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1410 N. Hilton
Boise, ID 83706-1255

SUBJECT: ON SEMICONDUCTORS IDAHO AIR QUALITY PERMIT-TO-CONSTRUCT APPLIC ATION

To Whom it May Concern,

Enclosed is ON Semiconductor's Idaho Air Quality Permit-to-Construct (PTC) application for submission to the Idaho Department of Environmental Quality. The application includes both a hard copy and an electronic copy on CD. The initial PTC application fee of $1,000.00 has been paid by credit card and the transaction number is 4478354.

If you have any questions or require any additional information, please don't hesitate to contact me at 208-239-7047 or at krista.johnston@onsemi.com

Sincerely,

Krista Johnston
Environmental Engineer
ON Semiconductor, Inc.

ON SEMICONDUCTOR, INC.

Voluntary

Air Quality Permit-To-Construct Application

For the facility located at:
2300 Buckskin Road
Pocatello, Idaho 83201

For submission to:
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83201

Voluntary
Air Quality Permit-To-Construct Application
ON Semiconductor, Inc.
2300 Buckskin Road
Pocatello, Idaho 83201

Date: August 2012

Prepared for: ON Semiconductor, Inc.
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Pocatello, Idaho 83201

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ACRONYMS

2SLB	2 Stroke Lean Burn
4SLB	4 Stroke Lean Burn
4SRB	4 Stroke Rich Burn
AAC	acceptable ambient concentration
AACC	acceptable ambient concentration for carcinogens
ACC	acceptable ambient concentration
ABOI	Boiler, Building A
ASTM	American Society for Testing and Materials
BAAQM	Bay Area Quality Management
BAAQM	Bay Area Quality Management District
n-BAct	N-Butyl Acetate
BCE	bag house control equipment
BCL	Boron Chloride
BF^3	Boron Triflouride
bld	building
bph	brake horsepower
BPIP	Building Profile Input Program
CaF	calcium fluoride
CEMS	Continuous Emissions Monitoring System
cf	cubic feet
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
COMS	Continuous Opacity Monitoring Systems
CPMS	Continuous Parameter Monitoring System
DEQ	U.S. Department of Environmental Quality
dscfm	dry standard cubic feet per minute
EL	emissions level
EF	emission factor
EPA	U.S. Environmental Protection Agency
ERC	Engineer Research Center

EU1	Emissions Units – Industrial Engine Information
EU5	Emissions Unit – Industrial Boiler Information
EUH	Emissions Units – Cooling Towers Information
EUO	Emissions Unit – General
FAB	fabrication
FAHS	Federal Aid Highway System
FEC	Facility Emissions Cap
ft	feet
gal	gallon
GCT1	Cooling Tower 1, Building G
GCT2	Cooling Tower 2, Building G
GEP	Good Engineering Practice
GI	General Information
gph	gallons per hour
gr/dscf	grains per dry strand cubic foot
HAPs	hazardous air pollutants
HCI	hydrogen chloride
HF	hydrogen fluoride
hp	horse power
hr	hour
ICE	Internal Combustion Engines
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
KOH	Potassium Hydroxide
kw	kilowatt
lb	pound
lbs	pounds
LHV	low heating value
LPG	liquefied petroleum gas
m	meters
MI1	Modeling Information – Impact Analysis
MI4	Modeling Information – Building and Structures
MACT	Maximum Available Control Technology

mg	milligram
mmBtu/hr	million British thermal units per hour
MSDS	Material Safety Data Sheet
mw	megawatts
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NOV	notice of violation
NFPA	National Fire Protection Association
NSCR	non-selective catalytic reduction
NSPS	New Source Performance Standards
NSR	New Source Review
O_2	oxygen
OLM	ozone limiting method
ON	On Semiconductor facility
PM	particulate matter
$PM_{2.5}$	fine particulate matter 2.5 µm in diameter or less
PM_{10}	fine particulate matter 10 µm in diameter or less
POU	point of use
ppm	parts per million
ppmV	parts per million volume
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
PTC	permit to construct
PTE	potential to emit
PTFE	polytetrafluoroethylene
RICE	reciprocating internal combustion engines
SCE	Scrubber Control Equipment
SCFH	standard cubic feet per hour
SI	spark ignition
SIP	State Implementation Plan

SO_2	sulfur dioxide
SO_x	sulfur oxide
TAP	toxic air pollutant
TBD	to be determined
TDS	total dissolved solids
tpy	tons per year
T-RACT	Toxic-Reasonable Available Control Technology
µg	microgram
UTM	Universal Transverse Mercator
VOC	volatile organic compound
wt	weight
yr	year

Voluntary
Air Quality Operating Permit-To-Construct Application
ON Semiconductor, Inc.
2300 Buckskin Road
Pocatello, Idaho 83201

1.0 EXECUTIVE SUMMARY

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.

Several distinct production processes are used, including etching, coating, doping and deposition. Silicon is the substrate on which multiple layers of various materials are deposited, via different processes, and the product is a custom integrated circuit. As part of the facility support and ancillary processes, this Site also has fuel-burning equipment. The impact of process and fuel-burning equipment on ambient air quality was evaluated. Air dispersion modeling demonstrates that ambient concentrations of criteria pollutants meet acceptable ambient air standards.

In addition to emissions estimates for criteria air pollutants, an inventory of potential toxic air pollutants (TAPs) has been included. Air dispersion modeling demonstrates that ambient concentrations of TAP pollutants meet acceptable ambient air standards.

Air quality modeling has been performed to demonstrate compliance, and to estimate the potential effects of emissions of all criteria air pollutants and TAPs that may occur during operation of the facility, as required by Idaho Air Quality Regulations.[1]

2.0 PERMIT-TO-CONSTRUCT (PTC) AIR QUALITY PERMIT REQUIREMENTS

ON is considered a minor facility based on ON's potential emissions for all criteria pollutants are less than 100 tons per year. The State of Idaho Department of Environmental Quality (IDEQ) allows application for an *Air Quality Operating Permit* when a facility is seeking to establish a Facility Emissions Cap (FEC).[2]

The purpose of this voluntary Permit-to-Construct (PTC) Application for an Air Operating Permit is to document the results of the evaluation of facility processes and to demonstrate compliance in accordance with Idaho Air Quality Rules.[3] Included in the report are estimated emission rates that can determine applicability to IDEQ regulatory review and standards.

In accordance with permit application requirements, ON proposes limits that reflect enforceable

[1] Idaho Department of Environmental Quality, Rules For The Control Of Air Pollution In Idaho, IDAPA 58 Title 01, Chapter 01, Section 202.
[2] Ibid., Section 175.
[3] Ibid., Sections 200-228.

facility wide emission limitations.[4] These emission limitations are based on process rates and process parameters that are intended as permit-monitoring requirements. The proposed monitoring requirements are described in Section 10.0.

The applicable forms required for this PTC application are included in Appendix A, IDEQ Application Forms; Appendix B, ON Emissions Inventory and Modeling Forms; Appendix C, Plot Plan; and Appendix D, Regulatory Applicability.

3.0 AIR PERMITTING BACKGROUND

ON Semiconductor submitted a permit application to the U.S. Department of Environmental Quality (DEQ) in January 1995 and DEQ stated that ON was a "minor source" and "no Tier I operating permit application is required…"

In June of 1995 ON received an application packet from DEQ for a PTC. After evaluating the regulations at that time, it was confirmed that ON did not meet the criteria for a PTC air permit, ON submitted a letter to the DEQ requesting an applicability determination on the PTC. DEQ notified ON that the Pocatello facility "does not require an air quality Permit-to-Construct" and was "categorically exempt in accordance with IDAPA 16.01.01.220 for tools and maintenance equipment, 221.d for the emergency generator, and 223.c for the boilers…" and "Therefore, this project does not require an air quality Permit-to-Construct.".

On April 25, 2002, there was an air quality inspection of the ON facility. DEQ noted that there were compliance issues with 24 out of 30 ON sources and DEQ issued a notice of violation (NOV). A meeting was held at the Pocatello DEQ office in July 2002 to review data provided by Trinity Consultants with regards to the recently issued NOVs. It appeared that all sources in question were exempt from permit requirements. DEQ suggested that ON consider applying for a Tier II permit.

On September 23, 2002, ON received a letter from DEQ requesting that ON enter a consent order and apply for a Tier II permit. A meeting was held on December 3, 2002, to discuss the NOVs and the request for a Tier II permit. It was determined that the individuals issuing NOVs weren't aware that ON had submitted previous permit applications and DEQ stated that they would review the ON historical files, including the recent inspection report and the past permit exemption determinations. On December 19th the NOVs were dismissed by Katherine B. Kelly, Air Quality Division Administrator.

In March of 2005, ON submitted a voluntary Tier II Permit application. In August of 2006, ON received a letter from DEQ stating that Tier II permit application was complete. In May 2007, ON and DEQ met to discuss alternative compliance approaches for some changes that had occurred at the ON's facility. Bill Rogers indicated that the Boise DEQ office didn't have a copy of ON's permit application and recommended that ON submit a revised application and request a Facility Emissions Cap.

In October 2008, ON asked DEQ to move forward on the voluntary Tier II permit application

[4] Idaho Department of Environmental Quality, Rules For The Control Of Air Pollution In Idaho, IDAPA 58 Title 01, Chapter 01, Section 211

submitted in 2005. At that time DEQ could no longer find a complete application package and requested that ON resubmit a complete and current application.

