
Intermittent Emissions from Emergency Generators. The facility includes 3 natural gas-fired emergency generators (BEMGEN, CEMGENR, DMREMGEN) and 3 diesel-fired emergency generators (CEMGENS, GEEMGEN, GOEMGEN). All emergency generators are only operated once per week for up to a half hour for testing and maintenance purposes under no load. For natural gas generators, the exhaust flow rate and temperature at 100% loading were used for modeling purposes. For diesel generators, the exhaust flow rate and temperature at 50% loading were used for modeling purposes. The requested annual hours of operation are 100 total hours per year based on allowable operations for emergency engines and represent actual baseline hours + operational variability hours. In addition to weekly engine testing, the diesel-fired emergency generators will undergo annual testing according to the following testing schedule: 1 hour at 20% load, 1 hour at 40% load, 1 hour at 60% load, and 1 hour at 80% load. Although only two diesel generators will be tested in one day (4.5 hours per generator per day) and the third on the following day (4.5 hours per day), a worst-case scenario where all three diesel emergency generators operate 4.5 hours per day was used for modeling purposes. The annual variable load test for diesel-fired emergency generators has an average load of 50%, and modeled hourly emission rates and release parameters were based on the 50% load.	Emissions modeled accounted for intermittent operation of emergency generators. Only emissions from testing and maintenance are required to be included in the analyses for emergency internal combustion engines. If testing is conducted on a more frequent basis, then the air impact analyses should be modified to reflect this change. NOx emissions from emergency engines were exempted by policy for the 1-hour NO_2 NAAQS compliance demonstrations.
Seasonal Operation of Some Boilers and Cooling Towers. The facility operates 11 natural gas boilers for producing process hot water or steam. Although several of these boilers are only used during winter months, all boilers are assumed to operate at rated conditions throughout the year. Boilers were conservatively assumed to operate 24 hours per day, 365 days per year (8,760 hours). The facility includes nine cooling towers. Emissions for the cooling towers that only operate during the summer are calculated over a six-month period. Also, although two of the four cooling towers associated with Buildings B and C (BCT1, BCT2, CCT1, CCT2) are on standby, they are still included in the potential emissions.	The larger boilers are subject to 40 CFR 60 Subpart Dc, while the small boilers qualify as inconsequential sources. However, all boilers are conservatively assumed to operate throughout the year in calculating potential emissions and in the air dispersion modeling. Similarly, all cooling towers are conservatively included in the PTE calculation. Three cooling towers operating during the summer are assumed to operate 4,380 hours/year. The other six cooling towers are modeled to operate at 8,760 hours/year.
Chi/Q (or *χ/Q*) *TAPs*. The modeled worst-case 24-hr and annual *χ/Q* for process sources was used to determine the concentrations of the process chemical TAPs listed in Tables 10-12 for comparison against AAC and AACC limits listed in IDAPA 58.01.01.585-586. The worst-case 24-hr (0.03879 [mg/m^3]/[lb/hr]) and annual (32.82 [µg/m^3]/[lb/hr]) *χ/Q* from process emissions occurred with stacks DSCRUBF3 and DEXHF8, respectively. These *χ/Q* values must be used by ON Semiconductor to demonstrate future compliance with AACs and AACCs for TAPs. Maximum 24-hour averaged emission rates of Idaho Air Rules	Demonstration of compliance with AACs for TAPs in Idaho Air Rules Section 585 are made on a 24-hour averaging period. Demonstration of compliance with AACCs for TAPs in Idaho Air Rules Section 586 are made on an annual averaging period. Table 19 of this memorandum lists *χ/Q* TAPs ambient impact factors for all point sources used in this permitting project.

Section 585 applicable TAPs must be less than a pound/hour value equal to the following: $$AAC_i\ (in\ mg/m^3)\ \left(\frac{10^3\ \mu g/m^3}{mg/m^3}\right)\left(\frac{1}{\chi/Q}\right)$$ Where: *AACi* = Acceptable Ambient Concentration of TAP "i" in Idaho Air Rules Section 585. *χ/Q* = 585 TAP dispersion factor = ($\mu g/m^3$) / (lb/hr) Maximum annual averaged emission rates of Idaho Air Rules Section 586 TAPs must be less than a pound/hour value equal to the following: $$AACC_i\ (in\ \mu g/m^3)\ \left(\frac{1}{\chi/Q}\right)$$ Where: *AACCi* = Acceptable Ambient Concentration of TAP "i" in Idaho Air Rules Section 586. *χ/Q* = 586 TAP dispersion factor = ($\mu g/m^3$) / (lb/hr)	
Pollution Abatement System. The main pollution abatement systems used at the ON facility are wet and dry scrubbers. Some tools in FABs 9 and 10 have point-of-use abatement systems (POUs) that electrochemically destroy the limited amount of gases left over from the process. POUs are routed to the wet scrubbers. Dry scrubbers are used on the implanter tools exhaust located in each FAB and for gas storage exhaust. All process dry scrubber exhaust is routed to wet scrubbers.	Exhaust streams POUs or dry scrubber units, used for initial control of process emissions in FAB 9 and FAB 10, are routed to wet scrubbers, which provide an additional level of control.
Manufacturing Emissions TAPs Compliance. The hourly emissions rate for the manufacturing process for TAPs compliance was determined by: • Quantifying the actual amount of emissions of each TAP based on the 2007 usage rates supplied by ON. The total baseline emission rate (lb/hr) is calculated based on the sum of each TAP emissions from FAB9, FAB10, and the facility. • For non-carcinogenic TAPs, the historical baseline-actual emissions-based rate was increased by 80% to include the future growth component.	Manufacturing emissions were multiplied by the worst-case χ/Q ambient impact for the appropriate exhaust stack. Compliance with Section 585 TAPs is based on maximum daily modeled impacts. Emissions modeled must be representative of maximum emissions averaged over a period of 24 hours or less to effectively capture short-term ambient impacts.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W – *Guideline on Air Quality Models* (Appendix W). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses demonstrated to the satisfaction of the Department, using DEQ/EPA established guidance, policies, and procedures, that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

1.2 Summary of Submittals and Actions

The permitting history of the ON Semiconductor facility is long (dating back to 1995) and somewhat complicated, with changes in the regulatory approach. Between 2012 and 2017 the project was backlogged because of DEQ staff workload and personnel changes.

August 28, 2012	DEQ received the PTC application and Modeling Report.
September 27, 2012	ON Semiconductor's FEC application was declared complete.
April 5, 2017	DEQ requested additional information to support and revise ON Semiconductor's ambient air impact analyses. DEQ's Stationary Source Air Quality Permitting Program determined that DEQ's modeling staff will rerun the air impact modeling, making any necessary changes to bring the ambient impact analyses in line with the current AERMOD modeling system and methods.
July 11, 2017	ON Semiconductor submitted a response to DEQ's request for additional modeling information.
May 23, 2018	DEQ notified ON Semiconductor about issues with the latest emission inventory.
June 27, 2018	ON Semiconductor submitted a revised emission inventory to DEQ via e-mail.

2.0 Background Information

This section provides background information applicable to the project and the site where the facility is located. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Permit Requirements for Permits to Construct

PTCs are typically issued to authorize the construction of a new source or modification of an existing source or permit. Idaho Air Rules Section 203.02 requires that emissions from the new source or modification not cause or significantly contribute to a violation of any air quality standard, and Idaho Air Rules Section 203.03 requires that emissions from a new source or modification comply with applicable toxic air pollutant (TAP) increments of Idaho Air Rules Sections 585 and 586.

A PTC will be used to establish FEC conditions as described in Idaho Air Rules Sections 175-181. Therefore, Idaho Air Rules Section 203.02 is satisfied through the evaluation of facility-wide emissions of criteria pollutants.

2.2 Project Location and Area Classification

The ON Semiconductor facility is located east of Interstate Highway 15 in the southeastern portion of Pocatello in Bannock County. Terrain rises along the eastern side of the facility. The facility includes ten buildings situated on about 33 acres, and includes offices, chemical storage, support facilities, manufacturing, testing, and common space. The facility is located near UTM (Zone 12) coordinates 384.5 km East and 4,747 km North.

Bannock County is classified as a maintenance area for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). It is designated as attainment or unclassifiable for particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5

micrometers ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb).

ON Semiconductor is considered a minor facility because the potential emissions for all criteria pollutants are less than 100 tons per year. This permit application will not trigger Prevention of Significant Deterioration (PSD) permitting requirements.

2.3 Modeling Applicability for Criteria Pollutants

2.3.1 Below Regulatory Concern and DEQ Modeling Guideline Level I and II Thresholds

Idaho Air Rules Section 203.02 state that a PTC cannot be issued unless the application demonstrates to the satisfaction of DEQ that the new source or modification will not cause or significantly contribute to a NAAQS violation. Atmospheric dispersion modeling is used to evaluate the potential impact of a proposed project to ambient air and demonstrate NAAQS compliance. However, if the emissions associated with a project are very small, project-specific modeling analyses may not be necessary.

If project-wide potential to emit (PTE) values for criteria pollutants would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more criteria pollutants exceeding the BRC threshold of 10% of emissions defined by Idaho Air Rules as significant, then an air impact analysis may not be required for those pollutants. DEQ's regulatory interpretation policy[1] of exemption provisions of Idaho Air Rules Section 221 is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant." The interpretation policy also states that the exemption criteria of uncontrolled PTE not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. This permitting project cannot qualify for a BRC exemption from Idaho Air Rules Section 203.02 because there are existing permit conditions that require changes; however, because facility-wide emissions of some criteria pollutants are below BRC levels, a NAAQS compliance demonstration is not required for those pollutants.

Site-specific air impact analyses may not be required for a project, even when the project cannot use the BRC exemption from the NAAQS demonstration requirements. If the emissions increases associated with a project are below modeling applicability thresholds established in the *Idaho Air Modeling Guideline* ("State of Idaho Guideline for Performing Air Quality Impact Analyses[2]," available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf), then a project-specific analysis is not required. Modeling applicability emissions thresholds were developed by DEQ based on modeling of a hypothetical source and were designed to reasonably ensure that impacts are below the applicable SIL. DEQ has established two threshold levels: Level 1 thresholds are unconditional thresholds, requiring no DEQ approval for use; Level 2 thresholds are conditional upon DEQ approval, which depends on evaluation of the project and the site, including emissions quantities, stack parameters, number of sources emissions are distributed amongst, distance between the sources and the ambient air boundary, and the presence of sensitive receptors near the ambient air boundary.

As shown below in Table 2, non-fugitive facility-wide emissions of PM_{10}, $PM_{2.5}$, CO, and NO_x exceeded the BRC thresholds, and a NAAQS compliance demonstration was required for these

pollutants. NAAQS compliance demonstrations were not required for SO_2, lead, and ozone.
For this FEC permit, the quantity of annual emissions, consisting of the baseline emissions rate (Table 3) plus the rate associated with operational variability and the proposed growth component (Table 4), was compared to BRC levels to evaluate NAAQS compliance demonstration requirement applicability (Table 2). Future modeling of SO_2 and lead will be required if the requested PTE of processes and emissions units installed and operated as part of future changes under the FEC permit exceed any annual BRC thresholds.

Table 2. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY.

Criteria Pollutant	Below Regulatory Concern Level (ton/year)	Applicable Facility-Wide Potential Emissions (ton/year)	NAAQS Compliance Exempted per BRC Policy?
PM_{10}[a]	1.5	17.35	No
$PM_{2.5}$[b]	1.0	3.54	No
Carbon monoxide (CO)	10.0	38.26	No
Sulfur dioxide (SO_2)	4.0	0.27	Yes
Nitrogen oxides (NOx)	4.0	35.23	No
Ozone as VOC or NOx	4.0	35.17 T/yr of VOCs	No[c]

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Ozone modeling applicability is addressed in Section 2.3.2 of this memorandum.

Table 3 shows baseline emissions calculations and Table 4 presents the FEC emissions from the ON facility.

Table 3. BASELINE EMISSIONS CALCULATIONS (IN TPY)[a].

Pollutant	FAB 9[b]	FAB 10[b]	Boilers	Emergency Generators	Cooling Towers	Comfort Heaters	Total Baseline
PM_{10}[c]	--	--	2.94	0.062	12.14	0.08	15.23
$PM_{2.5}$[d]	--	--	2.94	0.060	0.04	0.08	3.12
Carbon monoxide (CO)	--	--	32.52	0.80	--	0.41	33.73
Sulfur dioxide (SO_2)	--	--	0.23	0.002	--	0.01	0.24
Nitrogen oxides (NOx)	--	--	27.93	3.64	--	0.96	32.53
VOCs[e]	5.52	9.56	2.13	0.16	--	0.06	17.43
HAPs[f]	0.98	1.85	0.73	0.01	--	0.02	3.59

a. Tons per year.
b. Fabrication area.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
e. Volatile organic compounds.
f. Hazardous air pollutants.

Table 4. CRITERIA AND HAZARDOUS POLLUTANT FEC (IN TPY)[a].

	PM_{10}[b]	$PM_{2.5}$[c]	CO[d]	SO_2[e]	NOx[f]	VOCs[g]	HAPs[h]
Baseline (From Table 3)	15.23	3.12	33.73	0.24	32.53	17.43	3.59
Operational Variability	--	--	--	--	--	12.02	2.25
Proposed Growth Component	2.12	0.42	4.53	0.03	2.70	5.72	1.12
Facility Emissions Cap (FEC)	17.35	3.54	38.26	0.27	35.23	35.17	6.96

a. Tons per year.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
d. Carbon monoxide.
e. Sulfur dioxide.

[f] Nitrogen oxides.
[g] Volatile organic compounds.
[h] Hazardous air pollutants.

2.3.2 Ozone Modeling Applicability

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NO_x, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

Allowable emission estimates of baseline actual plus the operational variability and future growth components of the facility's requested PTE (which were used to evaluate NAAQS compliance) placed VOCs at 36 tons/year and NOx at 50 tons/year, which are below the 100 tons/year threshold.

2.3.3 Secondary Particulate Formation Modeling Applicability

The impact from secondary particulate formation resulting from emissions of NOx, SO_2, and/or VOCs was assumed by DEQ to be negligible on the basis of the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

2.4 Significant and Cumulative NAAQS Impact Analyses

If maximum modeled pollutant impacts to ambient air from emissions sources associated with a new facility, the emissions increase associated with a modification, or facility-wide allowable emissions for a FEC permit exceed the SILs of Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis may also be required for permit revisions driven by compliance/enforcement actions, any correction of emissions limits or other operational parameters that may affect pollutant impacts to ambient air, or other cases where DEQ believes NAAQS may be threatened by the emissions associated with the facility or proposed project.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts, according to established DEQ/EPA guidance, policies, and procedures, from applicable facility-wide emissions and emissions from any nearby co-contributing sources. A DEQ-approved background concentration value is then added to the modeled result that is appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 5. Table 5 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis.

If the cumulative NAAQS impact analysis shows a violation of the standard, the permit cannot be issued if the proposed project or facility has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. The facility or project does not have a significant contribution to a violation if impacts are below the SIL at all specific receptors showing violations during the time periods when modeled violations occurred.

Table 5. APPLICABLE REGULATORY LIMITS.

Pollutant	Averaging Period	Significant Impact Levels[a] (µg/m³)[b]	Regulatory Limit[c] (µg/m³)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 µg/m³)	75 ppb[p] (196 µg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 µg/m³)	100 ppb[s] (188 µg/m³)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

Table 5. APPLICABLE REGULATORY LIMITS.

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

Compliance with Idaho Air Rules Section 203.02 is demonstrated if: a) specific applicable criteria pollutant emissions increases are at a level defined as Below Regulatory Concern (BRC), using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling applicable emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion. TAPs modeling was required for this project.

3.0 Analytical Methods and Data

3.1 Modeling Methodology

This section describes the modeling methods used by ON Semiconductor and DEQ to demonstrate compliance with applicable air quality standards. ON Semiconductor submitted a modeling report together with the PTC application to DEQ on August 28, 2012. However, the modeling analyses described below refer to DEQ's simulations taking into consideration ON Semiconductor's response to DEQ's request for additional information, dated July 11, 2017, unless stated otherwise.

3.1.1 Overview of Analyses

DEQ performed project-specific air impact analyses that were reasonably representative of the facility, using established DEQ policies, guidance, and procedures. DEQ's analyses demonstrated compliance with applicable air quality standards, provided the ON Semiconductor facility is operated as described in the application and in this memorandum. Table 6 provides a brief description of parameters used in the modeling analyses.

Table 6. MODELING PARAMETERS.