In October 2010, ON submitted a modeling protocol based on submitting a Tier II permit application. During the pre-application meeting with DEQ on November 1, 2010, ON was told to submit the permit application as a PTC application.

4.0 PROJECT DESCRIPTION

ON Semiconductor is voluntarily applying for an Air Quality Operating PTC as a minor source of air pollutant emissions in Pocatello, Idaho. Appendix H in Attachment 1 shows the topographic features in the vicinity of the ON facility. The facility is located just east of Interstate Highway 15 in the southeastern portion of Pocatello in Bannock County. Terrain rises to the east along the eastern side of the facility.

The facility includes ten buildings, three (B, C, D) with a common roof, situated on about 33 acres. The facility includes offices, chemical storage, support facilities, manufacturing, testing, and common space. Appendix C describes the locations of the buildings.

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. Figure 1 *Process Flow Diagram* depicts key manufacturing steps showing significant emissions, discharges and off-site disposal. In addition, wastewater treatment and parts cleaning are potential emission sources of regulated pollutants and are discussed separately.

Fuel combustion devices include hot water boilers, steam boilers and emergency generators. Specifications for these devices are provided in Appendix E.

5.0 PROCESS FLOW DIAGRAM

Figure 1 depicts key manufacturing process steps showing significant emissions, discharges, and off-site disposal. Although the schematic generalizes process flow in a single direction, individual processes may be repeated numerous times in different sequences.

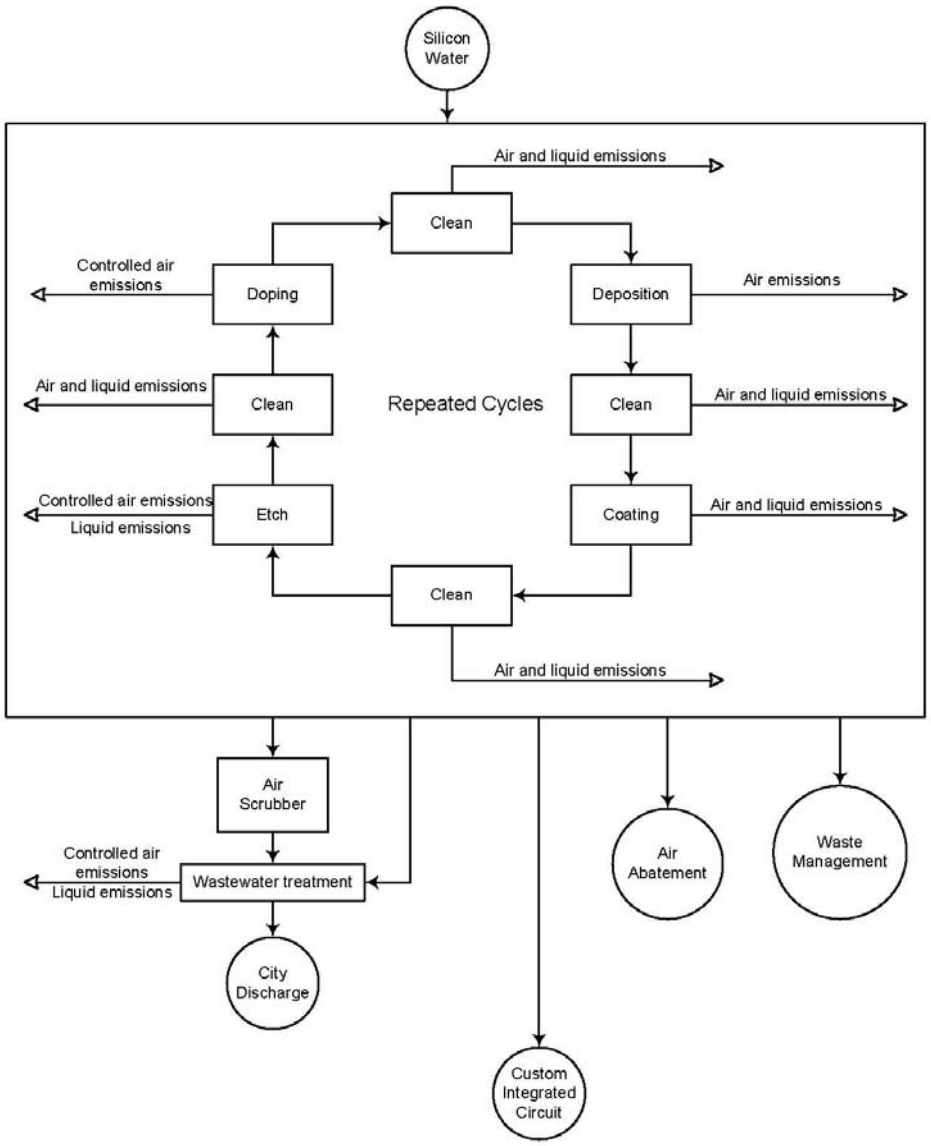

Figure 1. ON Process Flow Diagram

6.0 EQUIPMENT AND CONTROLS

6.1 Chemical Process Emissions

Manufacturing operations occur in two main fabrication areas, FAB 9 and FAB 10. The physical

and chemical processing steps used at the ON facility occur within several key process areas: wet chemical stations, coating application stations, and gaseous operation stations. Pollutant abatement systems consisting of wet and dry scrubbers are used on the majority of tools emitting inorganic compounds.

The example calculations for emissions for each FAB are included in Appendix F. These emissions are calculated using various emission factors from similar industry standards.

6.1.1 Wet Chemical Stations

Wet chemical stations include wafer cleaning and wet etching. Wet sinks are used to clean wafers. Materials used during the wet cleaning process may include hydrofluoric acid, nitric acid, phosphoric acid, hydrochloric acid, ammonium hydroxide and ammonium fluoride. Wafers are immersed in liquid-phase ("wet") etchants to remove layers of silicon. Examples of wet etchants include hydrofluoric acid.

Wet sinks and etching stations that use corrosives vent air emissions to wet scrubbers for emissions control. The liquid effluent from the scrubbers is routed to the wastewater treatment system.

6.1.2 Coating Applications

Coating applications include photolithography and emissions occur through evaporation or atomization. Typically, once the coating has been spun onto the wafer, baking the wafer at low temperatures evaporates solvents in the coating. During the coating process, other liquids may be added that also result in emissions. Emissions from these processes primarily occur in Building D and H and are generally not controlled.

6.1.3 Gaseous Operation Stations (Wafer Etchant and Deposition)

Gaseous operations include deposition, doping, and dry etching. Deposition is a process in which layers of film are formed on the wafer surface in a gaseous environment. This process typically uses combinations of the following materials: silicon, aluminum, copper, nitrogen, boron and phosphorous.

The fabrication process also uses gaseous environments to dope (e.g. ion implanter) and etch (e.g. plasma etch) specific areas on the wafers. Process chambers are used for these gas operations, and the emissions from these chambers are either controlled by wet scrubbers or point of use (POU) abatement systems. POU devices are located on all implanters and electrochemically destroy the limited amount of gases left over from the process. Examples of gases used for these applications include: chlorine, hexafluoroethane, boron trifluoride, trimethyl borate, trimethyl phosphate, phosphorous oxychloride, arsine and phosphine.

6.1.4 Pollution Abatement Systems

The main pollutant abatement systems used at the ON facility are wet and dry scrubbers. The wet spray scrubber’s utilize a reverse osmosis or deionized water solution to react and neutralize inorganic gaseous constituents. In FAB 9, the majority of exhaust from tools is

routed through wet scrubbers, in FAB 10 only the exhaust from tools using inorganic gases and liquids is routed through the wet scrubbers. No credit is taken for removal of organic emissions using the wet scrubbers when estimating emissions. The facility has 11 wet scrubbers in operation. Building H's wet scrubbers as well as DSCRUB1 and DSCRUB2 are configured for horizontal gas flow, the remaining wet scrubbers are configured with vertical gas flow. All wet scrubbers are conservatively assumed to provide a 90% removal efficiency.

A limited number of the tools in FABs 9 and 10 contain POU devices. For instance, POUs are located on all the implanters to electrochemically destroy the limited amount of gases left over from the process. The implanting process electrochemically destroys the gas left over from the process, with remaining gases routed through a dry scrubber. The POUs range from silane burnoff furnaces to cold traps. No credit is taken for the capture efficiency of these various POU devices.

Dry scrubbers are used on the implanter tools exhaust located in each FAB and for gas storage exhaust. All of the process dry scrubber exhaust is routed to wet scrubbers; therefore no credit is taken for their capture efficiency and these dry scrubbers do not appear on the source lists in Appendix A, B, or G.

The ON facility does not utilize any thermal oxidation units to control volatile organic chemicals. ON's wet scrubber emission sources are listed in Appendix G.

6.2 Facility Support Equipment and Wastewater Treatment

The example calculations for potential emissions from the facility and waste water treatment are included in Appendix F. These emissions are calculated using various emission factors from similar industry standards, except where a specific source is referenced.

6.2.1 Cooling Towers

There are eight vertical discharge, crossflow, induced draft cooling towers used for evaporative cooling as listed in Appendix H. Several of the cooling towers are only used during the summer months when additional cooling is required; typically July, August, and September. Two of the four cooling towers associated with Buildings B and C are on stand-by. In calculating the potential emissions, the stand-by cooling towers for Buildings B and C are not included since only two of the four cooling towers are operational at any one time (where there is a size difference, the emissions are calculated for the larger cooling tower). The emissions for the cooling towers that only operate during the summer are calculated over a six month period to conservatively estimate emissions.

Two new future cooling towers have been included in the FEC emissions estimate. These future cooling towers are assumed to be the same size and type of tower as the existing GCT1 and GCT2.

The example calculations for the cooling tower potential emissions are included in Appendix F. These emissions are calculated using emission factors from AP-42 for

cooling towers.[5]

6.2.2 Line Maintenance Cleaning Sinks

Cleaning materials (primarily organic solvents) are used periodically for parts cleaning. Three cleaning stations are located in the Line Maintenance Shop in Building D. The sinks share a common 8-inch diameter vent. There are also six cleaning stations in Building H. Each sink has a separate 8-inch diameter vent. Acetone and isopropyl alcohol are among the materials used in the sinks.

6.2.3 Lime Silo

Hydrated lime (calcium hydroxide) is used in a wastewater treatment process to precipitate fluoride and aid in pH adjustment. It is stored in a metal silo adjacent to Building F. The silo has a capacity of 65,000 lbs and is equipped with a baghouse filtration assembly on top. Lime is delivered and offloaded into the silo by truck quarterly. The lime is fed directly into the water treatment process inside Building F via a powder auger.

The example calculations for the Lime Silo are included in Appendix F. These emissions are calculated using emission factors from AP-42 for cement pneumatic unloading to an elevated storage silo.[6] The total PM emission factor was used to conservatively estimate the particulate matter (PM_{10}) emission rate.

6.2.4 Wastewater Treatment Processes

The ON wastewater treatment area is located inside Building F and consists of two wastewater treatment systems. The influent to one system contains a mixture of various acids and bases with the primary constituent being water. This mixture is treated with ammonia to adjust for low pH. Sodium hydroxide, sulfuric acid, or phosphoric acid may also be used to adjust pH. This system consists of an influent equalization basin, followed by three tanks in series, and an effluent equalization basin.

The influent to the other treatment system is for fluoride-containing solutions. Calcium carbonate is introduced into the system to aid in fluoride precipitation. The precipitant is routed through a filter press for dewatering. The filter cake (CaF) is disposed as a non-hazardous material. The decanted water is sent to the influent equalization basin of the first treatment system.

All holding and neutralization tanks in the process area are vented through the wastewater building wet scrubber. The general building exhaust of Building F is also routed through the scrubber.

6.3 Fuel Burning Equipment

ON's significant fuel burning emission sources are listed in Appendix E. Fuel burning sources

[5] AP 42, Fifth Edition, Vol. I Chapter 13, Section 13.4, February 1980.
[6] AP-42, Vol. I, Chapter 11, Section 11.12, Table 11.12-2.

that fall well below exemption standards are not listed in the tables. These include three domestic-sized natural gas water heaters in Buildings B, C and E, eleven natural gas space heaters, and 4 air handling units located in small support buildings throughout the facility.

6.3.1 Boilers

There are ten natural gas boilers for producing process hot water or steam located in five buildings throughout the site. Duties range from 0.7 to 10 MMBtu/hr. Several of these boilers are only used during winter months. However, in calculating potential emissions, all boilers are conservatively assumed to be operating at rated conditions throughout the year.

The larger boilers, GBOISB-1, GBOISB-2 and GBOISB-3, are subject to 40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. ON will continue to meet the requirements of 40 CFR 60 Subpart Dc. Two new potential future boilers, GBOISB-4 and GBOISB-5, have been included in the FEC emissions estimate. These future boilers are assumed to be the same size and type of boiler as the existing 10 MMBtu/hr boilers, GBOISB-1 through 3, respectively. The small boilers (e.g. < 5 MBTUs/hr) located in Buildings A, D, and G (as listed in Appendix E) qualify as inconsequential sources, however their respective potential criteria pollutants emissions are evaluated in the air dispersion modeling.

The example calculations for the criteria pollutant potential emissions are included in Appendix F. These emissions are calculated using emission factors from AP-42 for natural gas combustion units.[7] Boilers with heat input capacity <100 MMBTUs/hr are classified in AP-42 as small boilers. Unit efficiency at rated conditions was obtained from manufacturer-supplied specifications.

6.3.2 Emergency Generators

There are currently seven emergency generators installed throughout the facility to provide back-up electrical power in the case of a utility-supplied power failure. Output ranges from 15 to 1825 kilowatts. There are three main Caterpillar units that supply back-up power to critical systems such as emergency lighting, elevators, alarm systems and gas monitoring equipment in the FAB 9 and FAB 10 production areas. These larger units are diesel powered, while the smaller generators are natural gas powered.

A 1250 kW Caterpillar unit (CEMGENS), supporting FAB 9, is located outside just south of Building C. The exhaust for this unit is routed 13 ft (4.0 m) above the Building C roofline. The 1250 kW Caterpillar unit (GEEMGEN) supporting FAB 10, is located on a pad between Building G and the nitrogen plant. The exhaust from this unit is routed 16.6 feet (5.1 m) directly above the pad.

ON added an 1825 kW emergency generator in 2005 to provide additional support to the FAB 10 production area (GOEMGEN). The exhaust for this unit is exhausted 14 ft (4.3 m) above the pad. The location of this unit is south of Building G.

[7] AP-42, Fifth Ed., Vol. I, Chapter 1, Tables 1.4-1 and 1.4-2, July 1998.

Yearly emissions are calculated assuming 100 total hours of operation annually. In actuality, the generators are only operated for a few hours each month, as a maintenance procedure. In the event of an actual, extended power outage, the generators would only be operated for as long as the facility deems necessary for production purposes, with a shutdown of production in a controlled manner that ensures worker and environmental safety.

The example calculations for pollutant potential emissions are included in Appendix F. The criteria pollutants, other than SO_2, for the larger diesel engines are calculated using actual test results provided by the manufacturer. These test results are provided in Appendix I. The emissions of other regulated pollutants are calculated using emission factors from AP-42 for the large, stationary diesel engines.[8] The emissions for the smaller, natural gas generators are calculated using generalized emission factors from AP-42 for natural gas-fired reciprocating engines.[9] AP-42 emission estimates are based on the fuel usage of each emergency generator. Typical weekly testing of the emergency generators is under no load however, for emission estimating purposes, a fuel usage rate of 50% operating load for the diesel generators and 100% for the natural gas generators was used.

6.4 Miscellaneous Operations

Many ON activities do not emit regulated air pollutants. Deionized water, inert gas storage, and nitrogen production and storage are among these activities. A number of miscellaneous operations, such as process water-cooling, laboratory operations, chemical supply and related storage, sampling operations, steam vents and safety relief valves do not generate significant emissions and are considered inconsequential sources relative to the emission locations evaluated by air dispersion modeling. These sources or activities have been designated as trivial per the State of Idaho Air Quality Modeling Guidelines[10] and are not included in the significant impact analysis. These specific activities are listed below:

"Trivial" sources per Table 8 of the State of Idaho Air Quality Modeling Guideline:

- Plant maintenance and upkeep activities,
- Vents from continuous emissions monitors and other analyzers,
- Equipment used for quality control/assurance or inspection purposes, including sampling equipment used exclusively to withdraw materials for laboratory analyses and testing, and
- Boiler water treatment operations (excluding cooling towers).
- Repair and maintenance shop activities not related to the source's primary business activities,
- Steam vents and safety relief valves,
- Office activities, including use of office equipment and products, janitorial services, and bathroom vent emission

[8] AP-42, Fifth Ed., Vol. 1, Chapter 3, Tables 3.4-3 and 3.4-4., October 1996.
[9] Ibid., Chapter 3, Table 3.2-3, August 2000.
[10] State of Idaho Air Quality Modeling Guideline (draft revision 2, 2007).

There are some activities, deemed insignificant based on size or quantity[11], that the State has required be evaluated for the significant impact analysis when facility-wide modeling is conducted. These sources are listed below:

- Process water system demineralizer, demineralizer tanks, and demineralizer vents,
- Lime silos and feed bins,
- Water cooling towers no greater than 10,000 gpm and not in direct contact with gaseous or liquid streams containing regulated air pollutants,
- Combustion source, less than five million (5,000,000) Btu/hr, operating exclusively on natural gas, butane, propane, and/or liquid petroleum gas, and
- Space heaters and hot water heaters using natural gas, propane or kerosene and generating less than five million (5,000,000) Btu/hr.
- RCRA satellite accumulation areas are cabineted (completely enclosed) and routed through solvent exhaust.

For the sources listed above, the potential contribution to regulated pollutant emissions is included in the chemical inventory and are recorded through ON's chemical use tracking database. The process emissions are evaluated in the modeling analysis.