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Pocatello, Idaho	The area is a maintenance area for PM_{10} and an attainment or unclassified area for all other criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 18081.
Meteorological Data	Pocatello	2015-2017 – See Section 3.3 of this memorandum. Surface data from the DEQ site at Garrett and Gould Streets in Pocatello, ID were supplemented with data collected by the National Weather Service (NWS) at Pocatello airport. Upper air soundings were taken from the Boise airport. The data were processed using the latest version of AERMET (version 18081) and the "ADJ_U*" option, in accordance with current EPA modeling guidance.
Terrain	Considered	AERMAP (version 18081) was used to process terrain elevation data for all receptors using USGS 1/3 arc second National Elevation Dataset (NED) files based on the NAD83 datum. For complex terrain situations, AERMOD

		captures the physics of dispersion and creates elevation data for the surrounding terrain identified by a parameter called hill height scale. AERMAP creates hill height scale by searching for the terrain height and location that has the greatest influence on dispersion for each individual source and receptor. Both the base elevation and hill-height scale data are produced for each receptor by AERMAP as a file or files that can be directly accessed by AERMOD. The facility is located within Zone 12.
Building Downwash	Considered	Building influences on stacks are calculated by incorporating the updated EPA Building Profile Input Program for use with the PRIME algorithm (BPIP-PRIME version 04274). Plume downwash was considered for the structures associated with the facility structures.
NOx Chemistry	ARM2	The ARM2 method is a Tier 2 analysis method which assumes an ambient equilibrium between NO and NO_2, in which the conversion of NO to NO_2 is predicted using hourly ambient NOx monitoring data. ARM2 has been adopted by the EPA as a default regulatory Tier 2 option. A minimum and maximum NO_2/NOx ratio of 0.5 and 0.9, respectively, were specified in the model.
Receptor Grid	**SIL Analyses** The selection of receptors for use in the SIL Analyses is as follows:	
	Grid 1	A 15-meter spacing at the facility's ambient air boundary and extending 105 meters from the ambient air boundary.
	Grid 2	A 25-meter grid extending 400 meters from the ambient air boundary.
	Grid 3	A 50-meter grid extending 1,000 meters from the ambient air boundary.
	NAAQS and TAPs Analyses The same receptor grid was used for the NAAQS and TAPs Analyses as for the Significant Impact Level Analyses.	

3.1.2 Modeling Protocol

A modeling protocol was submitted by ON Semiconductor and approved by DEQ prior to the August 2012 PTC submittal. No modeling protocol was submitted after the 2012 PTC application, but ON Semiconductor submitted a response with a much more accurate data on July 11, 2017.

Project-specific modeling was conducted by DEQ using data and methods described in ON's July 2017 response and the *Idaho Air Modeling Guideline*[2]. A list of DEQ updates to the modeling set-up is provided in Section 3.1.4.

3.1.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of Industrial Source Complex Short Term 3 dispersion model (ISCST3), but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 18081 was used by DEQ for the modeling analyses to evaluate impacts of the facility. DEQ determined it was critical that analyses use the current version of the model because FEC permits allow considerable flexibility for reassessing impacts during the duration of the permit.

NO_2 1-hour impacts can be assessed using a tiered approach to account for NO/NO_2/O_3 chemistry. Tier 1 assumes full conversion of NO to NO_2. Tier 2 Ambient Ratio Method (ARM) assumes a 0.80 default ambient ratio of NO_2/NOx. Tier 2 ARM2[3] was recently developed and replaces the previous

ARM. Recent EPA guidance[4] on compliance methods for NO_2 states the following for ARM2:

> "This method is based on an evaluation of the ratios of NO_2/NO_x from the EPA's Air Quality System (AQS) record of ambient air quality data. The ARM2 development report (API, 2013) specifies that ARM2 was developed by binning all the AQS data into bins of 10 ppb increments for NO_x values less than 200 ppb and into bins of 20 ppb for NO_x in the range of 200-600 ppb. From each bin, the 98th percentile NO_2/NO_x ratio was determined and finally, a sixth-order polynomial regression was generated based on the 98th percentile ratios from each bin to obtain the ARM2 equation, which is used to compute a NO_2/NO_x ratio based on the total NO_x levels."

Tier 3 methods account for more refined assessment of the NO to NO_2 conversion, using a supplemental modeling program with AERMOD to better account for $NO/NO_2/O_3$ atmospheric chemistry. Either the Plume Volume Molar Ratio Method (PVMRM) or the Ozone Limiting Method (OLM) can be specified within the AERMOD input file for the Tier 3 approach. EPA guidance (Memorandum: from Tyler Fox, Leader, Air Quality Modeling Group, C439-01, Office of Air Quality Planning and Standards, USEPA; to Regional Air Division Directors. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.* March 01, 2011) has not indicated a preference for one option over the other (PVMRM vs OLM) for applications.

The Tier 2 ARM2 and Tier 3 PVMRM and OLM methods are now regulatory options following the publication of final changes to EPA's Guideline on Air Quality Models on January 17, 2017. DEQ's modeling staff used the Tier 2 ARM2 method with regulatory default minimum and maximum ARM values of 0.5 and 0.9, respectively. ARM2 with the default minimum and maximum ratios is a regulatory default method and is considered reasonably conservative for estimating NO_2 impacts.

The Beta algorithms for treatment of point sources with horizontal release orientation or equipped with a rain cap that impedes the vertical momentum of exhaust plumes were adopted as guideline techniques with the revisions to Appendix W (Guideline on Air Quality Models). The Appendix W final rule was signed by the Administrator on December 2016, and published in the January 17, 2017 in the Federal Register, with a delayed final effective date of May 22, 2017. This method eliminated momentum induced plume rise while still accounting for thermal buoyancy induced plume rise. DEQ applied the algorithms for capped stacks to several of the modeled stacks.

3.1.4 Summary of DEQ's Updates to Model Set-up

As previously noted, DEQ requested for additional information on April 5, 2017, to revise ON Semiconductor's originally submitted ambient air impact analyses. ON responded on July 11, 2017 and submitted a Buildings spreadsheet (2017 Buildings.xls), facility boundary spreadsheet (2017 Plant Boundary.xls), source inputs spreadsheet (Source Input 2017.xls; Sources list Rev 9.xls), and emission inventory (ON Emission Calculations, Rev 7.xls). An updated emission inventory (ON Emission Calculations, Rev 8.xls) was submitted to DEQ via e-mail on June 27, 2018. DEQ's modeling staff used these files to construct the model on BEEST Beeline Software, a graphical user interface for running AERMOD, ISCST3, and ISC-Prime analyses (https://www.beeline-software.com). DEQ is providing the following modeling input files (.dta extension) to ON Semiconductor. ON should use these files as baseline for future simulations:

- PM25_24hr.dta 24-hour $PM_{2.5}$
- PM25_Ann.dta Annual $PM_{2.5}$
- PM10_24hr.dta 24-hour PM_{10}

- NO2_1hr.dta 1-hour NO_2
- NO2_Ann.dta Annual NO_2
- CO_1hr.dta 1-hour CO
- CO_8hr.dta 8-hour CO
- ChiQ_24hr.dta 24-hour χ/Q
- ChiQ_Ann.dta Annual χ/Q

DEQ's modeling staff made the following changes to ON Semiconductor's July 11, 2017 submittal:

- The submitted Buildings spreadsheet and the surveyor's plot lacked four coordinate pairs for Tiers 3 and 5 of Building H; hence the building is inaccurately represented in the model. Accurate representation of building structures is required for downwash algorithms. DEQ identified these coordinates using Google Earth and added these missing coordinates to the model set-up.
- DEQ reconfigured multiple-tier buildings as a tier on top of the underlying structure, rather than as an abutting building with a different height.
- The submitted fenceline coordinates intersect the northwest section of Building B. DEQ adjusted the fenceline such that it now wraps around Building B.
- Covered walkways connecting Buildings D and H are not included in the submitted Buildings spreadsheet. DEQ added these structures to the current model set-up.
- DEQ removed receptors on the covered walkway connecting the ERC Building to the facility because it is exempt from ambient air.
- DEQ updated terrain elevation using the 1/3 arc second National Elevation Dataset (NED).
- Stack temperature of GEXF29 seems unreasonably high. In the model set-up, DEQ changed this value to 100°F, which was determined as reasonably conservative for the source.
- The Emission Inventory contains six heating units in Building B, named BUH_1, BUH_2, BUH_3, BUH_4, BUH_5, and BUH_6, where BUH_6 has zero emissions. The Source Inputs spreadsheet contains five heating units in Building B, named BUH_1, BUH_2, BUH_3, BUH_5, and BUH_6. DEQ modeling staff retained the source IDs of the five heating units listed in the Source Inputs spreadsheet, but used the non-zero emission rates listed in the Emission Inventory (same emission rates for all five heating units).
- For the χ/Q simulations, HSCRUB7F1 and HSCRUB7F2 were renamed to HSCRUBF1 and HSCRUBF2, respectively, because of the 8-character limit when outputting individual stacks on BEEST.

DEQ also notes the following changes to ON Semiconductor's August 28, 2012 modeling report submittal:

- The Ambient Ratio Method (ARM) is no longer an approved method for Tier 2 NO_2 modeling. DEQ requires that the ARM2 method be used instead. ARM2 has been adopted by the EPA as a default regulatory Tier 2 option. It assumes an ambient equilibrium between NO and NO_2, in which the conversion of NO to NO_2 is predicted using hourly ambient NOx monitoring data. DEQ recommends using default in-stack ratios: minimum of 0.5 NO_2/NOx and maximum of 0.9 NO_2/NOx for the 1-hour averaging period. See Table 6 and Section 3.1.3 for more details.
- DEQ recalculated background $PM_{2.5}$ concentrations. These updated values must be used for any cumulative NAAQS impact analyses. See Section 3.2 for more details.
    - 24-hour $PM_{2.5}$ 16 $\mu g/m^3$
    - Annual $PM_{2.5}$ 4.3 $\mu g/m^3$

- DEQ utilized the most recent meteorological dataset available, processed through the most current AERMET processor. DEQ used the latest three-year period (2015-2017) at the monitoring station located at the intersection of Garrett and Gould streets (G&G; latitude: 42.877, longitude: -112.460) in Pocatello, Idaho. This monitoring location is relatively close to the center of Pocatello, and it is located approximately 3.8 km west-north-west of ON Semiconductor. See Section 3.3 for more details.
- DEQ updated the receptor grid as follows. See Table 6 and Section 3.8 for more details.
    - A 15-meter spacing at the facility's ambient air boundary and extending 105 meters from the ambient air boundary.
    - A 25-meter spacing extending 400 meters from the ambient air boundary.
    - A 50-meter spacing extending 1,000 meters from the ambient air boundary
- DEQ calculated the following χ/Q values. See Section 4.3 for results of the χ/Q analyses.
    - 24-hour 0.03879 $(mg/m^3)/(lb/hr)$ Worst-case occurred for Stack DSCRUBF3
    - Annual 32.82 $(\mu g/m^3)/(lb/hr)$ Worse-case occurred for Stack DEXHF8

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS air impact modeling analysis is needed to demonstrate compliance with applicable NAAQS. Background design values (DV) for 24-hour PM_{10}, 1-hour NO_2, annual NO_2 , 1-hour CO, and 8-hour CO were obtained from NW-AIRQUEST (http://lar.wsu.edu/nw-AIRQUEST/lookup.html) using the project site coordinates. These background air pollutant levels are based on regional scale air pollution modeling of pollutants in Washington, Oregon, and Idaho, with modeling results adjusted according to available monitoring data. The values from NW-AIRQUEST are listed in Table 7.

DEQ reevaluated $PM_{2.5}$ concentrations at Pocatello by examining the most robust data recently collected, using monitoring equipment considered as the federal equivalent method (FEM) or as closely to the FEM specifications that currently exist in Idaho DEQ's monitoring network. DEQ calculated 24-hour and annual $PM_{2.5}$ background values of 16 $\mu g/m^3$ and 4.3 $\mu g/m^3$, respectively. DEQ has determined that these estimates for 24-hour and annual background $PM_{2.5}$ are reasonably representative and adequate for the analyses. The DEQ-recommended ambient background values are listed in Table 7.

Table 7. DEQ-RECOMMENDED AMBIENT BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration $(\mu g/m^3)$[a,b]
$PM_{2.5}$[c,d]	24-hr	16
	Annual	4.3
PM_{10}[e]	24-hr	72[f]
NO_2[g]	1-hr	60.1 (32 ppb[h])
	Annual	9.0 (4.8 ppb)
CO[i]	1-hr	3,404 (2,975 ppb)
	8-hr	1,151 (1,006 ppb)

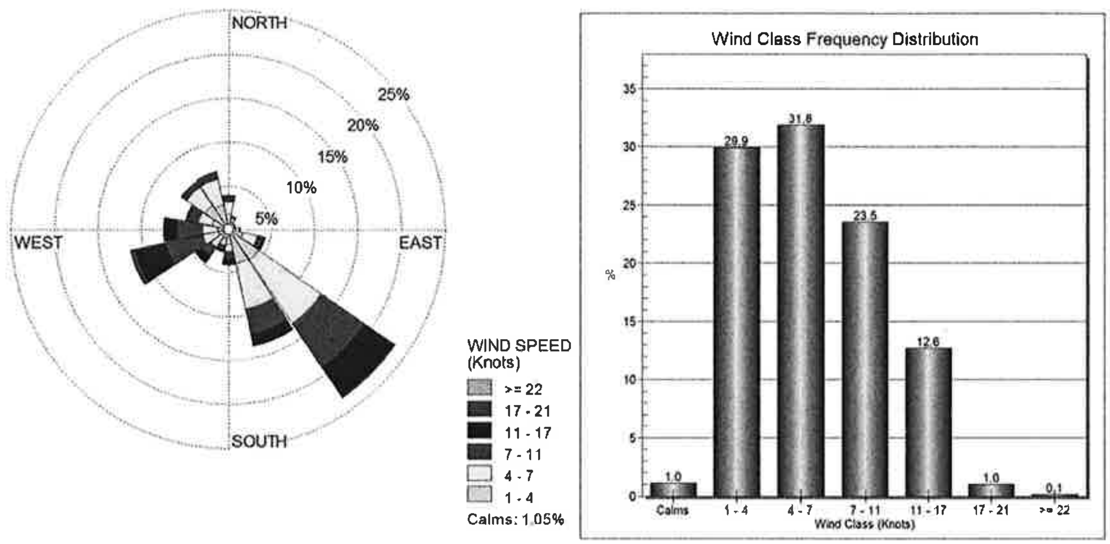
a. Micrograms per cubic meter, except where noted otherwise.
b. NW AIRQUEST ambient background lookup tool, 2009-2011. See http://lar.wsu.edu/nw-airquest/lookup.html, except where noted otherwise.
c. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
d. Data obtained from Garrett & Gould station, 2015-2017.
e. Particulate matter with an aerodynamic diameter of 10 microns or less.
f. Without extreme values.
g. Nitrogen dioxide.
h. Parts per billion by volume.
i. Carbon monoxide.

3.3 Meteorological Data

DEQ processed a model-ready meteorological dataset from Pocatello, Idaho covering the years 2015-2017. Data collected at DEQ's monitoring location at the intersection of Garret and Gould Streets (latitude: 42.877, longitude: -112.460) were used. This monitoring location is relatively close to the center of Pocatello, and it is located approximately 3.8 km west-north-west of ON Semiconductor. The wind speed, wind direction, and surface temperature from the DEQ site were supplemented with cloud cover and ceiling height data collected by the National Weather Service (NWS) at Pocatello airport (Federal Aviation Administration airport code: KIDAI, site ID 725780-24156). The upper air soundings required by AERMET were also taken from the Boise airport station (site ID 24131).

Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Pocatello airport precipitation data. Conditions were determined to be "wet" for 2016 and 2017. The year 2015 was determined to be "average" for precipitation. Average moisture content is defined as within a 30 percentile of the 30-year mean of 11.4 inches. Calms were relatively low at 1%, and less than 1% of the data were missing from the 3-year record. Figure 1 shows a wind rose and wind speed histogram at Pocatello. AERMINUTE version 15272 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 18081 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The "adjust u star" (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. This treatment method was adopted as a regulatory method using NWS surface data.

Figure 1. WIND ROSE AND WIND SPEED HISTOGRAM AT POCATELLO GARRETT & GOULD.