Particulate emissions from all the cooling towers at the ON facility are based on AP-42[12] emission factors and are included in the modeling analysis. At ON, exempted gas-fired heaters include domestic-type water heaters used in the process areas and space heaters used in support buildings. These include three domestic-sized natural gas water heaters in Buildings B, C and E and approximately fifteen natural gas space heaters located in small support buildings throughout the facility. The total emissions from the multiple comfort heating units are estimated to contribute from 2.4% to 6.2% per hour and 1.6% to 4.1% per year to the overall combustion equipment emissions (based on boiler emissions). Emissions were calculated based on the total heat input for all comfort heating units (3.88 MBTUs) for 24 hour a day usage, 8 months out of the year. The emissions are based on AP-42[13] emission factors for residential furnaces. Since stack/vent information for these sources (i.e. flowrates, temperature, etc) are not available, the criteria pollutants emissions and toxic air pollutants from the natural gas combustion sources (boilers) are conservatively increased by 5%, for each individual averaging period, to account for the impact from these sources.

Potential emissions from assembly, test, equipment maintenance, and final mark and pack operations associated with packaging for distribution are considered inconsequential sources relative to the emission locations evaluated by air dispersion modeling. However, the potential contribution to regulated pollutant emissions of these inconsequential sources is included in the chemical inventory amounts and the process emissions that are evaluated.

[11] "Insignificant" activities per IDAPA 58.01.01.317.01.b.
[12] AP-42, Fifth Ed., Vol. I, Chapter 13, Table 3.4-1, February 1980.

[13] AP-42, Fifth Ed., Vol. I, Chapter 1, Tables 1.4-1 and 1.4-2, July 1998.

ON facility plant upkeep does include some painting activities. An analysis of paint usage conducted in 2002 showed that VOC and HAP emissions would only contribute 0.08% and 0.11%, respectively, to the potential to emit (PTE). The majority of painting activities are completed using brushes or rollers with the remainder using spray cans. These painting activities do not require controls and their impact is not included in the modeling analysis. A more detailed description of this evaluation can be found in Attachment 1.

7.0 EMISSIONS INVENTORY

7.1 Criteria Pollutants

As part of the PTC permit application, ON is requesting a facility emissions cap on criteria and hazardous air pollutants. Table 1 summarizes the emissions from the ON facility.

Table 1. Estimated Criteria and Hazardous Pollutant Proposed FEC

FEC Components	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	VOCs	HAPs
	Tons/yr	Tons/yr	Tons/yr	Tons/yr	Tons/yr	Tons/yr	Tons/yr
Baseline	30.14	30.20	0.21	12.66	2.66	17.26	3.49
Operational Variability	--	--	--	1.18	--	12.09	2.25
Proposed Growth	5.39	9.06	0.07	5.51	0.82	6.05	1.22
Facility Emissions Cap (FEC)	35.53	39.26	0.28	19.35	3.48	35.40	6.97

The baseline emissions are based on 2007 facility-wide criteria pollutants from the operation of the production processes, general facility operations, and combustion equipment. Combustion emissions are from the operation of numerous on-site natural gas-fired boilers, natural gas-fired emergency generators and diesel-fueled emergency generators described above.

ON is not requesting the maximum operational variability (i.e. up to 1 ton per year less than the significant emission rate) for any of the criteria pollutants (i.e. those emissions associated with the fuel burning equipment). ON is proposing an operational variability component for semiconductor process related emissions only, which include volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and particulate matter (PM_{10}) based on the maximum number of wafer starts possible for each FAB.

ON is anticipating the need for two future boilers (GBOISB-4 and GBOISB-5), which have the greatest impact on the nitrogen oxide (NOx),carbon monoxide (CO), sulfur oxide (SOx), and fine particle matter ($PM_{2.5}$) emissions, and two future cooling towers, which has the greatest impact on PM_{10}. The growth component proposed is based on FAB related activities, the two potential future boilers, and the two potential future cooling towers. The growth component for:

1. Criteria pollutants (i.e. NOx, CO, SOx, and $PM_{2.5}$) is based upon the anticipated installation of two new future boilers,

2. PM_{10} is based upon a 20% growth for manufacturing capabilities and for changes in process technologies was assumed as well as the anticipated installation of two new future cooling towers, and

3. VOCs, and HAPs are based upon a 20% growth for manufacturing capabilities and for changes in process technologies was assumed.

Example calculations showing how the FEC was calculated are included in Appendix F and an electronic copy of the emission calculations are included in Appendix K.

7.1.1 Hazardous Air Pollutants (HAPs) and Volatile Organic Compounds

Hazardous Air Pollutants (HAPs) as defined by 42 USC 7412 and Volatile Organic Compounds as defined under 40 CFR 51.100(s) are present in various products used throughout the Site. Individual HAPs and VOCs used in the production areas are identified and the controlled potential emission rates are provided in Appendix B. Product data sheets or materials safety data sheets are used to identify HAPs and VOCs constituents within the products. These are provided in Appendix L.

A summary of the site-wide HAP and VOC emissions for the ON facility, including FEC increases is provided in Table 2. HAP and VOC emissions example calculations are shown in Appendix F.

Table 2. Site-Wide HAP and VOC Emission

Facility	HAP (tpy)	VOC (tpy)
Fab 9	0.977	5.521
Fab 10	1.851	9.559
Facility	0.000	0.093
Boilers	0.660	1.924
Emergency Generators	0.005	0.159
Cooling Towers	0.000	0.000
Baseline Total	3.493	17.256
Operational Variability	2.254	12.090
Proposed Growth Component	1.220	6.050
Facility Emissions Cap	6.97	35.40

The FEC Operational Variability component for the HAPs and VOCs is only based on the semiconductor process HAP and VOC emission rates. Since ON already is accounting for operating the boilers and emergency generators at their maximum operating times (i.e. 8,760 hours for the boilers and 100 hours for the emergency generators), the HAP and VOCs from this equipment were not factored into the Operational Variability. The Proposed Growth component for HAP and VOC emissions includes the 20% for semiconductor process growth and the emissions associated with the two new future boilers.

7.2 Toxic Air Pollutants

Toxic Air Pollutants as defined by IDAPA 58.01.01.585 and 586 are present in various products

used throughout the Site. A summary of all TAPs emitted facility-wide are identified by source in Appendix J and the emission rates are provided in Appendix B. A summary of the site-wide TAP emissions for the ON facility which exceed the IDAPA Emission Limit (EL) and required more refined modeling are provided in Table 3. These have been broken into two categories, the TAPs from combustion equipment, e.g. boilers and emergency generators, and those from the semiconductor fabrication process.

Table 3. TAPs Requiring Modeling to Demonstrate Emissions Meet Regulatory Limits

Toxic Air Pollutants	CAS #	Baseline (lb/hr) [a]	Projected Growth[b]	PTE[c] (lb/hr)	IDAPA EL[d] (lb/hr)	PTE % of EL
Combustion Equipment[e]						
1,3-Dichloropropene	542-75-6	3.06E-07	NA	3.06E-07	1.90E-07	161%
Nickel	7440-02-0	1.68E-04	5.17E-05	2.19E-04	2.70E-05	813%
Arsenic	7440-38-2	1.60E-05	4.92E-06	2.09E-05	1.50E-06	1393%
Formaldehyde	50-00-0	6.50E-03	1.85E-03	8.35E-03	5.10E-04	1637%
Cadmium	7440-43-9	8.79E-05	2.71E-05	1.15E-04	3.70E-06	3107%
Facility/Semiconductor Process[f]						
Hydrogen Chloride	7647-01-0	6.51E-02	5.19E-02	1.17E-01	5.00E-02	234%
Silicon Dioxide	14808-60-7	9.30E-03	7.41E-03	1.67E-02	6.70E-03	249%
Phosphoric acid	7664-38-2	1.67E-01	1.34E-01	3.01E-01	6.70E-02	449%
Hydrogen Peroxide	7722-84-1	3.03E-01	2.41E-01	5.44E-01	1.00E-01	544%
Sulfuric acid	7664-93-9	7.32E-01	5.83E-01	1.32E+00	6.70E-02	1963%

a. Pounds per hour
b. Projected growth emissions for the combustion equipment are based on two future potential boilers. Projected growth for the process emissions are based on increasing baseline emissions by 180%.
c. Sum of baseline and projected growth emissions
d. IDAPA Section 585 and 586
e. Combustion Equipment PTE emissions include inputs from the Boilers and Emergency Generators.
f. The Facility PTE emissions include Fab 9, Fab 10, and Waste Water Treatment activities. All facility TAPs that exceed the EL are non-carcinogenic.

Controlled TAP hourly emission rates for the compounds listed in Table 3 were calculated as shown in Appendix F. To demonstrate compliance with the toxic emissions standard, ON Semiconductor estimated the controlled actual (baseline) *process generated* emissions for substances listed in IDAPA 58.01.01.585 and 58.01.01.586 for calendar year 2007. Projected growth increases were estimated at 180% above actual (baseline) emissions. Combustion equipment TAPs are based on AP-42 factors with projected growth based on the two potential future boilers described above. PTE emission rates include projected growth.[14]

[14] IDAPA 58 Title 01, Chapter 01, Section 210.08. Per the Modeling Guideline "it follows that controlled ambient concentrations will be below TAPs increments of Idaho Air Rules Section 585 and 586 if controlled emissions are below the ELs."

8.0 AIR DISPERSION MODELING

The purpose of performing air dispersion modeling for ON's PTC Operating Permit Application is to demonstrate ON's existing compliance with all applicable ambient air quality standards.[15] This analysis demonstrates that potential impacts of ON facility operations meet all National Ambient Air Quality Standards (NAAQS) and applicable Idaho air quality impact limits.[16]

The emission rates utilized in this air quality modeling analysis are based on maximum projected FEC and TAP estimates. The modeled rates demonstrate that the proposed emission limitations described in Section 10.0 ensure that ambient air quality impacts are within all applicable standards. The information required for completing the air modeling, including model description, site and source data, receptor information, meteorological data, etc were provided in the Modeling Protocol submitted to IDEQ in October 2010. Attachment 1 provides the ON Semiconductor Modeling Report which describes how the modeling was conducted, including differences from what was proposed in the modeling protocol.

Based on updated modeling threshold values provided by IDEQ[17], ON Semiconductor is not modeling for SO_2 and Lead. SO_2 emission rates are below Tier I thresholds for all averaging periods and there are no lead emissions from the ON facility based on the chemical inventory. The $PM_{2.5}$, PM_{10}, CO (1-hr) and NOx emissions exceed the Level I threshold and therefore modeling is required for these pollutants.

Table 4. Comparison of Emissions Against DEQ Modeling Thresholds

Criteria Air Pollutants	Averaging Period	DEQ Modeling Threshold				ON Semiconductor Potential to Emit	
		Tier I		Tier II (Case-by-Case)			
PM_{10}	24-hr	0.22	lb/hr	2.6	lb/hr	4.29	lb/hr
$PM_{2.5}$	24-hr	0.054	lb/hr	0.63	lb/hr	0.80	lb/hr
	Annual	0.35	T/yr	4.1	T/yr	3.48	t/yr
CO	1-hr	15	lb/hr	175	lb/hr	24.88	lb/hr
	8-hr	15	lb/hr	175	lb/hr	10.79	lb/hr
NO2	1-hour	0.20	lb/hr	2.4	T/yr	80.12	lb/hr
	Annual	1.2	T/yr	14	T/yr	35.53	t/yr
SO2	1-hr	0.21	lb/hr	2.5	lb/hr	0.10	lb/hr
	24-hr	0.22	lb/hr	2.6	lb/hr	0.06	lb/hr
	Annual	1.2	T/yr	14	T/yr	0.28	t/yr
Lead	3-month rolling avg	14	lb/mo	--	--	0.0	lb/hr

[15] IDEQ, *Air Quality Modeling Guideline*, Section 1.0, page 1.
[16] Idaho Department of Environmental Quality, Rules For The Control Of Air Pollution In Idaho, IDAPA 58 Title 01, Chapter 01, Section 203.
[17] Facility ID No. 005-00017, ON Semiconductor, Inc. [formerly AMI Semiconductor, Inc.] Modeling Protocol Approval for the Initial FEC PTC for an Existing Manufacturing Facility, Revision 1

8.1 Evaluation of Compliance with Standards

The ambient air quality impact limits applicable to this facility's permit are the National Ambient Air Quality Standards (NAAQS) for criteria pollutants.[18] The *Rules for the Control of Air Pollution in Idaho* incorporates the NAAQS standards for criteria pollutants.[19] Those limits, and the predicted maximum ambient concentrations during facility operation, which includes background concentrations, are shown in Table 5 below.

Table 5. Background Concentration, Ambient Impact Limits & Comparison of Predicted Concentration with NAAQS Standards

Pollutant	Averaging Period	Background Concentration (µg/m³)	Modeled Value Used (µg/m³)	Worst Case Total Concentration (µg/m³)	Significant Contribution Levels (µg/m³)	NAAQS (µg/m³)	Location Of Highest Impact[2]	Modeled Value Used
NO_2	1-hour	(Note 1)	(Note 1)	147.8	7.5	188.7	E of Bld G on fence line	Maximum 8th highest
	Annual	12	12.1	24.1	1.0	100	E of Bld B on fence line	Maximum 1st highest
CO	1-hour	15,600	457	16,057	2,000	40,000	E of Bld G on fence line	Maximum 2nd highest
	8-hour	5,200	132	5,332	500	10,000	E of Bld G on fence line	Maximum 2nd highest
PM_{10}	24-hour	68	75.6	143.6	5.0	150	E of Bld G on fence line	Maximum 6th highest
$PM_{2.5}$	24-hour	27.6	6.5	34.1	1.2	35	E of Bld B on fence line	Maximum 1st highest
	Annual	7.8	1.2	9	0.3	15	W of Bld H on fence line	Maximum 1st highest

1. Due to the complexity of the hourly NO_2 air dispersion modeling, actual facility emissions were modeled along with hourly NO_2 background concentrations.
2. Location where maximum 1st highest concentration occurs.

For all averaging periods for all pollutants, the maximum combined impact of the ON facilities occurred on the property boundary. The modeled worst-case impact entry represents the required maximum predicted impact, as presented in Table 5, for all pollutants and averaging periods, over five years.

ON Semiconductor is an existing facility and the impacts are a part of the background, however, it is clear that even if the impacts were not part of the background the facility would still comply with the NAAQS. As shown in Table 5, predicted maximum ambient concentrations for all criteria pollutants are below National Ambient Air Quality Standards and CO emissions concentrations for each averaging period are actually below significant contribution levels. The actual hourly NO_2 emissions were modeled in AERMOD with the respective hourly background

[18] Idaho Department of Environmental Quality, Rules For The Control Of Air Pollution In Idaho, IDAPA 58 Title 01, Chapter 01, Section 203.
[19] Ibid., Section 107.03.

concentrations provided by IDEQ[20]. The maximum 8th highest concentration provided in Table 5 for NO_2 includes NO_2 background concentrations. The Modeling Report in Attachment 1 provides a more detailed description of how hourly NO_2 modeling was completed.

The modeled worst case 24-hour and annual Chi/Q for *process* sources was used to determine the concentration of the process chemicals listed in Table 3 for comparison against acceptable ambient concentration (AAC) and acceptable ambient concentration for carcinogens (AACC) limits listed in IDAPA 58.01.01.585-586. The following equations were used to calculate the concentration of the released ON process chemicals:

$$\text{AAC TAP Emission } (\mu g/m^3) = TAP_{non\text{-}carcinogenic} \text{ (lb/hr)} * Chi_{24\text{-}hr}/Q \ (\mu g/m^3/lb/hr)$$
$$\text{AACC TAP Emission } (\mu g/m^3) = TAP_{carcinogenic} \text{ (lb/hr)} * Chi_{annual}/Q \ (\mu g/m^3/lb/hr)$$

The methodology for how $Chi_{24\text{-}hr}/Q$ and Chi_{annual}/Q were determined are described in Appendix F.

For the combustion equipment TAPs listed in Table 3, each emission source was modeled in AERMOD assuming a unit release rate (1 g/s) similar to the criteria pollutants. The methodology for how the combustion equipment TAP concentrations were determined are described in Attachment 1.

The TAP PTE includes facility-wide baseline TAP emissions and proposed growth emission increases of 180% for the ON process TAPs and the equivalent of two new boilers for the combustion equipment TAPs. As can be seen from Table 6, the baseline emissions as well as projected emission increases are below the ambient air concentration limits in IDAPA 58.01.01 585 and 586.[21]

[20] Facility ID No. 005-00017, ON Semiconductor, Inc. [formerly AMI Semiconductor, Inc.] Modeling Protocol Approval for the Initial FEC PTC for an Existing Manufacturing Facility, Revision 1

[21] Idaho Department of Environmental Quality, Rules For The Control Of Air Pollution In Idaho, IDAPA 58 Title 01, Chapter 01, Section 210.08

Table 6. Facility-Wide Emission Comparison to Acceptable Ambient Concentration for Non-Carcinogen and Carcinogenic Toxic Air Pollutants Standards

Toxic Air Pollutants	CAS #	PTE (lb/hr)	Chi/Q[1,2] [(mg/m3)/(lb/hr)]	Maximum Predicted Impact (mg/m³) or (µg/m³)	AAC/ AACC (mg/m³) or (µg/m³)	%AAC or %AACC
Process						
Hydrogen Chloride	7647-01-0	1.17E-01	0.0355	4.15E-03	3.75E-01	1%
Silicon Dioxide	14808-60-7	1.67E-02	0.0355	5.93E-04	5.00E-03	12%
Phosphoric acid	7664-38-2	3.01E-01	0.0355	1.07E-02	5.00E-02	21%
Hydrogen Peroxide	7722-84-1	5.44E-01	0.0355	1.93E-02	7.50E-02	26%
Sulfuric acid	7664-93-9	1.32E+00	0.0355	4.67E-02	5.00E-02	93%
Combustion Equipment						
1,3-Dichloropropene	542-75-6	3.06E-07	--	1.43E-07	2.90E-06	5%
Nickel	7440-02-0	2.19E-04	--	3.25E-04	4.20E-03	8%
Arsenic	7440-38-2	2.09E-05	--	3.1E-05	2.30E-04	13%
Formaldehyde	50-00-0	8.35E-03	--	1.16E-02	7.70E-02	15%
Cadmium	7440-43-9	1.15E-04	--	1.70E-04	5.60E-04	30%

1. TAP Chi/Q evaluations for the boilers and emergency generators are based on the individual stack and are calculated by summing over the number of sources; the concentration for the specified stack, receptor and averaging time for each pollutant. A maximum Chi/Q per stack was not used.
2. The process worse-case $Chi/Q_{24\text{-}hr}$ occurred for stack HSCRUB7F2. The worse-case $Chi/Q_{24\text{-}hr}$ = 282 (µg/m^3)/(g/s) which is equivalent to 0.0355 (mg/m^3)/(lb/hr). All facility TAPs that exceed the EL are non-carcinogenic.