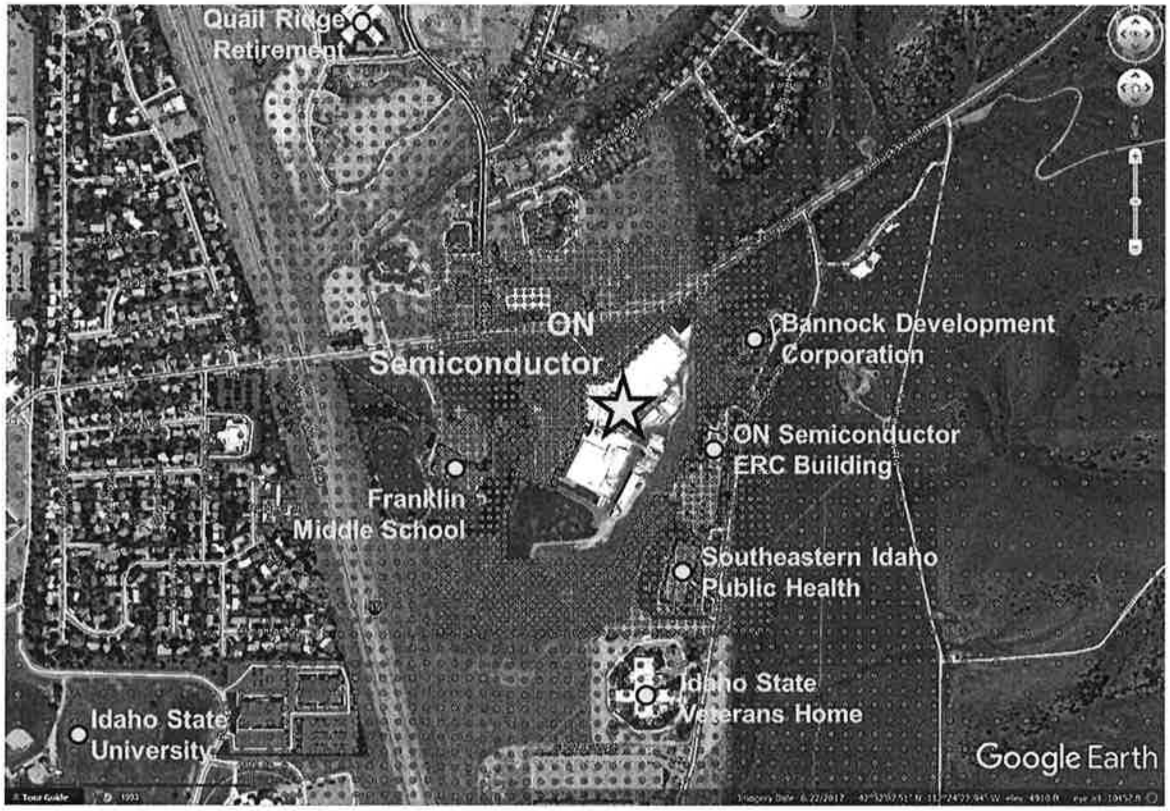


3.4 Terrain Effects

DEQ used a National Elevation Dataset (NED) file, in "tif" format and in the NAD83 datum, to calculate elevations of receptors. A 1/3 arc second file provided 10-meter resolution of elevation data. The terrain preprocessor AERMAP version 18081 was used to extract the elevations from the NED file and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 2 depicts the full receptor grid used in the analyses, overlaid on a terrain image from Google Earth, and Figure 3 shows a close-up of the two innermost grids.

Figure 2. FULL RECEPTOR GRID CENTERED AT THE ON SEMICONDUCTOR FACILITY IN POCATELLO, ID.

Figure 3. THE TWO INNER RECEPTOR GRIDS CENTERED AT THE ON SEMICONDUCTOR FACILITY.



3.5 Building Downwash Effects on Modeled Impacts

Potential downwash effects on the emissions plume were accounted for in the model by using building parameters as described in the submitted application. The Building Profile Input Program for the PRIME downwash algorithm (BPIP-PRIME version 04274) was used to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and release parameters for input to AERMOD.

DEQ review concluded that the building profiles submitted by ON Semiconductor in July 11, 2017 had several inaccuracies (see list on Section 3.1.4). However, DEQ's modeling staff made the necessary changes to represent the facility as accurately as possible in the model. The buildings are now reasonably characterized in the analyses and building downwash is appropriately evaluated.

3.6 Facility Layout

Figures 4 and 5 below show the facility's structures and emissions sources in the modeling analyses. Red dots in Figure 4 represent point sources.

The ambient air boundary was established by ON Semiconductor at the initial line of receptors shown in the figures below. ON Semiconductor hired an independent contractor to collect new building, source, and fenceline coordinates as well as baseline elevations. As noted in Section 3.1.4, DEQ initially found errors that are now resolved. The current model set-up reflects an accurate layout of structures, emissions points, and ambient air boundary.

Figure 4. FACILITY LAYOUT WITH BUILDING STRUCTURES LABELED.

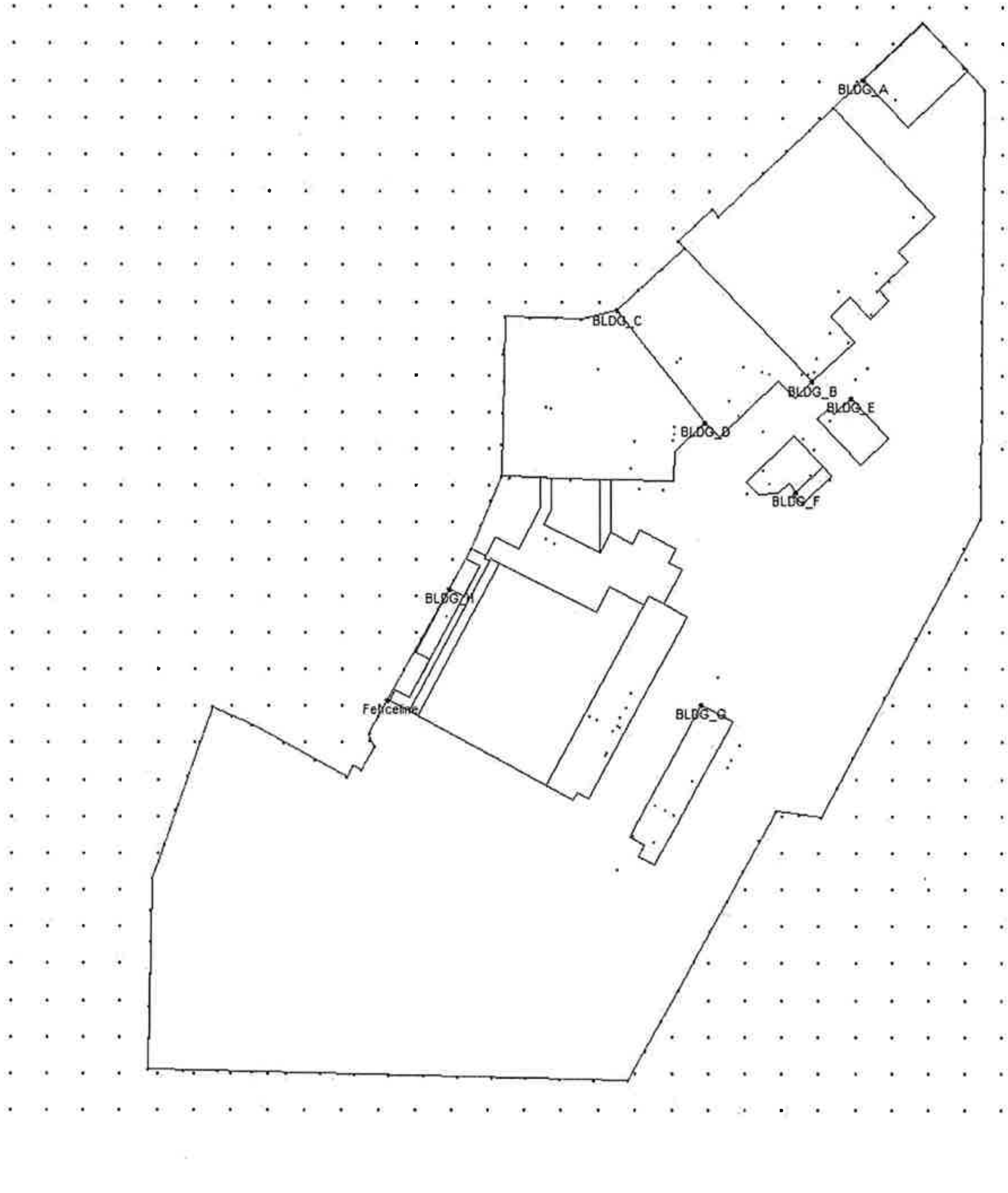
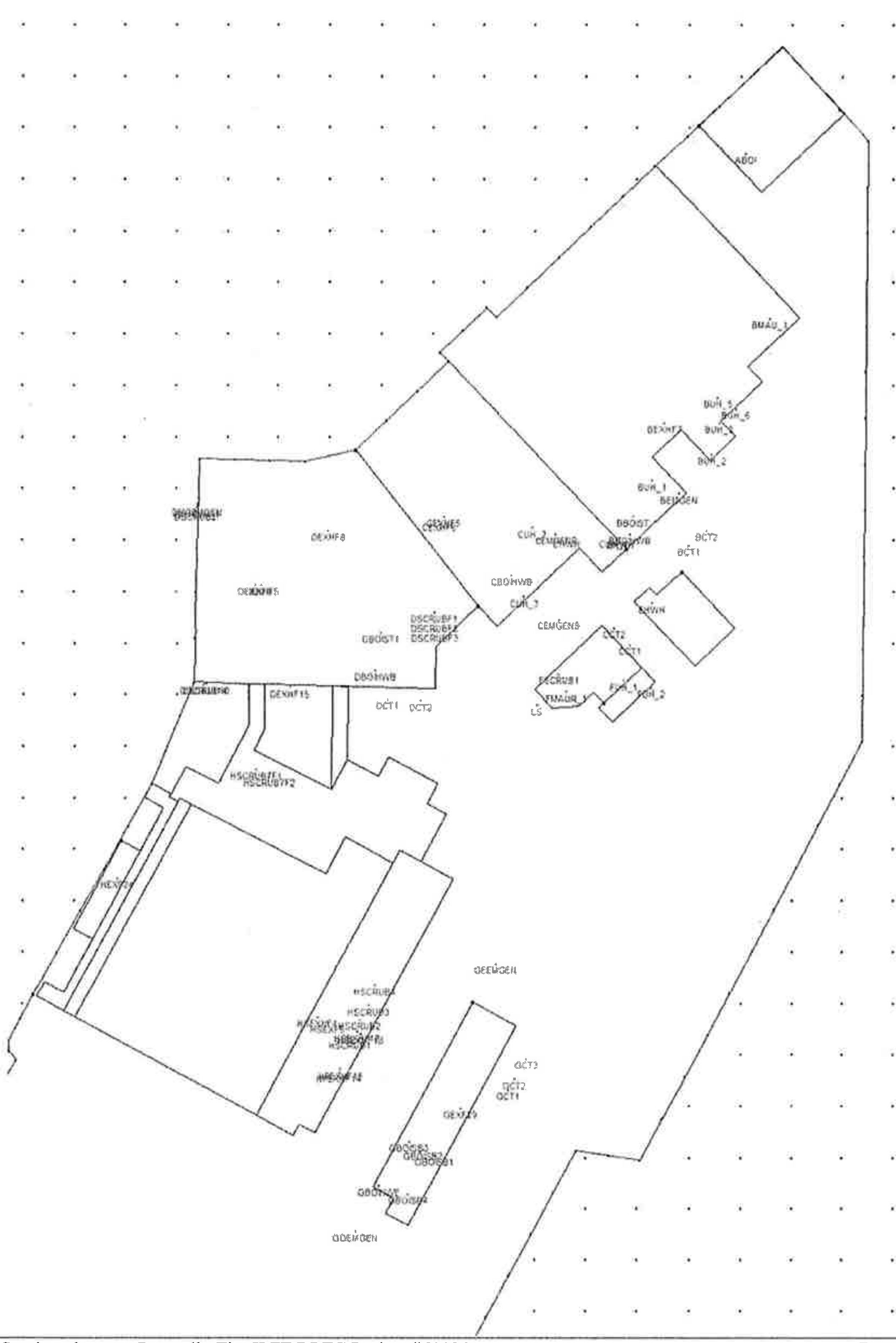


Figure 5. FACILITY LAYOUT WITH EMISSIONS SOURCES LABELED.



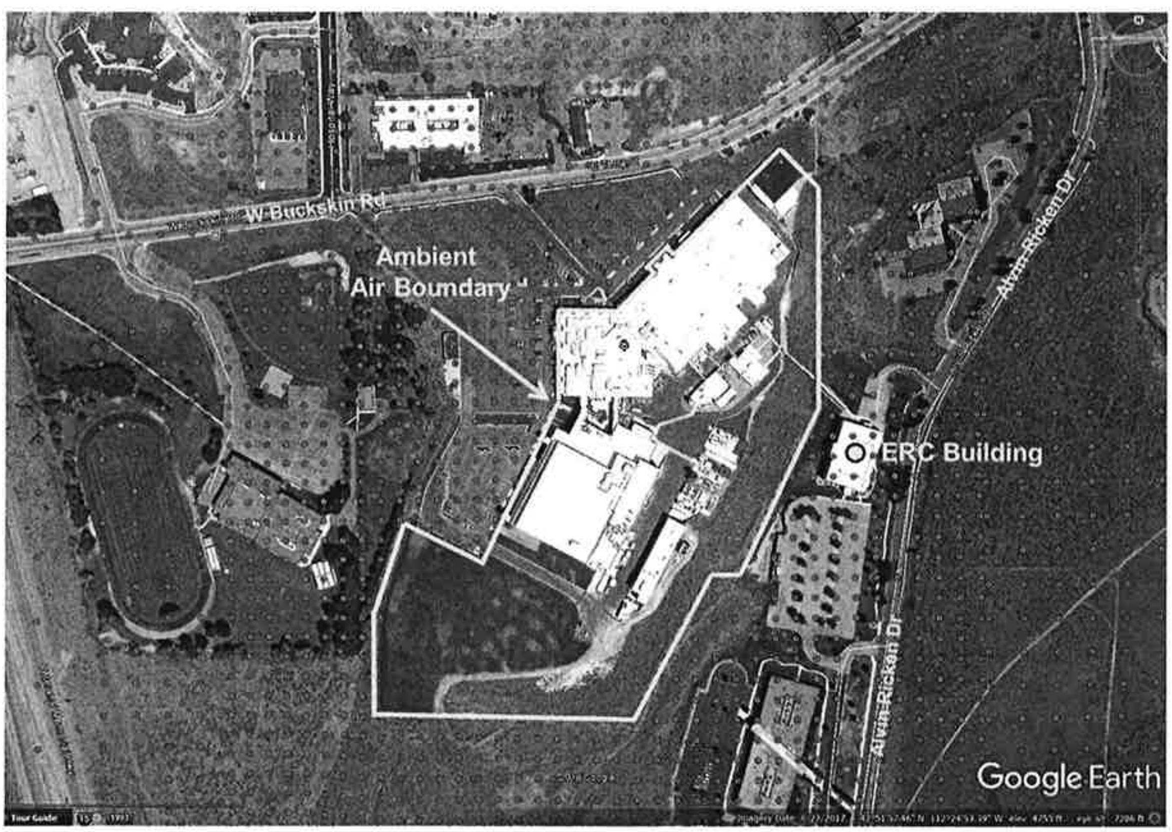
3.7 Ambient Air Boundary

The ambient air boundary for the ON Semiconductor facility in Pocatello is at the facility fenceline, as shown below in Figure 6. General public access to the ON facility is discouraged through the use of "no trespassing" signs, security cameras, and routine security patrols. Fencing is used around the facility to restrict public access, with the exception of parking lot access off of Buckskin Road and Alvin Ricken Drive. The parking lot on Buckskin Road for ON is considered ambient air. There is also a fence separating the ERC Building from the rest of the facility. The covered sidewalk connecting the ERC Building on Alan Rickman Drive to the ON facility has restricted access and does not allow public entrance. This walkway has a locked door on the Alvin Ricken Drive side and access is restricted by employee card readers at both ends. No public-access sidewalks go through the ON facility ambient air boundary.

The general public is not allowed access to the facility as a routine matter of business. Access cards are required to enter all facility buildings and gates. ON does not lease any portion of its facility to another party.

DEQ review concluded that the ambient air boundary employed in the final air impact analyses precluded public access based on the methods described in the modeling report according to the criteria described in DEQ's *Modeling Guideline*[2]. The air impact analyses appropriately addressed air pollutant impacts to areas considered to be ambient air.