9.0 REGULATORY REVIEW

Appendix D contains a regulatory evaluation of the applicable State and National air quality rules with respect to this PTC. The following regulatory standards were evaluated:

- IDAPA 58.01.01.175
- IDAPA 58.01.01.200
- 40 CFR 60 Subpart Dc
- 40 CFR 60 Subpart Q
- 40 CFR 60 Subpart IIII
- 40 CFR 60 Subpart DDDDD
- 40 CFR 63 Subpart JJJJ
- 40 CFR 63 Subpart ZZZZ
- 40 CFR 63 Subpart BBBBB

10.0 PROPOSED EMISSION LIMITATIONS AND COMPLIANCE PLAN

The emissions calculations for this application are based on boiler and emergency generator fuel

usage and operating times, cooling tower flowrates and total dissolved solids concentrations and chemical usage for maximum wafer production rates. The following sections describe the requested emission limits and requirements for demonstrating compliance.

10.1 Facility Emissions Cap

ON proposes to establish FECs for criteria pollutants, HAPs, and VOCs to allow flexibility to install new fabrication tool or reconfigure existing tools without requiring a PTC determination. Table 1 provides the proposed baseline, growth, and operational variability components. ON is proposing that the NOx, CO, SOx, PM_{10}, $PM_{2.5}$, VOCs, and HAPs emissions from the ON facility shall not exceed any corresponding FEC limit listed in Table 1. The operating conditions proposed in Sections 10.4 and 10.5 as well as the reporting and recordkeeping requirements described in Sections 10.7 establish appropriate conditions to ensure compliance with the FEC.

Compliance with the FEC for the criteria pollutants NOx, SOx, CO, HAPs, VOC, PM_{10}, and $PM_{2.5}$ associated with the fuel burning equipment will be demonstrated by maintaining fuel consumption and operational time records. Emissions will be calculated monthly based on these records and the applicable emission factors and equations provided in Appendix F.

Compliance with the FEC for HAPs, VOCs and PM_{10} for the ON manufacturing and facility processes will be demonstrated by maintaining chemical material usage records, disposal records, and operational time records, as required. Estimates for process and facility emissions will be calculated monthly based on these records and the applicable emission factors and equations provided in Appendix F.

A 12-month rolling emissions estimate for the total emissions of criteria pollutants, HAPs, and VOCs from all sources will be calculated for reporting and demonstrating compliance in accordance with IDAPA 58.01.01.178.04(b).

10.2 HAPs

Compliance for HAP FEC emissions will be the same as described for the criteria pollutants. Individual and total HAP emissions will be calculated on a monthly basis per applicable records and the emission factors and equations provided in Appendix F.

Chemical material usage is tracked through a chemical consumption tracking system. This tracking system utilizes MSDS's or product data sheets to track chemicals by their CAS numbers and chemical name. Some of these raw materials are or contain chemicals that are pollutants listed as HAPs in the Clean Air Act Amendments of 1990.[22] The chemical consumption tracking system is compiled monthly from records generated by ON's Oracle™ data management system. Oracle™ tracks the chemicals brought on-site, units (bottles, drums, liters, etc) taken from storage, and remaining number of units in storage at the end of the month.

10.3 TAPs

The chemical tracking system discussed above will also be used to track pollutants listed in

[22] Section 112(b) of the Clean Air Act.

IDAPA 58.01.01.585 and 586 and will be updated to estimate monthly average hourly TAP emissions. If the monthly average TAP emission rate increase exceeds 95% of a respective AAC or AACC limit, ON will conduct a more refined analysis of that respective TAP to demonstrate compliance with the respective AAC or AACC limit. The average monthly emission rate will be calculated by 1) summing the total usage of each pollutant per month, 2) dividing by the hours of operation per month, and 3) subtracting the baseline hourly emission rate. Appendix F provides a description of how the process TAP emission increase calculations will be determined.

ON is requesting a baseline hourly emission rate be established for the pollutants listed in Table 7. If a baseline emission rate is not established for a specific pollutant, the baseline emission rate is assumed to be zero.

Table 7. TAP Baseline Emission Rates

Toxic Air Pollutants	CAS #	Baseline (lb/hr)
Hydrogen Peroxide	7722-84-1	3.03E-01
Sulfuric acid	7664-93-9	7.32E-01

TAP emissions will be calculated on a monthly basis per applicable records and the emission factors and equations provided in Appendix F.

10.4 Semiconductor Operations

10.4.1 Wet Scrubbers

Wet scrubbers provide emissions controls for the majority of inorganic emissions emitted from FAB tools. The wet scrubber's utilize a reverse osmosis or deionized water solution to react and neutralize inorganic gaseous constituents. The liquid recirculation rate and conductivity directly relate to the scrubbers efficiency.

Instruments to monitor liquid recirculation flow rate and conductivity are installed and maintained for each scrubber. The flow rate and conductivity will be recorded once per day.

Maintenance and operation of the wet scrubbers is per the manufactures Operations and Maintenance Manuals with the exception of conductivity. ON Semiconductor has evaluated the wet scrubbers' chemistry for the specific FAB processes and has developed the conductivity operating ranges required to maintain proper performance for each of the wet scrubbers based on process knowledge.

10.4.2 Baghouse

The baghouse provides emissions controls for the lime silo. Lime is utilized in the wastewater treatment process to precipitate fluoride and aid in pH adjustment. Particulate emissions (PM_{10}) are the only emission relevant to the baghouse. Since there is no induced draft through the silo and baghouse except during loading of the silo, which occurs four to

six times a year, no permit limits are deemed necessary.

Maintenance and operation of the baghouse is per the manufactures Operations and Maintenance Manual.

10.5 Facility Operations

10.5.1 Boilers

Three of the existing 10 boilers (GBOISB1-3) are NSPS Subpart Dc affected units. To comply with the requirements of NSPS Subpart Dc, for each affected boiler ON Semiconductor will:

1) monitor and record the fuel usage for the boilers on a monthly basis,

2) maintain a startup, shutdown and malfunction record, and

3) for boilers installed after the issuance of this permit; IDEQ will be provides design heat input capacity and fuel type, actual date of initial startup, and notification of the date of construction.

For all other boilers, ON will monitor and record the fuel usage for the boilers on a monthly basis for emissions tracking purposes.

10.5.2 Emergency Generators

ON will monitor and record the hours of operation for each of the seven emergency generators on a weekly basis. The testing of the emergency generators will follow the schedule provided in Table 8. The duration of the emergency generator testing may occur anytime within the hour specified for the specific generator.

Table 8. Emergency Generator Routine Testing Schedule

Generator	Day of week	Time period		Duration of operation (min)	Weekly Engine Test Loading	Loading Used to Estimate PTE
BEMGEN	Monday	2:00 - 3:00	PM	30	No load	100%
CEMGENR	Sunday	2:00 - 3:00	PM	30	No load	100%
CEMGENS	Thursday	2:00 - 3:00	AM	30	No load	50%
DEMGEN	Saturday	1:00 - 2:00	PM	30	No load	100%
DMREMGEN	Friday	7:00 - 8:00	AM	30	No load	100%
GEEMGEN	Wednesday	1:00 - 2:00	PM	30	No load	50%
GOEMGEN	Tuesday	2:00 - 3:00	PM	30	No load	50%

Weekly emergency engine testing is done under no load. However, the emergency diesel generators will need to undergo annual testing (once per year) according to the following testing schedule:

- 1 hour at 20% load,
- 1 hour at 40% load,
- 1 hour at 60% load,
- 1 hour at 80% load, and then
- 1 hour at 100% load.

Annual testing of each emergency diesel generator will be done individually and will not overlap with the testing of another emergency diesel generator. Load testing is required on the diesel generators to ensure that they continue to operate properly.

All of the emergency generators are NESHAPs Subpart ZZZZ affected units. To comply with the requirements of NESHAPs Subpart ZZZZ, for each generator ON Semiconductor will:

- Operate and maintain the stationary reciprocating internal combustion engines (RICE) according to the manufacturer's emission-related operation and maintenance instructions,
- Inspect air cleaner annually, and
- Inspect all hoses and belts annually and replace as necessary.

For the spark ignited engines, ON Semiconductor will:

- Change oil and filter annually.

For the compression ignited engines, ON Semiconductor will:

- Utilize an oil analysis program in order to extend the specified oil change requirement (i.e. annually or every 500 hours).

10.5.3 Cooling Towers

The cooling tower water circulation flow is a fixed rate based on the pump speed and therefore this parameter is not monitored or recorded. Operating times for the cooling towers or combination of cooling towers will not exceed the maximum times used to establish emission limitations, see Table 9. A log of operational status for each cooling tower will be maintained. Operating times shall be collected on a monthly basis and used to calculate the monthly and 12-month rolling emissions for PM_{10}. Monthly operating time records will be maintained for the cooling towers.

Table 9. Cooling Tower Operating Limits

Location	Unit ID(s)	On-line Rating Used for PTE (hrs/yr)	Remarks
Building B	BCT1 and BCT2	13,140	Assumed one tower operates year round and one is on-line for 6 months of the year.
Building C	CCT1 and CCT2	13,140	Assumed one tower operates year round and one is on-line for 6 months of the year.
Building D	DCT1 and DCT2	13,140	Assumed one tower operates year round and one is on-line for 6 months of the year.
Building G	GCT1	8,760	Assumed to operate year round.
Building G	GCT2	8,760	Assumed to operate year round.