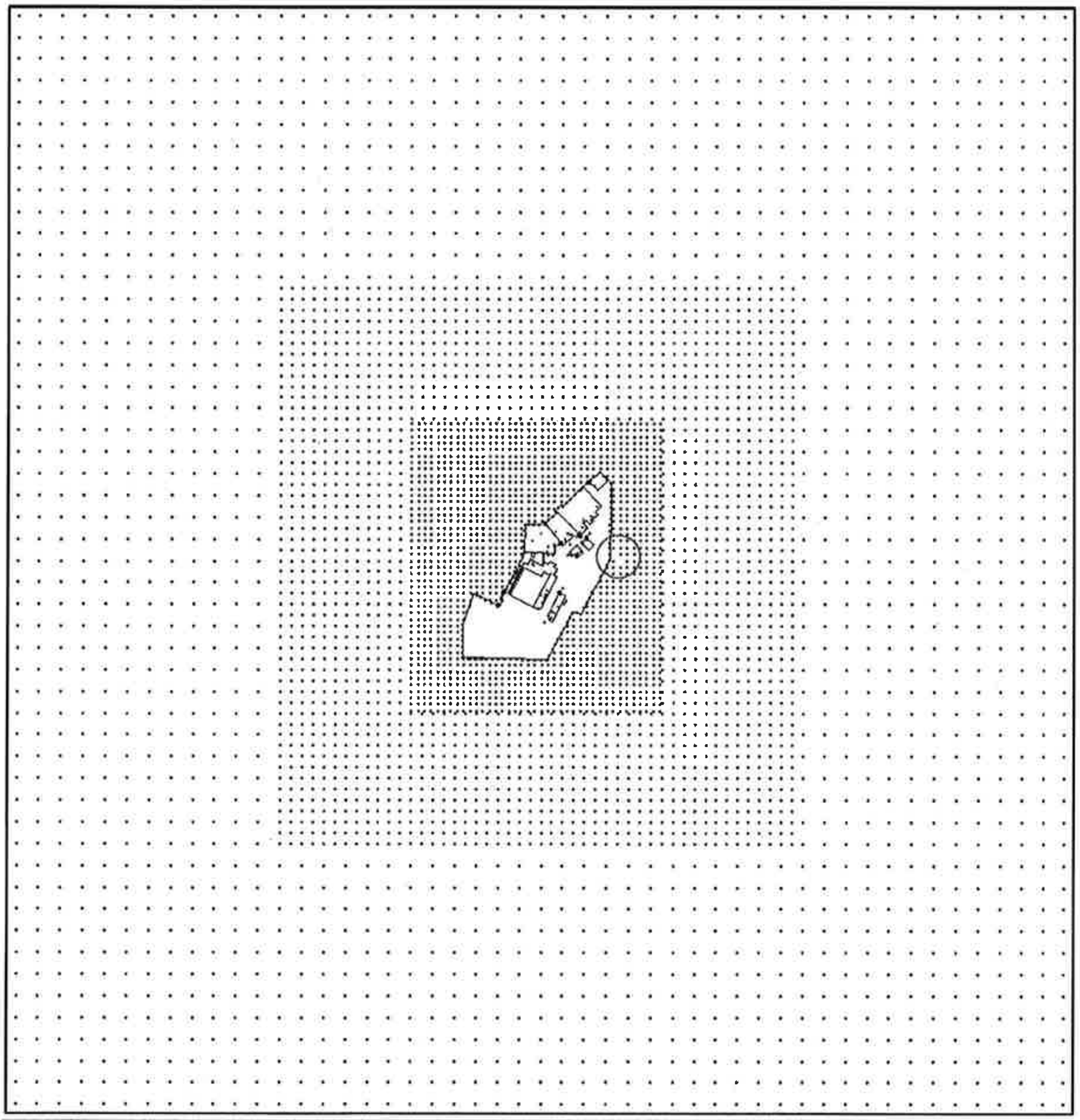
Figure 6. ON SEMICONDUCTOR AMBIENT AIR BOUNDARY.



3.8 Receptor Network

Table 6 describes the receptor network used in the submitted modeling analyses. Discrete receptors were removed to account for the gated and enclosed walkway connecting the ERC building to the facility (highlighted by green circle in Figure 7). The receptor grids used in the model provided good resolution of the maximum design concentrations for the project and provided extensive coverage. The full receptor grid was used for SIL, NAAQS, and TAPs ambient air impact analyses. DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations. The complete extent of the receptor grid is depicted below in Figure 7. The full receptor grid is also depicted in the terrain image in Figure 2.

Figure 7. FULL RECEPTOR GRID.



3.9 Emission Rates

Review and approval of estimated emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling review memorandum. DEQ air impact analyses review included verification that the potential emission rates provided in the emission inventory were properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used for the ON facility in the dispersion modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates. There are three distinct emission inventories that apply to this FEC permit. The first is the SIL and NAAQS analyses, which were based on a PTE estimate by ON Semiconductor and created by adding the baseline actual emissions of the facility to the operational variability component and proposed growth component (Table 4). The operational variability component was intended to provide a measure of operational flexibility for the facility above the baseline actual emissions.

The second inventory is the FEC limit, which is an annual facility-wide emission limit in tons rounded to the nearest integer. The FEC is established at some level greater than the quantity of emissions consisting of baseline actual emissions and operational variability emissions. It is intended to account for future growth. ON Semiconductor requested FEC limits for all criteria pollutants. The FEC permit provides the permittee the option to make future changes that increase emissions of criteria air pollutants.

The third inventory is the TAPs emission inventory. The inventory of applicable TAP emissions seems very conservative. Section 3.9.2 of this memorandum provides more details on modeled TAP emissions.

3.9.1 Criteria Pollutant Emission Rates for Significant Impact Level and Cumulative Analyses

A significant impact level (SIL) analysis was performed by DEQ as part of the air quality compliance demonstration. Cumulative NAAQS analyses were required for all criteria pollutants except SO_2. The emission rates modeled for the SIL analyses for ON Semiconductor's sources were identical to those modeled for the cumulative NAAQS ambient impact analyses.

Table 8 lists criteria pollutant continuous (24 hours per day) emission rates used to evaluate SIL and NAAQS compliance for standards with averaging periods of 24 hours or less. Table 9 lists criteria pollutant continuous (8,760 hours/year) emission rates used to evaluate SIL and NAAQS compliance for standards with an annual averaging period. These modeled rates must be equal to or greater than PTE or permit allowable facility-wide emissions for the listed averaging period. These criteria air pollutant emission rates represent baseline actual emissions, proposed growth, and the level of operational variability above baseline actual emissions for operational flexibility. They are the requested PTE for short- and long-term averaging periods based on the assumptions applied in the ambient impact analyses.

Table 8. ON SEMICONDUCTOR FACILITY EMISSIONS CAP SHORT-TERM CRITERIA POLLUTANT EMISSION RATES.						
Stack ID	Emissions Source	NO_2[a] (lb/hr)[b]	CO[c] (lb/hr)	CO (lb/hr)	$PM_{2.5}$[d] (lb/hr)	PM_{10}[e] (lb/hr)
		1-hr	1-hr	8-hr	24-hr	24-hr
ABOI	Boiler	8.33E-02	7.00E-02	7.00E-02	6.33E-03	6.33E-03
BBOIHWB	Boiler	8.20E-01	6.89E-01	6.89E-01	6.24E-02	6.24E-02
BBOIST	Boiler	7.18E-01	6.03E-01	6.03E-01	5.46E-02	5.46E-02
CBOIHWB	Boiler	8.20E-01	6.89E-01	6.89E-01	6.24E-02	6.24E-02
DBOIHWB	Boiler	8.20E-01	6.89E-01	6.89E-01	6.24E-02	6.24E-02
DBOIST1	Boiler	5.13E-01	4.31E-01	4.31E-01	3.90E-02	3.90E-02
GBOIHWE	Boiler	1.41E-01	1.18E-01	1.18E-01	1.07E-02	1.07E-02
GBOISB1	Boiler	8.20E-01	1.38E+00	1.38E+00	1.25E-01	1.25E-01
GBOISB2	Boiler	8.20E-01	1.38E+00	1.38E+00	1.25E-01	1.25E-01
GBOISB3	Boiler	8.20E-01	1.38E+00	1.38E+00	1.25E-01	1.25E-01
GBOISB4	Boiler	6.15E-01	1.03E+00	1.03E+00	9.35E-02	9.35E-02
BEMGEN	Emergency Generator[f]	0[g]	9.68E-01	1.21E-01	2.10E-04	2.10E-04
CEMGENR	Emergency Generator[f]	0[g]	9.68E-01	1.21E-01	2.10E-04	2.10E-04
CEMGENS	Emergency Generator[f,h]	0[g]	3.01E+00	1.69	6.56E-02	6.76E-02
DEMGEN	Emergency Generator[f]	0[g]	2.28E+00	2.85E-01	4.95E-04	4.95E-04
DMREMGEN	Emergency Generator[f]	0[g]	3.44E+00	4.30E-01	7.92E-04	7.92E-04
GEEMGEN	Emergency Generator[f,h]	0[g]	4.07E+00	2.29	6.25E-02	6.44E-02
GOEMGEN	Emergency Generator[f,h]	0[g]	1.37E+00	7.71E-01	9.03E-02	9.31E-02
FSCRUB1	Waste Water Treatment	0	0	0	1.21E-01	2.12E-01
LS	Lime Silo	0	0	0	4.65E-04	1.79E-03
BCT1	Cooling Tower	0	0	0	7.57E-04	2.34E-01
BCT2	Cooling Tower	0	0	0	7.57E-04	2.34E-01
CCT1	Cooling Tower	0	0	0	6.72E-04	2.08E-01
CCT2	Cooling Tower	0	0	0	6.72E-04	2.08E-01
DCT1	Cooling Tower	0	0	0	2.02E-03	6.25E-01
DCT2	Cooling Tower	0	0	0	2.02E-03	6.25E-01
GCT1	Cooling Tower	0	0	0	2.52E-03	7.81E-01
GCT2	Cooling Tower	0	0	0	1.26E-03	3.91E-01
GCT3	Cooling Tower	0	0	0	1.26E-03	3.91E-01
BHWH	Comfort Heater	7.19E-03	3.06E-03	3.06E-03	5.81E-04	5.81E-04
BUH-1	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-2	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-3	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-5	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BUH-6	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
BMAU-1	Comfort Heater	1.47E-02	6.27E-03	6.27E-03	1.19E-03	1.19E-03
CHWH	Comfort Heater	6.91E-03	2.94E-03	2.94E-03	5.59E-04	5.59E-04
CUH-1	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03
CUH-2	Comfort Heater	2.76E-02	1.18E-02	1.18E-02	2.24E-03	2.24E-03
CUH-3	Comfort Heater	2.76E-02	1.18E-02	1.18E-02	2.24E-03	2.24E-03
GEXF29	Comfort Heater	1.84E-02	7.84E-03	7.84E-03	1.49E-03	1.49E-03
EHWH	Comfort Heater	1.83E-02	7.80E-03	7.80E-03	1.48E-03	1.48E-03
FUH-1	Comfort Heater	1.20E-02	5.10E-03	5.10E-03	9.69E-04	9.69E-04
FUH-2	Comfort Heater	1.20E-02	5.10E-03	5.10E-03	9.69E-04	9.69E-04
FMAUR-1	Comfort Heater	2.84E-02	1.21E-02	1.21E-02	2.29E-03	2.29E-03
GH10UH-1	Comfort Heater	2.30E-02	9.80E-03	9.80E-03	1.86E-03	1.86E-03

a. Nitrogen dioxide.
b. Pounds per hour.
c. Carbon monoxide.
d. Particulate matter with a mean aerodynamic diameter of 2.5 microns or less.
e. Particulate matter with a mean aerodynamic diameter of 10 microns or less.
f. The emergency generators undergo weekly maintenance tests which are conducted for 15-30 minutes. Therefore, they are modeled to emit pollutants for one hour at one-half of the emission rate (i.e., 50 hours/year at half of the emission rate, or equivalently, 100 hours/year at the full emission rate).

g. Emergency electrical generator engines are exempted from 1-hour NO_2 SIL and NAAQS modeling per DEQ policy[5].

h. In a November 26, 2018 e-mail from ON Semiconductor's Teri Bowman to Daniel Pitman, ON indicated that the diesel-fired emergency generators will undergo annual testing according to the following testing schedule: 1 hour at 20% load, 1 hour at 40% load, 1 hour at 60% load, and 1 hour at 80% load. Although only two of the three diesel generators will be tested in one day (4.5 hours per generator per day) and the third on the following day (4.5 hours per day), a worst-case scenario where all three diesel emergency generators operate 4.5 hours per day was used for modeling purposes.

Table 9. ON SEMICONDUCTOR FACILITY EMISSIONS CAP ANNUAL CRITERIA POLLUTANT EMISSION RATES.

Stack ID	Emissions Source	NO_2[a] (lb/hr)[b]	$PM_{2.5}$[c] (lb/hr)
ABOI	Boiler	8.33E-02	6.33E-03
BBOIHWB	Boiler	8.20E-01	6.24E-02
BBOIST	Boiler	7.18E-01	5.46E-02
CBOIHWB	Boiler	8.20E-01	6.24E-02
DBOIHWB	Boiler	8.20E-01	6.24E-02
DBOIST1	Boiler	5.13E-01	3.90E-02
GBOIHWE	Boiler	1.41E-01	1.07E-02
GBOISB1	Boiler	8.20E-01	1.25E-01
GBOISB2	Boiler	8.20E-01	1.25E-01
GBOISB3	Boiler	8.20E-01	1.25E-01
GBOISB4	Boiler	6.15E-01	9.35E-02
BEMGEN	Emergency Generator	6.56E-03	5.76E-05
CEMGENR	Emergency Generator	6.56E-03	5.76E-05
CEMGENS	Emergency Generator	2.73E-01	3.99E-03
DEMGEN	Emergency Generator	1.54E-02	1.36E-04
DMREMGEN	Emergency Generator	2.54E-02	2.17E-04
GEEMGEN	Emergency Generator	3.03E-01	3.81E-03
GOEMGEN	Emergency Generator	2.02E-01	5.50E-03
FSCRUB1	Waste Water Treatment	0	1.03E-03
LS	Lime Silo	0	9.56E-05
BCT1	Cooling Tower	0	7.57E-04
BCT2	Cooling Tower	0	3.78E-04
CCT1	Cooling Tower	0	6.72E-04
CCT2	Cooling Tower	0	3.36E-04
DCT1	Cooling Tower	0	2.02E-03
DCT2	Cooling Tower	0	1.01E-03
GCT1	Cooling Tower	0	2.52E-03
GCT2	Cooling Tower	0	1.26E-03
GCT3	Cooling Tower	0	1.26E-03
BHWH	Comfort Heater	4.73E-03	3.82E-04
BUH-1	Comfort Heater	1.51E-02	1.22E-03
BUH-2	Comfort Heater	1.51E-02	1.22E-03
BUH-3	Comfort Heater	1.51E-02	1.22E-03
BUH-5	Comfort Heater	1.51E-02	1.22E-03
BUH-6	Comfort Heater	1.51E-02	1.22E-03
BMAU-1	Comfort Heater	9.70E-03	7.84E-04
CHWH	Comfort Heater	4.54E-03	3.67E-04
CUH-1	Comfort Heater	1.51E-02	1.22E-03
CUH-2	Comfort Heater	1.82E-02	1.47E-03
CUH-3	Comfort Heater	1.82E-02	1.47E-03
GEXF29	Comfort Heater	1.21E-02	9.80E-04
EHWH	Comfort Heater	1.21E-02	9.75E-04
FUH-1	Comfort Heater	7.88E-03	6.37E-04
FUH-2	Comfort Heater	7.88E-03	6.37E-04
FMAUR-1	Comfort Heater	1.87E-02	1.51E-03
GH10UH-1	Comfort Heater	1.51E-02	1.22E-03

a. Nitrogen oxides.

b. Pounds per hour.
c. Particulate matter with a mean aerodynamic diameter of 2.5 microns or less.

3.9.2 Toxic Air Pollutant Emissions

The increase in emissions from a proposed project is required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact analyses required for any TAP having a requested potential emissions rate that exceeds the screening emissions level (EL) specified by Idaho Air Rules Section 585 or 586. Review of the TAPs emission inventory is the responsibility of the permit writer/project manager. All carcinogenic TAPs emissions from boilers and emergency generators in the ON Semiconductor facility are Hazardous Air Pollutants (HAPs) that are regulated by the National Emission Standards for Hazardous Air Pollutants (NESHAP). Therefore, these carcinogenic TAPs are exempted from modeling. Table 10 lists the 24-hour emission rates for non-carcinogenic TAPs that exceed the EL.

Table 10. NON-CARCINOGENIC TOXIC AIR POLLUTANT 24-HOUR EMISSION RATES.

Toxic Air Pollutants	CAS[a] Number	PTE[b] (lb/hr)[c]	EL[d] (lb/hr)
Hydrogen Chloride	7647-01-0	1.17E-01	5.00E-02
Silicon Dioxide	14808-60-7	1.67E-02	6.70E-03
Phosphoric acid	7664-38-2	3.01E-01	6.70E-02
Hydrogen Peroxide	7722-84-1	5.44E-01	1.00E-01
Sulfuric acid	7664-93-9	1.32E+00	6.70E-02

a. Chemical Abstract Service.
b. PTE = Total baseline (FAB9 + FAB10 + facility) + 80% projected growth.
c. Pounds per hour.
d. Screening emissions level.

In their 2012 PTC application, ON Semiconductor applied a Chi/Q (χ/Q) method of demonstrating compliance with the TAPs increments. The χ/Q method consists of modeling each emissions point with the appropriate release parameters and a 1.0 pound per hour emission rate. The modeled worst case 24-hour and annual χ/Q for process sources were used to determine the concentration of the process chemical TAPs for comparison against AAC and AACC limits listed in IDAPA 58.01.01.585-586.

3.10 Emissions Release Parameters

Tables 11 and 12 list the point source emissions release parameters for modeled sources for the ON Semiconductor facility in metric and English units, respectively.

Table 11. POINT SOURCE EMISSIONS RELEASE PARAMETERS IN METRIC UNITS.

Release Point	Description	UTM[a] Coordinates		Stack Base Elevation (m)	Stack Height (m)	Stack Gas Temp (K)[c]	Stack Flow Velocity (m/s)[d]	Modeled Diameter (m)	Stack Release Type
		Easting (m)[b]	Northing (m)						
ABOI	Boiler – Building A	384,571.23	4,747,072.50	1,441.02	5.72	388.71	5.17	0.457	Raincap
BBOIHWB	Boiler – Building B	384,537.86	4,746,961.63	1,441.08	12.35	388.71	4.19	0.508	Raincap
BBOIST	Boiler	384,538.77	4,746,966.84	1,441.08	14.82	399.82	6.82	0.508	Vertical[e]

Table 11. POINT SOURCE EMISSIONS RELEASE PARAMETERS IN METRIC UNITS.									
Release Point	Description	UTM[a] Coordinates		Stack Base Elevation (m)	Stack Height (m)	Stack Gas Temp (K)[c]	Stack Flow Velocity (m/s)[d]	Modeled Diameter (m)	Stack Release Type
		Easting (m)[b]	Northing (m)						
BCT1	Building B Cooling Tower	384,554.71	4,746,958.23	1,441.16	4.36	291.48	2.75	1.778	Vertical[e]
BCT2	Cooling Tower	384,559.70	4,746,962.67	1,441.16	4.39	291.48	2.75	1.778	Vertical[e]
BEMGEN	Emergency Generator – Building B	384,551.92	4,746,973.52	1,441.08	8.19	894.26	46.00	0.046	Horizontal
BEXHF7	General Exhaust	384,547.85	4,746,994.05	1,441.08	8.39	294.26	2.72	1.270	Vertical[e]
BHWH	Heating Unit	384,535.08	4,746,960.43	1,441.08	8.33	422.04	10.38	0.152	Raincap
BMAU_1	Heating Unit	384,578.49	4,747,024.51	1,441.08	11.31	422.04	1.58	0.559	Raincap
BUH_1	Heating Unit	384,544.27	4,746,977.36	1,441.08	7.99	422.04	74.87	0.102	Raincap
BUH_2	Heating Unit	384,561.41	4,746,984.88	1,441.08	8.07	422.04	18.72	0.203	Raincap
BUH_3	Heating Unit	384,563.61	4,746,994.01	1,441.08	7.74	422.04	11.98	0.254	Raincap
BUH_5	Heating Unit	384,563.19	4,747,001.51	1,441.08	7.74	422.04	47.92	0.127	Raincap
BUH_6	Heating Unit	384,568.49	4,746,998.13	1,441.08	8.27	422.04	7.99	0.152	Raincap
CBOIHWB	Boiler	384,503.18	4,746,949.61	1,441.08	14.48	399.82	5.64	0.559	Vertical[e]
CCT1	Cooling Tower	384,537.84	4,746,929.47	1,441.16	5.09	291.48	1.37	2.540	Vertical[e]
CCT2	Cooling Tower	384,533.19	4,746,934.28	1,441.16	5.16	291.48	1.12	2.540	Vertical[e]
CEMGENR	Emergency Generator	384,516.24	4,746,961.53	1,441.08	8.92	894.26	46.00	0.046	Raincap
CEMGENS	Emergency Generator	384,517.06	4,746,936.86	1,441.05	11.17	716.05	38.97	0.305	Vertical[e]
CEXHF5	Exhaust Fan 5	384,483.05	4,746,966.66	1,441.08	10.92	290.93	5.67	0.813	Vertical[e]
CEXHF6	Exhaust Fan 6	384,481.70	4,746,965.37	1,441.08	10.92	294.54	4.52	0.813	Vertical[e]
CHWH	Heating Unit	384,519.40	4,746,960.52	1,441.08	8.49	422.04	9.98	0.152	Raincap
CUH_1	Heating Unit	384,533.03	4,746,960.60	1,441.08	8.55	422.04	47.92	0.127	Raincap
CUH_2	Heating Unit	384,509.14	4,746,963.54	1,441.08	8.03	422.04	14.38	0.254	Raincap
CUH_3	Heating Unit	384,506.74	4,746,943.36	1,441.08	8.27	422.04	14.38	0.254	Raincap
DBOIHWB	Boiler	384,463.00	4,746,922.04	1,437.49	18.47	380.37	5.54	0.559	Vertical[e]
DBOIST1	Boiler	384,464.53	4,746,933.06	1,437.49	18.46	491.48	8.19	0.406	Vertical[e]
DCT1	Cooling Tower	384,466.68	4,746,913.54	1,440.75	8.65	291.48	0.96	3.353	Vertical[e]
DCT2	Cooling Tower	384,476.33	4,746,913.22	1,440.75	8.67	291.48	0.96	3.353	Vertical[e]
DEXHF15	Fab Exhaust Fan 15	384,438.16	4,746,916.99	1,437.49	12.34	295.04	11.01	0.565	Vertical[e]
DEXHF5	General Exhaust	384,430.13	4,746,946.73	1,437.49	14.06	294.82	3.51	0.759	Vertical[e]
DEXHF6	General Exhaust	384,428.14	4,746,946.76	1,437.49	14.04	294.82	3.71	0.759	Vertical[e]
DEXHF8	Fab Exhaust Fan 8	384,449.52	4,746,962.56	1,437.49	13.81	293.89	3.88	0.305	Vertical[e]
DMREMGEN	Emergency Generator	384,411.10	4,746,969.73	1,437.49	17.25	922.04	24.80	0.084	Vertical[e]
DSCRUB10	Scrubber 10	384,413.44	4,746,918.02	1,437.49	16.08	284.86	6.39	0.508	Vertical[e]
DSCRUB14	Scrubber 14	384,412.78	4,746,917.89	1,437.49	16.47	284.06	6.71	0.406	Vertical[e]
DSCRUB5	Scrubber 5	384,410.60	4,746,968.51	1,437.49	16.99	283.95	3.13	0.914	Vertical[e]
DSCRUBF1	Scrubber 1 & 2	384,480.46	4,746,938.86	1,437.49	16.82	284.27	2.89	1.270	Vertical[e]
DSCRUBF2	Scrubber 1 & 2	384,480.40	4,746,936.11	1,437.49	16.83	284.12	2.89	1.270	Vertical[e]
DSCRUBF3	Scrubber 1 & 2	384,480.30	4,746,933.39	1,437.49	16.84	284.12	2.89	1.270	Vertical[e]
EHWH	Heating Unit	384,544.22	4,746,941.59	1,441.21	8.87	422.04	59.87	0.102	Raincap
FMAUR_1	Heating Unit	384,519.17	4,746,915.72	1,441.02	5.83	422.04	0.97	0.946	Raincap
FSCRUB1	Scrubber 1	384,516.92	4,746,921.03	1,441.02	8.84	283.01	7.33	0.508	Vertical[e]
FUH_1	Heating Unit	384,536.07	4,746,919.08	1,441.02	4.39	422.04	4.33	0.305	Raincap
FUH_2	Heating Unit	384,544.03	4,746,916.93	1,441.02	8.28	422.04	9.73	0.203	Horizontal
GBOIHWE	Boiler	384,464.31	4,746,771.72	1,441.14	10.37	388.71	2.59	0.305	Raincap
GBOISB1	Boiler	384,480.54	4,746,780.55	1,441.14	11.59	449.82	9.43	0.508	Raincap
GBOISB2	Boiler	384,477.29	4,746,782.31	1,441.14	11.70	449.82	9.43	0.508	Raincap
GBOISB3	Boiler	384,473.11	4,746,784.55	1,441.14	11.83	449.82	9.43	0.508	Raincap
GBOISB4	Boiler	384,472.82	4,746,769.21	1,441.14	11.73	449.82	4.19	0.762	Raincap
GCT1	Cooling Tower	384,502.30	4,746,799.63	1,445.97	7.81	291.48	1.24	3.353	Vertical[e]
GCT2	Cooling Tower	384,504.03	4,746,802.86	1,445.97	7.84	291.48	1.24	3.353	Vertical[e]
GCT3	Cooling Tower	384,507.44	4,746,808.83	1,445.97	7.47	291.48	1.24	3.353	Vertical[e]
GEEMGEN	Emergency Generator	384,498.46	4,746,836.47	1,441.28	4.55	754.35	36.04	0.305	Vertical[e]
GEXF29	Heating Unit and Building Exhaust	384,488.21	4,746,794.33	1,441.14	9.56	310.93	5.62	0.791	Raincap
GH10UH_1	Heating Unit	384,411.04	4,746,969.39	1,437.49	17.10	422.04	110.01	0.084	Raincap

Table 11. POINT SOURCE EMISSIONS RELEASE PARAMETERS IN METRIC UNITS.									
Release Point	Description	UTM[a] Coordinates		Stack Base Elevation (m)	Stack Height (m)	Stack Gas Temp (K)[c]	Stack Flow Velocity (m/s)[d]	Modeled Diameter (m)	Stack Release Type
		Easting (m)[b]	Northing (m)						
GOEMGEN	Emergency Generator	384,457.62	4,746,758.22	1,441.01	4.10	281.21	6.84	2.591	Vertical[e]
HEXF24	Fab Exhaust	384,387.54	4,746,861.39	1,434.76	7.03	293.00	2.85	0.700	Vertical[e]
HPEXHF14	Fab Pyro ExF 14	384,452.65	4,746,804.74	1,434.76	23.95	293.00	2.27	0.559	Vertical[e]
HPEXHF15	Fab Pyro ExF 15	384,453.12	4,746,805.60	1,434.76	23.94	293.47	2.30	0.559	Vertical[e]
HSCRUB1	Scrubber 1	384,455.83	4,746,814.60	1,434.76	24.76	285.93	9.19	1.270	Vertical[e]
HSCRUB2	Scrubber 2	384,458.73	4,746,820.01	1,434.76	24.82	285.84	8.39	1.270	Vertical[e]
HSCRUB3	Scrubber 3	384,461.09	4,746,824.31	1,434.76	24.48	285.93	8.92	1.270	Vertical[e]
HSCRUB4	Scrubber 4	384,463.06	4,746,830.19	1,434.76	24.64	285.87	8.88	1.270	Vertical[e]
HSCRUBF1	Scrubber 7	384,428.28	4,746,893.16	1,434.76	19.39	285.23	2.64	0.914	Vertical[e]
HSCRUBF2	Scrubber 7	384,431.98	4,746,891.13	1,434.76	19.40	285.37	2.84	0.914	Vertical[e]
HSEXF5	Fab Solvent ExF 5	384,449.43	4,746,819.23	1,434.76	24.84	293.83	4.52	0.762	Vertical[e]
HSEXHF17	Fab Silane ExF 17	384,457.94	4,746,816.60	1,434.76	23.29	292.52	4.29	0.406	Vertical[e]
HSEXHF18	Fab Silane ExF 18	384,458.88	4,746,816.03	1,434.76	23.29	292.52	4.42	0.406	Vertical[e]
HSEXHF4	Fab Solvent ExF 4	384,446.48	4,746,820.78	1,434.76	24.83	293.44	4.51	0.762	Vertical[e]
LS	Lime Silo	384,510.40	4,746,911.92	1,441.09	12.52	293.15	1.12	0.480	Vertical[e]

a. Universal Transverse Mercator, NAD83 horizontal datum, Zone 12.
b. Meters.
c. Kelvin.
d. Meters per second.
e. Uninterrupted vertical release.

Table 12. POINT SOURCE EMISSIONS RELEASE PARAMETERS IN ENGLISH UNITS.									
Release Point	Description	UTM[a] Coordinates		Stack Base Elevation (ft)[c]	Stack Height (ft)	Stack Gas Temp (°F)[d]	Stack Flow Velocity (ft/s)[e]	Modeled Diameter (ft)	Stack Release Type
		Easting (m)[b]	Northing (m)						
ABOI	Boiler – Building A	384,571.23	4,747,072.50	4,727.76	18.76	240	16.98	1.50	Raincap
BBOIHWB	Boiler – Building B	384,537.86	4,746,961.63	4,727.96	40.52	240	13.75	1.67	Raincap
BBOIST	Boiler	384,538.77	4,746,966.84	4,727.96	48.63	260	22.38	1.67	Vertical[f]
BCT1	Building B Cooling Tower	384,554.71	4,746,958.23	4,728.22	14.30	65	9.02	5.83	Vertical[f]
BCT2	Cooling Tower	384,559.70	4,746,962.67	4,728.22	14.40	65	9.02	5.83	Vertical[f]
BEMGEN	Emergency Generator – Building B	384,551.92	4,746,973.52	4,727.96	26.86	1,150	150.90	0.15	Horizontal
BEXHF7	General Exhaust	384,547.85	4,746,994.05	4,727.96	27.51	70	8.92	4.17	Vertical[f]
BHWH	Heating Unit	384,535.08	4,746,960.43	4,727.96	27.32	300	34.06	0.50	Raincap
BMAU_1	Heating Unit	384,578.49	4,747,024.51	4,727.96	37.09	300	5.20	1.83	Raincap
BUH_1	Heating Unit	384,544.27	4,746,977.36	4,727.96	26.21	300	245.65	0.33	Raincap
BUH_2	Heating Unit	384,561.41	4,746,984.88	4,727.96	26.47	300	61.41	0.67	Raincap
BUH_3	Heating Unit	384,563.61	4,746,994.01	4,727.96	25.41	300	39.30	0.83	Raincap
BUH_5	Heating Unit	384,563.19	4,747,001.51	4,727.96	25.38	300	157.21	0.42	Raincap
BUH_6	Heating Unit	384,568.49	4,746,998.13	4,727.96	27.13	300	26.20	0.50	Raincap
CBOIHWB	Boiler	384,503.18	4,746,949.61	4,727.96	47.52	260	18.50	1.83	Vertical[f]
CCT1	Cooling Tower	384,537.84	4,746,929.47	4,728.23	16.70	65	4.49	8.33	Vertical[f]
CCT2	Cooling Tower	384,533.19	4,746,934.28	4,728.23	16.94	65	3.68	8.33	Vertical[f]
CEMGENR	Emergency Generator	384,516.24	4,746,961.53	4,727.96	29.26	1,150	150.90	0.15	Raincap
CEMGENS	Emergency Generator	384,517.06	4,746,936.86	4,727.84	36.65	829	127.85	1.00	Vertical[f]
CEXHF5	Exhaust Fan 5	384,483.05	4,746,966.66	4,727.96	35.84	64	18.60	2.67	Vertical[f]
CEXHF6	Exhaust Fan 6	384,481.70	4,746,965.37	4,727.96	35.84	71	14.82	2.67	Vertical[f]
CHWH	Heating Unit	384,519.40	4,746,960.52	4,727.96	27.84	300	32.75	0.50	Raincap
CUH_1	Heating Unit	384,533.03	4,746,960.60	4,727.96	28.04	300	157.21	0.42	Raincap
CUH_2	Heating Unit	384,509.14	4,746,963.54	4,727.96	26.36	300	47.16	0.83	Raincap
CUH_3	Heating Unit	384,506.74	4,746,943.36	4,727.96	27.12	300	47.16	0.83	Raincap
DBOIHWB	Boiler	384,463.00	4,746,922.04	4,716.18	60.59	225	18.18	1.83	Vertical[f]
DBOIST1	Boiler	384,464.53	4,746,933.06	4,716.18	60.57	425	26.86	1.33	Vertical[f]

Table 12. POINT SOURCE EMISSIONS RELEASE PARAMETERS IN ENGLISH UNITS.									
Release Point	Description	UTM[a] Coordinates		Stack Base Elevation (ft)[c]	Stack Height (ft)	Stack Gas Temp (°F)[d]	Stack Flow Velocity (ft/s)[e]	Modeled Diameter (ft)	Stack Release Type
		Easting (m)[b]	Northing (m)						
DCT1	Cooling Tower	384,466.68	4,746,913.54	4,726.87	28.37	65	3.15	11.00	Vertical[f]
DCT2	Cooling Tower	384,476.33	4,746,913.22	4,726.87	28.45	65	3.15	11.00	Vertical[f]
DEXHF15	Fab Exhaust Fan 15	384,438.16	4,746,916.99	4,716.18	40.50	71	36.12	1.85	Vertical[f]
DEXHF5	General Exhaust	384,430.13	4,746,946.73	4,716.18	46.12	71	11.53	2.49	Vertical[f]
DEXHF6	General Exhaust	384,428.14	4,746,946.76	4,716.18	46.06	71	12.16	2.49	Vertical[f]
DEXHF8	Fab Exhaust Fan 8	384,449.52	4,746,962.56	4,716.18	45.31	69	12.73	1.00	Vertical[f]
DMREMGEN	Emergency Generator	384,411.10	4,746,969.73	4,716.18	56.58	1,200	81.37	0.27	Vertical[f]
DSCRUB10	Scrubber 10	384,413.44	4,746,918.02	4,716.18	52.77	53	20.95	1.67	Vertical[f]
DSCRUB14	Scrubber 14	384,412.78	4,746,917.89	4,716.18	54.03	52	22.02	1.33	Vertical[f]
DSCRUB5	Scrubber 5	384,410.60	4,746,968.51	4,716.18	55.74	51	10.27	3.00	Vertical[f]
DSCRUBF1	Scrubber 1 & 2	384,480.46	4,746,938.86	4,716.18	55.19	52	9.48	4.17	Vertical[f]
DSCRUBF2	Scrubber 1 & 2	384,480.40	4,746,936.11	4,716.18	55.23	52	9.48	4.17	Vertical[f]
DSCRUBF3	Scrubber 1 & 2	384,480.30	4,746,933.39	4,716.18	55.24	52	9.48	4.17	Vertical[f]
EHWH	Heating Unit	384,544.22	4,746,941.59	4,728.37	29.10	300	196.41	0.33	Raincap
FMAUR_1	Heating Unit	384,519.17	4,746,915.72	4,727.76	19.13	300	3.17	3.11	Raincap
FSCRUB1	Scrubber 1	384,516.92	4,746,921.03	4,727.76	29.00	50	24.06	1.67	Vertical[f]
FUH_1	Heating Unit	384,536.07	4,746,919.08	4,727.76	14.39	300	14.19	1.00	Raincap
FUH_2	Heating Unit	384,544.03	4,746,916.93	4,727.76	27.16	300	31.93	0.67	Horizontal
GBOIHWE	Boiler	384,464.31	4,746,771.72	4,728.14	34.01	240	8.49	1.00	Raincap
GBOISB1	Boiler	384,480.54	4,746,780.55	4,728.14	38.01	350	30.94	1.67	Raincap
GBOISB2	Boiler	384,477.29	4,746,782.31	4,728.14	38.39	350	30.94	1.67	Raincap
GBOISB3	Boiler	384,473.11	4,746,784.55	4,728.14	38.82	350	30.94	1.67	Raincap
GBOISB4	Boiler	384,472.82	4,746,769.21	4,728.14	38.49	350	13.75	2.50	Raincap
GCT1	Cooling Tower	384,502.30	4,746,799.63	4,744.01	25.63	65	4.07	11.00	Vertical[f]
GCT2	Cooling Tower	384,504.03	4,746,802.86	4,744.01	25.72	65	4.07	11.00	Vertical[f]
GCT3	Cooling Tower	384,507.44	4,746,808.83	4,744.01	24.52	65	4.07	11.00	Vertical[f]
GEEMGEN	Emergency Generator	384,498.46	4,746,836.47	4,728.60	14.93	898	118.26	1.00	Vertical[f]
GEXF29	Heating Unit and Building Exhaust	384,488.21	4,746,794.33	4,728.14	31.37	100	18.43	2.59	Raincap
GH10UH_1	Heating Unit	384,411.04	4,746,969.39	4,716.18	56.09	300	360.91	0.27	Raincap
GOEMGEN	Emergency Generator	384,457.62	4,746,758.22	4,727.72	13.45	47	22.44	8.50	Vertical[f]
HEXF24	Fab Exhaust	384,387.54	4,746,861.39	4,707.22	23.05	68	9.36	2.30	Vertical[f]
HPEXHF14	Fab Pyro ExF 14	384,452.65	4,746,804.74	4,707.22	78.57	68	7.44	1.83	Vertical[f]
HPEXHF15	Fab Pyro ExF 15	384,453.12	4,746,805.60	4,707.22	78.53	69	7.53	1.83	Vertical[f]
HSCRUB1	Scrubber 1	384,455.83	4,746,814.60	4,707.22	81.24	55	30.15	4.17	Vertical[f]
HSCRUB2	Scrubber 2	384,458.73	4,746,820.01	4,707.22	81.44	55	27.53	4.17	Vertical[f]
HSCRUB3	Scrubber 3	384,461.09	4,746,824.31	4,707.22	80.31	55	29.27	4.17	Vertical[f]
HSCRUB4	Scrubber 4	384,463.06	4,746,830.19	4,707.22	80.85	55	29.12	4.17	Vertical[f]
HSCRUBF1	Scrubber 7	384,428.28	4,746,893.16	4,707.22	63.62	54	8.68	3.00	Vertical[f]
HSCRUBF2	Scrubber 7	384,431.98	4,746,891.13	4,707.22	63.64	54	9.31	3.00	Vertical[f]
HSEXF5	Fab Solvent ExF 5	384,449.43	4,746,819.23	4,707.22	81.48	69	14.84	2.50	Vertical[f]
HSEXHF17	Fab Silane ExF 17	384,457.94	4,746,816.60	4,707.22	76.40	67	14.07	1.33	Vertical[f]
HSEXHF18	Fab Silane ExF 18	384,458.88	4,746,816.03	4,707.22	76.40	67	14.49	1.33	Vertical[f]
HSEXHF4	Fab Solvent ExF 4	384,446.48	4,746,820.78	4,707.22	81.46	69	14.79	2.50	Vertical[f]
LS	Lime Silo	384,510.40	4,746,911.92	4,727.99	41.08	68	3.67	1.57	Vertical[f]

a. Universal Transverse Mercator, NAD83 horizontal datum, Zone 12.
b. Meters.
c. Feet.
d. Degrees Fahrenheit.
e. Feet per second.
f. Uninterrupted vertical release orientation.

DEQ's permitting policies and guidance require that each permit application have stand-alone documentation to support the appropriateness of release parameters used in the air impact analyses. ON Semiconductor's modeling report provided appropriate justification and documentation of assumptions and data supporting key release parameters used to model these point sources. ON Semiconductor submitted additional documentation regarding point source release parameters in a July 11, 2017 submittal. ON Semiconductor affirmed that the release parameters presented in this submittal are correct and accurate. Site surveys of stack locations on building roofs and stand-alone sources not located on rooftops were performed using global positioning system. A professional land surveyor, registered with the State of Idaho, certified the documentation presented in the July 11, 2017 submittal. Location coordinates, base elevations, stack diameter, release height, and release orientation parameters were presented in the documentation. Where a stack was located on a building roof, the stack base elevation at rooftop level and the height at the stack termination were established by the on-site survey, which provides important stack height versus building tier height information used in the AERMOD model to estimate building-induced downwash effects. DEQ revised the modeling analyses using this information and agrees these parameters were adequately supported for all modeled emissions units.

Comfort Heaters and Hot Water Heaters

Model IDs: BHWH, BUH-1, BUH-2, BUH-3, BUH-5, BUH-6, BMAU-1, CHWH, CUH-1, CUH-2, CUH-3, EHWH, FUH-1, FUH-2, FMAUR-1, and GH10UH-1

Small natural gas-fired heating units were modeled as individual point sources. Heat input capacities ranged from 60,000 Btu/hr to 308,000 Btu/hr (or 0.308 MMBtu/hr). Individual stack release heights and exit diameters were supplied by ON Semiconductor, and verified during on-site surveys as described in the July 11, 2017 submittal. Exhaust flow rates in combination with the exit diameter determine the exit velocity of the exhaust plume. A DEQ combustion evaluation spreadsheet was used to estimate each emissions unit's volumetric flow rate of exhaust generated by combusting natural gas with 20% excess air. The flow rates were converted to the assumed 300°F exit temperature for all units. DEQ asserts that these assumptions are reasonably conservative for the air impact analyses. Fifteen emissions points were modeled as capped sources, minimizing the buoyancy effects of the plume's velocity. One point source was modeled as a horizontal release. DEQ agrees these methods were appropriate in establishing release parameters for the comfort heating units and hot water heaters.

Natural Gas-fired Boilers

Model IDs: BBOIST, CBOIHWB, DBOIHWB, and DBOIST1

The boilers included in ON Semiconductor's on-site survey of temperature and flow rate measurement using the ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.) Method 111 were limited to four of the facility's eleven boilers (Table 13). These four boilers have exhaust stacks with uninterrupted vertical releases, and the flow measurement was performed on uncapped sources only. Modeled flow rates and exit temperatures matched the measured values. Load conditions under which each boiler was operating during the field measuring event were not recorded. Exit temperature and volumetric flow rate increase with increased load, so if any of the sources were operating below maximum rated capacity, the modeled values may be underestimated.

Stack locations, release heights, and exit diameters were determined by on-site verification. Modeled values for Boiler BBOIST were unclear given support documentation spreadsheet entries, but the modeled exit temperature is considered an accurate or conservative value for a modern boiler and the modeled stack exit diameter and flow rate produced a 6.8 m/s exit velocity, which is within the expected range for the source.

Table 13. MODELED EXIT TEMPERATURES AND FLOW RATES VERSUS MEASURED VALUES.					
Emissions Unit ID/ Stack ID	**Modeled Exit Temperature (°F)[a]**	**Measured Exit Temperature (°F)**	**Modeled Volumetric Flow Rate (ACFM)[b]**	**Measured Flow Rate (ACFM)**	**Stack Release Orientation**
BBOIST	260	295[c]	2,930	3,300[c]	Vertical
CBOIHWB	260	260	2,930	2,930	Vertical
DBOIHWB	225	225	2,880	2,880	Vertical
DBOIST1	425	425	2,250	2,250	Vertical

a. Degrees Fahrenheit.
b. Actual cubic feet per minute.
c. This is the documented average value presented in the application's ASHRAE Method 111 field survey spreadsheet that is supposed to represent the recommended modeling release parameters. A single data entry for the year 2017 was presented in the support documentation spreadsheet "Sources list Rev 9.xls" with 325°F and 2,250 ACFM flow rate.

Model IDs: ABOI, BBOIHWB, GBOIHWE, GBOISB1, GBOISB2, GBOISB3, and GBOISB4

On-site field surveys provided stack release heights and exit diameters and documented the presence of a rain cap, which impedes exhaust flow. Each of these stacks is equipped with a rain cap. The effect on plume dispersion by the modeled exhaust flow rates for these boilers is minimized so accurate flow rates are not as important for these sources. DEQ compared the modeled exhaust flow rates to EPA F-factor-derived flow rates. DEQ based the F-Factor exhaust flow on rated heat input capacity and the EPA standard exhaust factor, and then corrected the flow rate to modeled exit temperature and the site elevation in Pocatello. DEQ found the modeled flow rates nearly matched the F-Factor estimated flow rates.

DEQ determined that the modeled stack parameters for these boilers were appropriate for the modeling analyses.

Lime Silo

Model ID: LS

The lime silo is equipped with a baghouse. This source emits particulate matter only during the silo loading operation when a truck delivers lime via a pneumatic conveyance system. ON Semiconductor uses a mechanical, not a pneumatic, system to transfer lime from the silo to the wastewater treatment plant.

ON Semiconductor provided a calculated flow rate of 460 actual cubic feet per minute (ACFM) based on the delivery truck flow rate, baghouse backpressure, and the atmospheric pressure at Pocatello's elevation. Stack release height and exit diameter were determined by ON Semiconductor by a field survey.

The exit gas temperature was modeled at 68°F and the support documentation listed the exit temperature as "ambient temperature." The modeled temperature is conservative for some periods but not others, and DEQ determined this assumption is adequate for the analyses.

DEQ determined the lime silo release parameters were adequately justified and supported.

Natural Gas-fired Emergency Generator Engines

Model IDs: BEMGEN, CEMGENR, and DMREMGEN

These emergency generators are small emergency electrical generator engines that are fired on natural gas and are rated at 34 brake horsepower. They operate intermittently for testing and maintenance purposes. ON Semiconductor supported the release temperatures and exhaust flow rates in the permit application for the BEMGEN and CEMGENR engines with a statement that the flow rates are based on vendor (manufacturer) data for a 100% load condition. The specification sheets were not submitted in the permit application. BEMGEN was modeled with a horizontal release orientation and an exhaust flow rate of 160 ACFM, providing an exhaust velocity of 46 m/s with the modeled 1.8-inch diameter stack, which is not an unreasonably high exit velocity for an internal combustion engine operating at full load. An exit temperature of 1,150°F was obtained by ON Semiconductor specification information for the full load operating condition. DEQ was not able to confirm the temperature value of 1,150°F from specification sheets for units BEMGEN and CEMGENR, but based on documentation found by DEQ for natural gas generator engine source DMREMGEN this temperature is accepted as submitted. Emergency engine CEMGENR was modeled with a capped stack and exit velocity is minimized using the AERMOD capped release setting.

DMREMGEN is a 126 brake horsepower (bhp) Kohler natural gas-fired engine. The model number 60RZ72 indicates it is a 60 kW unit. DEQ obtained a Kohler manufacturer's specification sheet for a Model 60RCL unit online and noted the modeled 1,200°F release temperature matched the listed exhaust temperature value. The documentation did not provide details on whether this was an exhaust manifold temperature or an exhaust stack temperature. This stack was modeled with an uninterrupted vertical release and an exhaust flow rate of 290 ACFM. ON Semiconductor's 2017 documentation stated that the 290 ACFM value was calculated for 50% load using the ideal gas law. Kohler's Model 60RCL specification sheet listed 580 ACFM for 60 Hz operation, so the modeled flow rate is adequately justified. This specification sheet provides adequate support documentation that the CEMGENR and BEMGEN exit temperatures are appropriate.

Diesel-fired Emergency Generator Engines

Model IDs: CEMGENS, GOEEMGEN, and GEEMGEN

ON Semiconductor submitted manufacturer's specification sheets for all three of the diesel-fired emergency generator engines.

Engine Model ID CEMGENS is a Caterpillar model 3512 which produces 1,250 kW at full load and is rated at 1,818 bhp. Exhaust manifold temperatures and exhaust stack temperatures are both provided with the stack temperature 280°F lower than the manifold temperature at a value of 1,007°F. At full load the exhaust flow rate is listed as 10,799 ACFM. This emergency engine was modeled at worst-case half load conditions for flow rate and exit temperature. The modeled values of 6,025 ACFM and 829°F were identical to the specification sheet. A stack diameter was not listed on the specification sheet. ON Semiconductor modeled a 12-inch diameter stack and noted that an actual stack diameter of 10 inches was increased to 12 inches to reduce the exit velocity, which was 39 meters per second (m/s) at the ½ load condition. Exit velocity using the 12-inch stack diameter and full load flow rate would be 70 m/s. The modeled increase in release diameter was intended to apply a more conservative approach to modeling the source in reducing the exhaust's exit velocity to below the 50 m/s threshold where DEQ requests additional justification be submitted by the permittee. DEQ noted that 12-inch diameter value was listed in the July 11, 2017 site survey documentation, which was understood to be a full field survey. DEQ recognizes that ON Semiconductor applied conservative assumptions for the exit diameter and the exhaust flow rate for a source that is modeled at full load emission rates using half load release parameters.

Engine Model ID GEEMGEN is a Caterpillar 3512 diesel-fired engine quite similar to the CEMGEMS engine described above. The specification sheet's 50% load exit temperature and exhaust flow rate were used to model the source, with the values of 898°F and 5,572 ACFM, respectively. The unit was modeled with a single 12-inch diameter stack, which ON Semiconductor's 2012 release parameter support documentation indicates is actually a 10-inch diameter stack. These parameters provide a 36 m/s exist velocity which is well below the 50 m/s additional substantiation threshold. DEQ determined these values are adequately conservative for the analyses.

Engine Model ID GOEEMGEN is a Caterpillar engine. The specification sheet submitted by ON Semiconductor shows the engine produces 2,593 bhp and 1,825 kW at full load. This source was modeled with unique release parameters. The release point is a large exhaust vent on the housing for the generator and engine with an effective diameter of 8.5 feet based on a measured cross-sectional area of 57 feet. This large emergency engine's cooling fan flow of 68,000 ACFM is combined with the exhaust gas flow of the unit. The specification sheet's flow for half load operation of 8,740 ACFM plus the 68,000 ACFM confirmed by an equipment vendor, for a total flow rate of 76,400 ACFM. The exit temperature was conservatively assumed to be equal to the average air temperature in Pocatello for a value of 46.5°F. This is an unusual arrangement for an emergency engine release point and DEQ agrees that ON Semiconductor's is appropriate for the modeling demonstration.

Scrubber Units and Manufacturing Process Exhaust Vents

There are thirteen scrubber units at the facility (Table 14). One scrubber unit, model ID DSCRUB3, was identified as a standby unit, and monitored exit temperature and flow rate information were not presented for this emissions point. ON Semiconductor conducted field surveys using a hand-held monitor to record the exhaust velocity for uncapped stacks using American Society for Air Conditioning and Refrigeration Engineering (ASHRAE) Method 111 methods. Stack exit temperatures were also monitored. ON Semiconductor noted that the actual physical logs for the onsite measurement were not retained. Frequency of monitoring beyond single annual values is not discussed and the operating condition of monitoring for each emissions point's sources or ventilation equipment was not noted. Flow rate and exit temperatures justification and support is limited to the electronic spreadsheet titled "Sources list Rev 9.xls" under the tab titled "ASHRAE." Monitoring information was presented for a number of sources for every year starting in 2010 and ending in 2017, while only a single year or two or three years data was provided for some sources. An average of the listed values of all years where data existed was used to establish the modeling input value for these air impact analyses.

The values for exit temperatures were very consistent from year to year, but the values for the exhaust volumetric flow rates for the scrubbers often varied greatly between maximum and minimum values. Modeled flow rates and exit temperatures matched the average values presented in ON Semiconductor's release parameter justification materials. DEQ determined that release parameters for the scrubber point sources were adequately supported and the multiple-year field verifications provided values for the air impact analyses that were conservatively below the maximum design flow rates. All scrubber units exhaust with an uninterrupted vertical release.

Table 14. SCRUBBER EXIT TEMPERATURES AND EXHAUST FLOW RATES.					
Source ID	**Source Description**	**Exit Temperature (°F)[a]**	**Exhaust Flow Rate (ACFM)[b]**	**Range of Flow Rates (ACFM)**	**Basis of Modeled Values**
DSCRUB10	Building D Scrubber 10	53.1	2,743	1,200 to 6,500	7 year average of temperature and flow rate
DSCRUB14	Building D Scrubber 14	51.6	1,845	700 to 2,300	5 year average of temperature and flow rate
DSCRUB5	Building D Scrubber 5	51.4	4,357	1200 to 11,000	7 year average of temperature and flow rate
DSCRUBF1	Building D Scrubber 1 & 2	52.0	7,757	3,200 to 30,000	7 year average of temperature and flow rate
DSCRUBF2	Building D Scrubber 1 & 2	51.7	7,757	3,200 to 30,000	7 year average of temperature and flow rate
DSCRUBF3	Building D Scrubber 1 & 2	51.7	7,757	listed as a standby scrubber -- release parameters values match the other identical scrubbers DSCRUBF1 and DSCRUBF2	Same as DSCRUBF1 and DSCRUBF2
FSCRUB1	Building F Scrubber 1	49.7	3,150	3,000 to 3,200	4 year average of temperature and flow rate
HSCRUB1	Building H Scrubber 1	55.0	24,662	20,450 to 27,500	4 year average of temperature and flow rate
HSCRUB2	Building H Scrubber 2	54.8	22,525	18,700 to 31,000	4 year average of temperature and flow rate
HSCRUB3	Building H Scrubber 3	55.0	23,950	22,200 to 25,200	4 year average of temperature and flow rate
HSCRUB4	Building H Scrubber 4	54.9	23,825	20,700 to 31,000	4 year average of temperature and flow rate
HSCRUB7F1	Building H Scrubber 7	53.7	3,680	2,200 to 6,300	5 year average of temperature and flow rate
HSCRUB7F2	Building H Scrubber 7	54.0	3,950	1,000 to 6,800	4 year average of temperature and flow rate

a. Degrees Fahrenheit.
b. Actual cubic feet per minute.

Manufacturing Process Area Exhaust Fans

On Semiconductor determined the release parameters for most of the facility's exhaust fans vents using field verification studies. Stack locations, release orientations, release heights and exit diameters were determined from the field survey and the flow rates and exit temperatures were established using multiple-year velocity and temperature measurements from 2010 to 2017. Flow rates were calculated using the measured stack diameters and average flow rates. The average values were based on a wide range of the number of velocity and temperature readings, ranging from a single year's value to an average of seven years of values (Table 15).

Table 15. EXHAUST VENT TEMPERATURES AND FLOW RATES.					
Source ID	**Source Description**	**Modeled Exit Temperature (°F)[a]**	**Modeled Exhaust Flow Rate (ACFM)[b]**	**Support Data Range of Flow Rates (ACFM)**	**Basis of Support Data Values and Comments**
BEXHF7	Building B General Exhaust	70	7,300	Single value	Single value monitored in 2017
CEXHF5	Exhaust Fan 5	64	6,233	3,800 to 11,000	3-year average
CEXHF6	Exhaust Fan 6	71	4,967	4,200 to 6,500	3-year average

DEXHF5	General Exhaust Fan	71	3,370	3,400 to 3,900	2 –year average 3,650 ACFM supported
DEXHF6	General Exhaust Fan	71	3,554	3,800 to 3,900	2-year average 3,850 ACFM supported
DEXHF8	Fab Exhaust Fan 8	69	600	550 to 750	4-year average
DEXHF15	Fab Exhaust Fan 15	71	5,841	3,100 to 7,400	5-year average 6,260 ACFM supported
GEXF29	Heating unit and building exhaust	100[c]	5,843	None –single value. Equipped with a raincap so flow rate effect is minimized.	DEQ reduced the exit temperature from 300°F to 100°F.
HSEXHF4	Fab Solvent Exhaust Fan 4	69	4,357	3,500 to 8,000	7-year average
HSEXF5	Fab Solvent Exhaust Fan 5	69	4,371	3,500 to 8,000	7-year average
HPEXHF14	Fab Pyro Exhaust Fan 14	68	1,179	700 to 3,100	7-year average
HPEXHF15	Fab Pyro Exhaust Fan 15	69	1,193	700 to 3,100	7-year average
HSEXHF17	Fab Silane Exhaust Fan 17	67	1,179	1,000 to 1,600	7-year average
HSEXHF18	Fab Silane Exhaust Fan 18	67	1,214	1,000 to 1,600	7-year average
HEXF24	Fab Exhaust 24	68	2,323	2,437 to 2,723	Carnes manufacturer performance specification sheet

a. Degrees Fahrenheit.
b. Actual cubic feet per minute.
c. DEQ altered the exit temperature to reflect a conservative temperature. Based on the source description this is combined flow from 0.2 MMBtu/hr heater and conditioned space. DEQ assumed 100°F based on most of the flow (4,815 ACFM) being 70°F space ventilation and a portion being 300°F heater flow (1,029 ACFM). Manufacturer specification sheet supplied total fan flow exhaust vent flow rate.

DEQ determined that ON Semiconductor modeled exhaust vents with appropriate stack release parameters and parameters were adequately justified and supported.

Cooling Towers

Model IDs: BCT1 and BCT2

ON Semiconductor indicated that cooling towers BCT1 and BCT2 are replacement units. There are two cells. Each cooling tower cell is equipped with a single fan. The vendor's specification sheet indicates a fan diameter of 7 feet; however, the modeled exit diameter for each cell was only 5.83 feet, which would increase the velocity of the exhaust compared to the 7 feet diameter listed in the specification sheet. The July 11, 2017 on-site field survey documentation also listed 70 inches (5.83 feet) as the exit diameter for each cell. SPX Cooling Technologies, Inc. provided the specification sheet as a product vendor. The design wet-bulb temperature for the cooling towers was 64°F and the modeled exit temperature was 65°F. Each cell had a listed fan air flow of 144,640 ACFM, and ON Semiconductor selected a flow rate of 10% of the rated fan capacity for the modeling. This is a very conservative approach and outweighs any concerns modeling the exit diameter as 5.83 feet instead of 7 feet. Stack release heights are set equal to the cooling tower cell enclosure at the top of the fan and were established by field survey.

Model IDs: CCT1 and CCT2

The modeled exit diameter for each cell matched the 8.33 feet diameter listed in the manufacturer specification sheet and July 11, 2017 field verification documentation. The modeled flow rate was 14,681 ACFM for cell CCT1and 12,030 ACFM for stack CCT2, which is 10% of the rated capacity flow rate provided in the specification sheet. This is a conservative flow rate and exit velocity.

Model IDs: DCT1 and DCT2

ON Semiconductor indicated that cooling towers DCT1 and DCT2 are replacement units. There are two cells. Each cooling tower cell is equipped with a single fan. The vendor's specification sheet indicated a fan diameter of 11 feet. The modeled exit diameter matched the specification sheet documentation. SPX Cooling Technologies, Inc. provided the specification sheet as a product vendor. The design wet-bulb temperature for the cooling towers was 69.5°F and the modeled exit temperature was 65°F. DEQ accepts the exit temperature as modeled. Individual cell listed fan air flow was 179,600 ACFM, and ON Semiconductor modeled a flow rate of 10% of the rated fan capacity for the modeling. This is a very conservative approach. Stack release heights are set equal to the cooling tower cell enclosure at the top of the fan and were established by field survey.

Model IDs: GCT1, GCT2, and GCT3

The three individual cooling tower cells are each equipped with fans of 11 feet in diameter. The 2017 onsite field survey verified this exit diameter and DEQ comparison to Google Earth Pro imagery supports the 11 feet diameter values. ON Semiconductor's spreadsheet titled "Sources list Rev 9.xls" listed a 231,930 ACFM flow rate for each cell. The modeled flow rate for each cell was 23,193 ACFM, so the exit velocity for each cell was only 1.2 meters per second. DEQ considered the flow rate and exit velocity values as conservative assumptions. The modeled exit temperature was 65°F, which was applied to all cooling towers and is accepted by DEQ as appropriate for the analyses. Modeled release heights were obtained from the July 11, 2017 field verification documentation.

The cooling towers were modeled with release parameters that were appropriate for the air impact analyses.

4.0 Results for Air Impact Analyses

This section describes the air impact modeling results for both NAAQS and TAPs analyses.

4.1 Results for Significant Impact Analyses

Table 16 provides results for the significant impact level (SIL) analysis. Note that a SIL analysis was not conducted for SO_2 because it qualifies for a BRC exemption (Table 2). Table 16 shows that the maximum predicted impacts from the ON Semiconductor facility are above the SIL for 24-hour and annual $PM_{2.5}$, 24-hour PM_{10}, and 1-hour and annual NO_2. Therefore, a cumulative NAAQS impact analysis was performed for these pollutants.

Table 16. RESULTS FOR SIGNIFICANT IMPACT LEVEL ANALYSES.

Pollutant	Averaging Period	Modeled Design Value Concentration ($\mu g/m^3$)[a]	SIL[b] ($\mu g/m^3$)	Percent of SIL
$PM_{2.5}$[c]	24-hour	10.9[g]	1.2	908%
	Annual	2.8[h]	0.3	933%
PM_{10}[d]	24-hour	59.6[i]	5.0	1,192%
NO_2[e]	1-hour	123.7[j]	7.5	1,649%
	Annual	20.0[k]	1.0	2,000%
CO[f]	1-hour	724.5[l]	2,000	36%

Table 16. RESULTS FOR SIGNIFICANT IMPACT LEVEL ANALYSES.				
Pollutant	Averaging Period	Modeled Design Value Concentration (µg/m^3)[a]	SIL[b] (µg/m^3)	Percent of SIL
	8-hour	159.7[m]	500	32%

a. Micrograms per cubic meter.
b. Significant impact level.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
e. Nitrogen dioxide.
f. Carbon Monoxide.
g. Modeled design value is the maximum 3-year mean of highest 24-hour values from each year of a 3-year meteorological dataset.
h. Modeled design value is the maximum 3-year mean of annual average values from each year of a 3-year meteorological dataset.
i. Modeled design value is the maximum of highest 24-hour values from a 3-year meteorological dataset, or the maximum of 24-hour value from three individual years of meteorological data.
j. Modeled design value is the maximum 3-year mean of maximum 1[st] highest daily 1-hour maximum impacts for each year of a 3-year meteorological dataset. The SIL compliance design value was calculated using the ARM2 method.
k. Modeled design value is the maximum annual impact of the individual years of a 3-year meteorological dataset. ARM2 method was used.
l. Modeled design value is the maximum of first highest ambient concentrations at each receptor from any of 3 individual years of meteorological data.
m. Modeled design value is the maximum of first highest ambient concentrations at each receptor from any of 3 individual years of meteorological data.

4.2 Results for Cumulative NAAQS Impact Analyses

Although the maximum modeled design values for 1-hour and 8-hour CO were below the SIL, DEQ still performed a cumulative NAAQS impact analysis for CO. For each modeled pollutant, the total impact was calculated by adding the design value (DV) of the impact to the ambient background value (Table 7). The sum was then compared to the NAAQS. The results are listed in Table 17. Ambient impacts for the facility, when combined with approved ambient backgrounds, were below the NAAQS at all receptors where ON Semiconductor modeled impacts exceeded the SIL.

Table 17. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES.						
Pollutant	Averaging Period	Modeled Design Value Concentration (µg/m^3)[a]	Background Concentration (µg/m^3)	Total Ambient Impact (µg/m^3)	NAAQS[b] (µg/m^3)	Percent of NAAQS
$PM_{2.5}$[c]	24-hour	8[g]	16	24	35	69%
	Annual	2.8[h]	4.3	7.1	12	59%
PM_{10}[d]	24-hour	52[i]	72	124	150	83%
NO_2[e]	1-hour	117.9[j]	60.2	178.1	188	95%
	Annual	20.0[k]	9.0	29.0	100	29%
CO[f]	1-hour	658[l]	3,404	4,062	40,000	10%
	8-hour	150[l]	1,151	1,301	10,000	13%

Table 17. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES.

a. Micrograms per cubic meter.
b. National ambient air quality standards.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
e. Nitrogen dioxide.
f. Carbon monoxide.
g. Modeled design value is the maximum 3-year mean of 8th highest 24-hour values from each year of a 3-year meteorological dataset.
h. Modeled design value is the maximum 3-year mean of annual average values from each year of a 3-year meteorological dataset.
i. Modeled design value is the maximum of 6th highest 24-hour values from a 3-year meteorological dataset.
j. Modeled design value is the maximum 3-year mean of 8th highest daily 1-hour maximum impacts for each year of a 3-year meteorological dataset.
k. Modeled design value is the maximum annual average value of 3 individual years of meteorological data.
l. Modeled design value is the maximum 2nd high value modeled over 3 individual years of meteorological data. This impact was included in ON Semiconductor's modeling report for the 2nd high SIL analysis impact.

Table 18 lists the location of the modeled design values. Figure 8 shows plots of design value concentrations for all pollutants and averaging periods listed in Tables 17 and 18. Only the receptors in the two innermost grids are shown. The maximum modeled concentrations, shown in red font for each pollutant and averaging period, occur at the facility fenceline.

Table 18. LOCATION OF MODELED DESIGN VALUES FOR CUMULATIVE NAAQS IMPACT ANALYSES.

Pollutant	Averaging Period	Modeled Design Value Concentration ($\mu g/m^3$)	Easting (meters)	Northing (meters)	Location relative to ON facility
$PM_{2.5}$	24-hr	8	384,531.6	4,746,780.6	SE[a]
	Annual	2.8	384,390.8	4,746,876.6	NW[b]
PM_{10}	24-hr	52	384,522.3	4,746,782.0	SE
NO_2	1-hr	117.9	384,507.8	4,747,033.6	NW
	Annual	20.0	384,475.4	4,747,003.3	NW
CO	1-hr	658	384,507.8	4,747,033.6	NW
	8-hr	150	384,531.6	4,746,780.6	SE

a. Southeast.
b. Northwest.

Figure 8. MODELED DESIGN VALUES FOR CUMULATIVE NAAQS IMPACT ANALYSES.

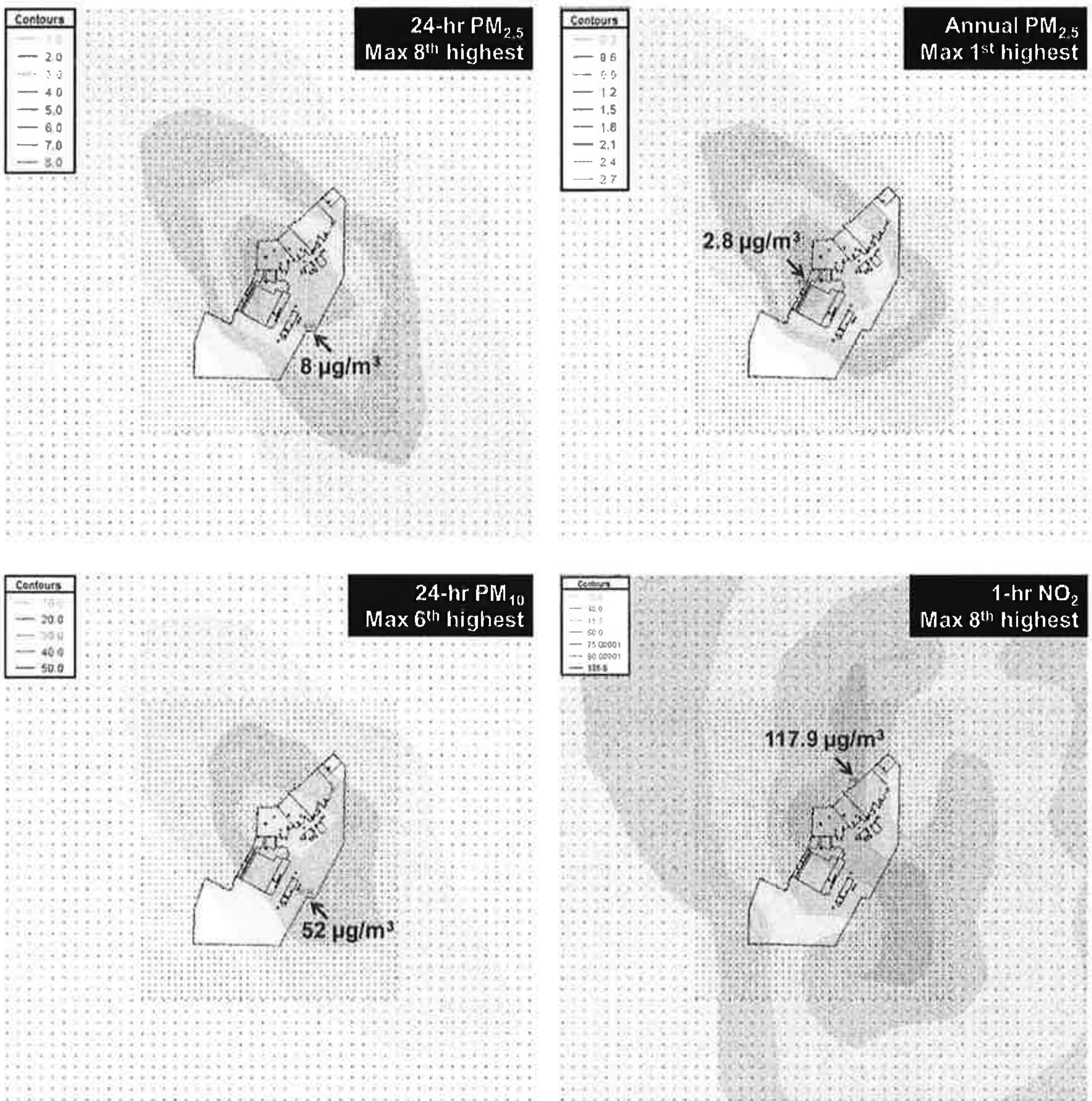
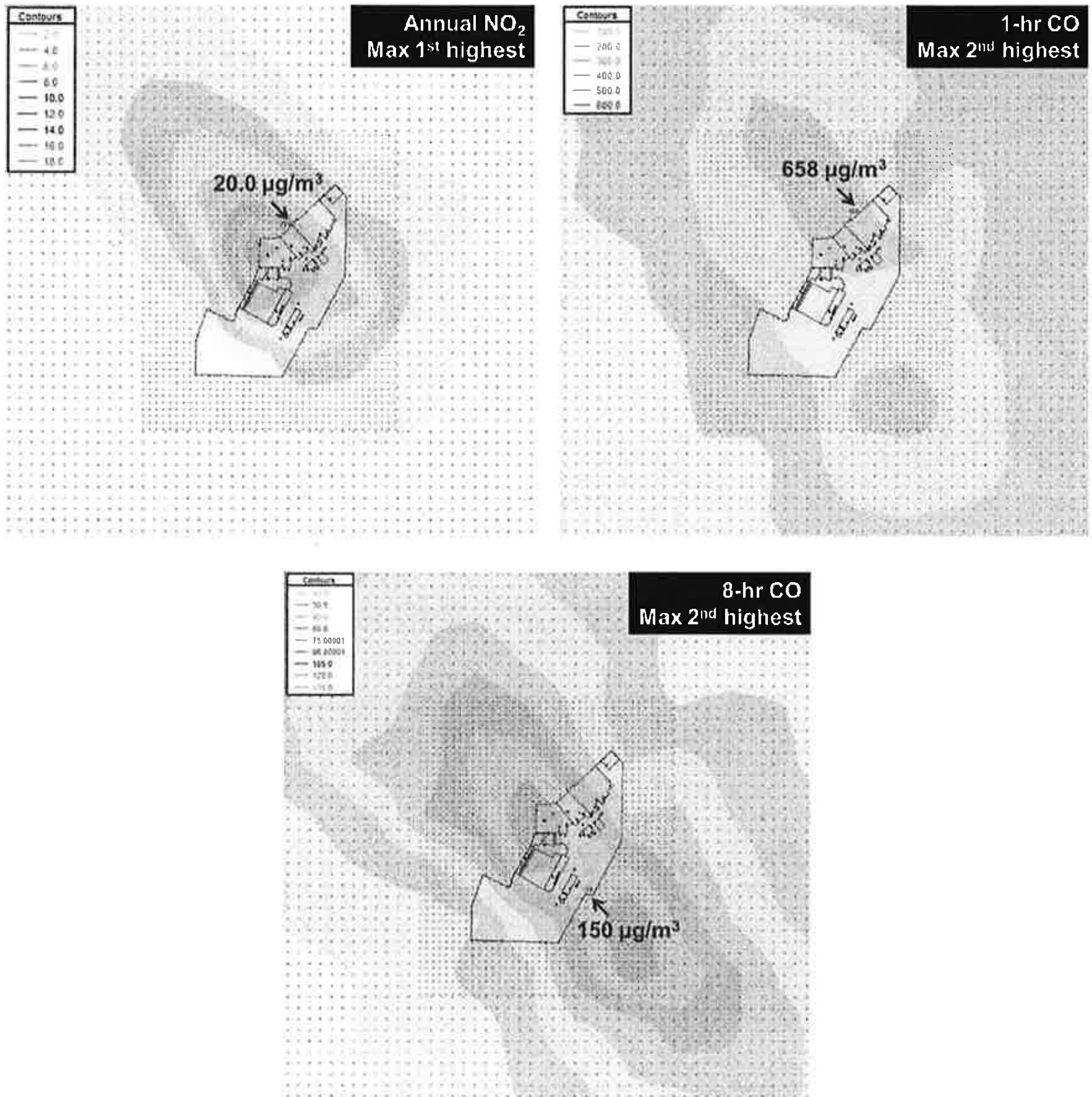


Figure 8 (continued). MODELED DESIGN VALUES FOR CUMULATIVE NAAQS IMPACT ANALYSES.



4.3 Results for Toxic Air Pollutant Impact Analyses

TAPs compliance was evaluated by determining the maximum ambient impact for all sources at the facility. Each emissions unit was modeled with a unit emission rate of 1.0 lb/hr. Table 19 shows the χ/Q impacts for all sources at the ON facility, grouped into source groups (boilers, emergency generators, exhaust, heating units, lime silo, and scrubbers). As noted in Section 3.1.4, point sources HSCRUB7F1 and HSCRUB7F2 were renamed to HSCRUBF1 and HSCRUBF2, respectively, because of the 8-character limit when outputting individual stacks on BEEST. The TAP PTE includes baseline TAP emissions (FAB9 + FAB10 + facility) and a proposed growth emission increase of 80% for the ON process TAPs.

Table 19. χ/Q UNIT EMISSION RATE IMPACTS FOR FUTURE TAPs[a] COMPLIANCE EVALUATIONS.					
Source Group	**Individual Source Model ID**	**24-hour Average Maximum Ambient Impact (μg/m³ per lb/hr)[b]**	**Annual Average Maximum Ambient Impact (μg/m³ per lb/hr)**	**Non-Carcinogenic TAPs Unit Emission Rate Design Impact for Future Compliance (μg/m³ per lb/hr)**	**Carcinogenic TAPs Unit Emission Rate Design Impact for Future Compliance (μg/m³ per lb/hr)**
Boiler	ABOI	**187.6203**	**50.1718**	187.6203	50.1718
	BBOIHWB	15.3968	4.2007		
	BBOIST	22.3247	2.2043		
	CBOIHWB	38.7878	13.6517		
	DBOIHWB	26.4444	7.3556		
	DBOIST1	29.6575	10.4715		
	GBOIHWE	60.2001	10.0352		
	GBOISB1	28.0389	5.0182		
	GBOISB2	16.2397	5.2757		
	GBOISB3	17.4511	5.8370		
	GBOISB4	31.0674	5.5754		
Emergency Generator	BEMGEN	**110.9616**	26.9980	110.9616	28.9980
	CEMGENR	100.7673	**28.9865**		
	CEMGENS	25.0531	5.2755		
	DMREMGEN	26.8850	6.3172		
	GEEMGEN	15.2485	3.7983		
	GOEMGEN	26.3011	6.4679		
Exhaust	BEXHF7	80.1752	30.2987	84.9344	**32.8189**
	CEXHF5	39.3608	13.1438		
	CEXHF6	28.4219	9.6923		
	DEXHF15	13.4799	3.4366		
	DEXHF5	46.8110	10.6702		
	DEXHF6	41.1795	7.4365		
	DEXHF8	**84.9344**	**32.8189**		
	GEXF29	23.0819	6.7846		
	HEXF24	65.7603	19.1856		
	HPEXHF14	27.6493	8.3693		
	HPEXHF15	27.6631	8.3959		
	HSEXF5	17.3790	6.4657		
	HSEXHF17	27.2832	8.1740		
	HSEXHF18	26.7481	8.0081		
	HSEXHF4	16.7754	6.2268		
Heating Unit	BHWH	48.8843	8.8977	98.9080	32.3173
	BMAU_1	46.6557	16.6980		
	BUH_1	63.1963	18.1224		
	BUH_2	84.2421	27.9017		
	BUH_3	80.0576	28.6676		
	BUH_5	84.4534	30.9535		
	BUH_6	**98.9080**	**32.3173**		
	CHWH	86.0282	22.1899		
	CUH_1	27.5488	6.5684		
	CUH_2	65.9669	23.5737		
	CUH_3	65.4414	23.5055		
	EHWH	51.3298	8.4064		
	FMAUR_1	40.3739	8.4024		
	FUH_1	66.8845	10.6421		
	FUH_2	75.5395	10.3786		
	GH10UH_1	27.5396	6.2019		
Lime Silo	LS	49.8525	7.3888	49.8525	7.3888
Scrubber	DSCRUB10	14.5269	3.0050	**38.7878**	13.0579

	DSCRUB14	14.5047	3.1274		
	DSCRUB5	26.7952	6.3491		
	DSCRUBF1	37.8705	12.6470		
	DSCRUBF2	38.3541	12.8893		
	DSCRUBF3	**38.7878**	**13.0579**		
	FSCRUB1	52.6522	10.8384		
	HSCRUB1	12.5625	4.4806		
	HSCRUB2	11.5654	4.3052		
	HSCRUB3	10.6520	4.1390		
	HSCRUB4	10.1900	3.8713		
	HSCRUBF1	16.2269	3.5809		
	HSCRUBF2	14.5331	3.7026		

a. Toxic air pollutants.
b. Micrograms per cubic meter per pound per hour – "χ/Q" impact level per unit emission rate of a pollutant.
c. Volatile Organic Compounds.
d. The combined worst-case χ/Q impact for the fugitive source component for TAPs impacts and the 25% assumed split for air makeup unit emissions results in the magnitude of the fugitive impact being 1.5 times the point source ambient impact for a unit emission rate.

The modeled worst-case 24-hour and annual χ/Q values were used to determine the concentration of TAPs for comparison against AAC and AACC limits listed in IDAPA 58.01.585-586. The worst-case 24-hour and annual χ/Q occurred with stacks DSCRUBF3 (38.79 [$\mu g/m^3$]/[lb/hr]) and DEXHF8 (32.82 [$\mu g/m^3$]/[lb/hr]), respectively. Cooling towers are not expected to emit any TAPs, as they only emit particulate matter, and were not included in the TAP impact analyses. The following equations were used to calculate the concentration of the process chemicals emitted:

$$AAC\ TAP\ Impact\ \left(\frac{\mu g}{m^3}\right) = TAP_{non-carcinogenic}\left(\frac{lb}{hr}\right) * \chi_{24-hr}/Q\left(\frac{\mu g/m^3}{lb/hr}\right)$$

$$AACC\ TAP\ Impact\ \left(\frac{\mu g}{m^3}\right) = TAP_{carcinogenic}\left(\frac{lb}{hr}\right) * \chi_{annual}/Q\left(\frac{\mu g/m^3}{lb/hr}\right)$$

where $\frac{\chi_{24-hr}}{Q} = 38.79\ \frac{\mu g/m^3}{lb/hr}$ and $\frac{\chi_{annual}}{Q} = 32.82\ \frac{\mu g/m^3}{lb/hr}$.

Compliance with TAP increments for future projects is demonstrated by multiplying the χ/Q value for either the AAC or AACC TAP by the maximum emission representative of the time interval of the standard, 24-hour averaged emissions for AACs and annual averaged emissions for AACCs.

5.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the ON Semiconductor facility in Pocatello will not cause or significantly contribute to a violation of any ambient air quality standard.

References

1. *Policy on NAAQS Compliance Demonstration Requirements of IDAPA 58.01.01.203.02 and 01.403.02.* Idaho Department of Environmental Quality Policy Memorandum. Tiffany Floyd, Administrator, Air Quality Division, June 10, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at https://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

3. *Ambient Ratio Method Version 2 (ARM2) for use with AERMOD for 1-hr NO_2 Modeling Development and Evaluation Report,* Prepared for American Petroleum Institute, 1220 L Street NW, Washington, DC 20005, by M. Podrez, RTP Environmental Associates, Inc., 2031 Broadway, Suite 2, Boulder, Colorado 80302, September 20, 2013.

4. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard,* R. Chris Owen and Roger Brode, Environmental Protection Agency, Office of Air Quality Planning and Standards, September 30, 2014.

5. *DEQ Guidance for Minor New Source Review Modeling of 1-Hour NO_2 from Intermittent Testing of Emergency Engines*, State of Idaho Department of Environmental Quality September 2013, Doc. I D AQ-011 (September 2013).

APPENDIX C – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: **ON Semiconductor**
Address: **2300 Buckskin Rd.**
City: **Pocatello**
State: **Idaho**
Zip Code: **83201**
Facility Contact: **Staci Oconnell**
Title: **Permitting Contact**
AIRS No.: **005-00017**

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	2.7	0	2.7
SO_2	0.3	0	0.3
CO	4.5	0	4.5
PM10	2.1	0	2.1
VOC	17.7	0	17.7
	0.0	0	0.0
Total:	0.0	0	**27.4**
Fee Due	**$ 5,000.00**		

Comments: Fee is based on the difference between baseline actual emissions and the requested FEC permit limits