Maintenance and operation of the cooling towers is per the manufacture's Operations and Maintenance Manual.

10.6 Reporting

ON will submit an annual report each year. The annual report will contain the 12-month rolling emissions rate for total criteria and HAP emissions in tons per year.

10.7 Record Keeping

Records will be maintained on site for a period of at least 5 years. Records will include monthly emissions calculations, annual reports, material usage records, operating and maintenance logs, monitoring data, etc.

11.0 CERTIFICATION

I hereby certify that based upon information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.

John Spicer
(printed name)

(signature)

Site Manager of Pocatello Operations
(title)

Aug 23, 2012
(date)

Appendix A

IDEQ Application Forms

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Baghouse Control Equipment - Form BCE A-28
Scrubber Control Equipment - Form SCE A-34

Facility Information - Form GI

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

General Information **Form GI**
Revision 7
2/18/10

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION			
1. Company Name		2. Facility Name	
ON Semiconductor		ON Semiconductor	
3. Brief Project Description	Semiconductor manufacturing facility		
FACILITY INFORMATION			
4. Primary Facility Permit Contact Person/Title	Krista Johnston	Environmental Engineer	
5. Telephone Number and Email Address	208-239-7047	Krista.Johnston@onsemi.com	
6. Alternate Facility Contact Person/Title	Staci O'Connell	Environmental, Health, & Safety Manager	
7. Telephone Number and Email Address	208-234-6028	Staci.O'Connell@onsemi.com	
8. Address to Which the Permit Should be Sent	2300 Buckskin Rd		
9. City/County/State/Zip Code	Pocatello	ID	83201
10. Equipment Location Address (if different than the mailing address above)			
11. City/County/State/Zip Code			
12. Is the Equipment Portable?	☐ Yes ☒ No		
13. SIC Code(s) and NAICS Code	Primary SIC: 334413	Secondary SIC:	NAICS:
14. Brief Business Description and Principal Product	Semiconductor manufacaturing facility		
15. Indentify any adjacent or contiguous facility that this company owns and/or operates	Engineer Recearch Center (ERC) 1777 Alvin Ricken Drive, Pocatello, ID 83201		
16. Specify the reason for the application	☒ Permit to Construct (PTC) For Tier I permitted facilities only: If you are applying for a PTC then you must also specify how the PTC will be incorporated into the Tier I permit. ☐ Incorporate the PTC at the time of the Tier I renewal ☐ Co-process the Tier I modification and PTC ☐ Administratively amend the Tier I permit to incorporate the PTC upon your request (IDAPA 58.01.01.209.05.a, b, or c) ☐ Tier I Permit ☐ Tier II Permit ☐ Tier II/Permit to Construct		
CERTIFICATION			
In accordance with **IDAPA 58.01.01.123 (Rules for the Control of Air Pollution in Idaho)**, I certify based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.			
17. Responsible Official's Name/Title	John Spicer	Director of Pocatello Manufacturing	
18. Responsible Official's Signature	John Spicer	Date	Aug 23, 2012
19. ☒ Check here to indicate that you would like to review the draft permit prior to final issuance.			

Emissions Unit- General - Form EUO

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3. Facility ID No:
ON Semiconductor	ON Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
5. Emissions Unit (EU) Name:	FAB 9 & FAB 10
6. EU ID Number:	FAB 9 & FAB 10
7. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8. Manufacturer:	NA
9. Model:	NA
10.. Maximum Capacity:	391,040 WAFER STARTS
11. Date of Construction:	FAB 9 - 1978, FAB 10 - JULY 1995
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☐ No ☒ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT	
14. Control Equipment Name and ID:	Multiple - See Appendix G
15. Date of Installation:	See App. G 16. Date of Modification (if any):
17. Manufacturer and Model Number:	Multiple - See Form SCE
18. ID(s) of Emission Unit Controlled:	FAB 9 and FAB 10
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☒ No (If Yes, attach and label manufacturer guarantee)

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. FAB scrubbers remove inorganic air pollutants such as HCl, HF, and arsine at >90%

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
22. Actual Operation:	24 HOURS PER DAY, 365 DAYS PER YEAR
23. Maximum Operation:	24 HOURS PER DAY, 365 DAYS PER YEAR

REQUESTED LIMITS	
24. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, indicate all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☒ Other:	FACILITY EMISSIONS CAP
25. Rationale for Requesting the Limit(s):	ALLOWS FLEXIBILITY FOR OPERATING A RAPIDLY EVOLVING INDUSTRY

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Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3. Facility ID No:
ON Semiconductor	ON Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
5. Emissions Unit (EU) Name:	WASTE WATER TREATMENT
6. EU ID Number:	BLD F
7. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8. Manufacturer:	NA
9. Model:	NA
10.. Maximum Capacity:	840,000 GALLONS PER DAY
11. Date of Construction:	1983
12. Date of Modification (if any):	
13. Is this a Controlled Emission Unit?	☐ No ☒ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT		
14. Control Equipment Name and ID:	Building F Scrubber 1, FSCRUB1	
15. Date of Installation:	1983	16. Date of Modification (if any):
17. Manufacturer and Model Number:	See Form SCE	
18. ID(s) of Emission Unit Controlled:	Bld F	
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No	
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☒ No (If Yes, attach and label manufacturer guarantee)	

	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency						

21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. FAB scrubbers remove inorganic air pollutants such as HCl, HF, and arsine at >90%

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
22. Actual Operation:	24 HOURS PER DAY, 365 DAYS PER YEAR
23. Maximum Operation:	24 HOURS PER DAY, 365 DAYS PER YEAR

REQUESTED LIMITS	
24. Are you requesting any permit limits?	☒ Yes ☐ No (If Yes, indicate all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☒ Other:	FACILITY EMISSIONS CAP
25. Rationale for Requesting the Limit(s):	ALLOWS FLEXIBILITY FOR OPERATING A RAPIDLY EVOLVING INDUSTRY

Page 1

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Unit - General **Form EU0**
Revision 4
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3. Facility ID No:
ON Semiconductor	ON Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
5. Emissions Unit (EU) Name:	LIME SILO
6. EU ID Number:	LS
7. EU Type:	☐ New Source ☒ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
8. Manufacturer:	CUSTOM
9. Model:	CUSTOM
10.. Maximum Capacity:	2403 FT^3
11. Date of Construction:	1984
12. Date of Modification (if any):	N/A
13. Is this a Controlled Emission Unit?	☐ No ☒ Yes If Yes, complete the following section. If No, go to line 22.

EMISSIONS CONTROL EQUIPMENT						
14. Control Equipment Name and ID:	Baghouse, BH					
15. Date of Installation:	1984	16. Date of Modification (if any):	N/A			
17. Manufacturer and Model Number:	FLEX KLEEN CORP					
18. ID(s) of Emission Unit Controlled:						
19. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No					
20. Does the manufacturer guarantee the control efficiency of the control equipment?	☒ Yes ☐ No (If Yes, attach and label manufacturer guarantee)					
	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency	0.02 gr/dscfm					
21. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency.						

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
22. Actual Operation:	2 HOURS/QUARTER
23. Maximum Operation:	4 HOURS/QUARTER

REQUESTED LIMITS	
24. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, indicate all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing:	Please attach all relevant stack testing summary reports
☐ Other:	
25. Rationale for Requesting the Limit(s):	

Emissions Units-Industrial Engine Information - Form EU1

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	0.4925 (liters per cylinder)	6. Ignition Type:	☐ Compression ☒ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number: BEMGEN	9. Maximum Rated Engine Power: 34 Brake Horsepower (bhp)		
10. Construction Date: 1970	11. Manufacturer: Onan	12. Model: 15RJC	13. Model Year: Unkown
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate			255	
19. Actual Consumption Rate			Unknown	
20. Sulfur Content wt%		N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): 100 hours per year
22. Operating Schedule (hours/day, months/year, etc.): Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	0.4925 (liters per cylinder)	6. Ignition Type:	☐ Compression ☒ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number: CEMGENR	9. Maximum Rated Engine Power: 34 Brake Horsepower (bhp)		
10. Construction Date: 1974	11. Manufacturer: Onan	12. Model: 15ORJC-3R/4688AA	13. Model Year: Unkown
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate			255	
19. Actual Consumption Rate			Unknown	
20. Sulfur Content wt%		N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): 100 hours per year
22. Operating Schedule (hours/day, months/year, etc.): Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours

DEQ AIR QUALITY PROGRAM
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Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	4.32 (liters per cylinder)	6. Ignition Type:	☒ Compression ☐ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number: CEMGENS	9. Maximum Rated Engine Power: 1818 Brake Horsepower (bhp)		
10. Construction Date: 2001	11. Manufacturer: Caterpillar	12. Model: 1250	13. Model Year: 1996
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☒ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☐ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate	90.8			
19. Actual Consumption Rate	Unknown			
20. Sulfur Content wt%	0.0015%	N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): 100 hours per year
22. Operating Schedule (hours/day, months/year, etc.): Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	
ON Semiconductor	ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	0.942 (liters per cylinder)	6. Ignition Type:	☐ Compression ☒ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number:	9. Maximum Rated Engine Power:		
DEMGEN	82 Brake Horsepower (bhp)		
10. Construction Date:	11. Manufacturer:	12. Model:	13. Model Year:
1983	Onanr	30 OEK-15R/9336M	Unknown
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☐ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate			600	
19. Actual Consumption Rate			Unknown	
20. Sulfur Content wt%		N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):
100 hours per year
22. Operating Schedule (hours/day, months/year, etc.):
Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	0.82 (liters per cylinder)	6. Ignition Type:	☐ Compression ☒ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number: DMREMGEN	9. Maximum Rated Engine Power: 126 Brake Horsepower (bhp)		
10. Construction Date: 1996	11. Manufacturer: Kohler	12. Model: 60RZ72	13. Model Year: Unknown
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☐ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☒ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate			960	
19. Actual Consumption Rate			Unknown	
20. Sulfur Content wt%		N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): 100 hours per year
22. Operating Schedule (hours/day, months/year, etc.): Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	
ON Semiconductor	ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	4.324(liters per cylinder)	6. Ignition Type:	☒ Compression ☐ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number:	9. Maximum Rated Engine Power:		
GEEMGEN	1818 Brake Horsepower (bhp)		
10. Construction Date:	11. Manufacturer:	12. Model:	13. Model Year:
1998	Caterpiller	1250	1996
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☒ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☐ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate	90.8			
19. Actual Consumption Rate	Unknown			
20. Sulfur Content wt%	0.0015%	N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):
100 hours per year
22. Operating Schedule (hours/day, months/year, etc.):
Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: ON Semiconductor	005-00017
3 Brief Project Description:	Semiconductor manufacturing facility	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS			
4. Type of Unit:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:		
5. Engine Displacement:	4.324(liters per cylinder)	6. Ignition Type:	☒ Compression ☐ Spark
7. Use	☒ Emergency ☐ Non-Emergency		
8. Engine ID Number: GOEMGEN	9. Maximum Rated Engine Power: 2000 Brake Horsepower (bhp)		
10. Construction Date: 2005	11. Manufacturer: Caterpillar	12. Model: 1825	13. Model Year: 2001
14. Date of Modification (if applicable):	15. Serial Number (if available):	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS				
17. Fuel Type	☒ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☐ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate	123.1			
19. Actual Consumption Rate	Unknown			
20. Sulfur Content wt%	0.0015%	N/A	N/A	

OPERATING LIMITS & SCHEDULE
21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.): 100 hours per year
22. Operating Schedule (hours/day, months/year, etc.): Tested once a week to ensure proper operation for ~ a half-hour. Maximum duration an emergency generator has been operated at the ON facility is 6 consecutive hours.

Emissions Units-Cooling Towers Information - Form EU4

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Cooling Towers Information **Form EU4**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3. Facility ID No:
ON Semiconductor	ON Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

COOLING TOWER IDENTIFICATION AND DESCRIPTION	Tower 1	Tower 2	Tower 3	Tower 4
5. Emission Unit Name	Bld B Cooling Tower 1	Bld B Cooling Tower 2	Bld C Cooling Tower 1	Bld C Cooling Tower 2
6. Emission Unit ID Number	BCT1	BCT2	CCT1	CCT2
7. Stack/Vent ID Number	BCT1	BCT2	CCT1	CCT2
8. Tower Type (N: New, U: Unpermitted, M: Modification)	☐ N, ☒ U, ☐ M	☐ N, ☒ U, ☐ M	☐ N, ☒ U, ☐ M	☐ N, ☒ U, ☐ M
9. Current Permit Number				
10. Tower Construction Date	1979	1996	1994	1985
11. Tower Manufacturer	Marley	Marley	Marley	Marley
12. Tower Model Number	8811	NC 211CM	NC 211CM	NC 211CM
13. Number of Cells in Tower	1	1	1	1
14. Tower Maximum Water Flow Rate	112,200 gph	51,480 gph	96,000 gph	96,000 gph
15. Measured TDS Content (if known)	1,856	1,856	1,856	1,856
16. Do you use additives in the water? If Yes, provide an MSDS form for each additive	☐ No ☒ Yes	☐ No ☒ Yes	☐ No ☒ Yes	☐ No ☒ Yes
CONTROL EQUIPMENT INFORMATION				
17. Control Equipment	☒ No ☐ Yes	☒ No ☐ Yes	☒ No ☐ Yes	☒ No ☐ Yes
18. Control Equipment ID Number				
19. Control Equipment Efficiency				
OPERATING SCHEDULE				
20. Actual Operation (hours per year)				
21. Maximum Operation (hours per year)	8760	4380	8760	4380

REQUEST FOR PERMIT LIMITATIONS

22 Are you requesting any permit limits? ☐ No ☒ Yes. If Yes, fill in all that apply below.

Tower Served	Operation Hour Limits:	TDS Limits (ppm):	Material Usage Limits:	Other:
Tower 1	See rational			
Tower 2	See rational			
Tower 3	See rational			
Tower 4	See rational			

23. Rationale for Requesting the Limit(s): It is requested that an operational limit be set for the pair of cooling towers for Building B not to exceed 13,140 hours,i.e. one is operational all year while one is only operational up to 6 months per year. Their combined operating time shall not exceed 13,140 hours per year. It is requested that an operational limit be set for the pair of cooling towers for Building C not to exceed 13,140 hours,i.e. one is operational all year while one is only operational up to 6 months per year. Their combined operating time shall not exceed 13,140 hours per year

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Cooling Towers Information **Form EU4**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3. Facility ID No:
ON Semiconductor	ON Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

COOLING TOWER IDENTIFICATION AND DESCRIPTION				
	Tower 1	Tower 2	Tower 3	Tower 4
5. Emission Unit Name	Bld D Cooling Tower 1	Bld D Cooling Tower 2	Bld G Cooling Tower 1	Bld G Cooling Tower 2
6. Emission Unit ID Number	DCT1	DCT2	GCT1	GCT2
7. Stack/Vent ID Number	DCT1	DCT2	GCT1	GCT2
8. Tower Type (N: New, U: Unpermitted, M: Modification)	☐ N, ☒ U, ☐ M	☐ N, ☒ U, ☐ M	☐ N, ☒ U, ☐ M	☐ N, ☒ U, ☐ M
9. Current Permit Number				
10. Tower Construction Date	1983	1983	Unknown	Unknown
11. Tower Manufacturer	Marley	Marley	Marley	Marley
12. Tower Model Number	8815	8815	NC 9142CS	NC 9142CS
13. Number of Cells in Tower	1	1	2	2
14. Tower Maximum Water Flow Rate	107,220 gph	107,220 gph	180,000 gph	180,000 gph
15. Measured TDS Content (if known)	1,856	1,856	1,856	1,856
16. Do you use additives in the water? If Yes, provide an MSDS form for each additive	☐ No ☒ Yes	☐ No ☒ Yes	☐ No ☒ Yes	☐ No ☒ Yes
CONTROL EQUIPMENT INFORMATION				
17. Control Equipment	☒ No ☐ Yes	☒ No ☐ Yes	☒ No ☐ Yes	☒ No ☐ Yes
18. Control Equipment ID Number				
19. Control Equipment Efficiency				
OPERATING SCHEDULE				
20. Actual Operation (hours per year)				
21. Maximum Operation (hours per year)	8760	4,380	8760	8760

REQUEST FOR PERMIT LIMITATIONS

22 Are you requesting any permit limits? ☐ No ☒ Yes. If Yes, fill in all that apply below.

Tower Served	Operation Hour Limits:	TDS Limits (ppm):	Material Usage Limits:	Other:
Tower 1	See rational			
Tower 2	See rational			
Tower 3				
Tower 4				

23. Rationale for Requesting the Limit(s): It is requested that the operational limit be set for the pair of cooling towers for Building D not to exceed 13,140 hours, i.e. one is operational all year while one is only operational up to 6 months per year. Their combined operating time shall not exceed 13,140 hours per year.

Emissions Units-Industrial Boiler Information - Form EU5

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3 Facility ID No:
ON Semiconductor	On Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:	
6. Use of Boiler:	☐ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%	
7. Boiler ID Number: ABOI	8. Rated Capacity: ☒ 0.69 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1987	10. Manufacturer: Teledyne Laars	11. Model: PH0850 IN0 9K01
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		833		
17. Actual Consumption Rate		143		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (^{o}F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE		
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week
27. NSPS Applicability: ☐ Yes ☒ No	If Yes, which subpart:	

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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: On Semiconductor	3 Facility ID No: 005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: ☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:		
6. Use of Boiler: ☐ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%		
7. Boiler ID Number: BBOIHWB	8. Rated Capacity: ☒ 6.7 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1990	10. Manufacturer: Sellers 15	11. Model: Senior S-200-W
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		8205		
17. Actual Consumption Rate		2031		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (^{0}F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE	
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):	24 hrs/day, 7 days a week
27. NSPS Applicability: ☐ Yes ☒ No	If Yes, which subpart:

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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3 Facility ID No:
ON Semiconductor	On Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: ☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:

6. Use of Boiler: ☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%

7. Boiler ID Number: BBOIST	8. Rated Capacity: ☒ 5.86 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1995	10. Manufacturer: Sellers 15	11. Model: Senior 175 HP
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		7179		
17. Actual Consumption Rate		1688		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):	24 hrs/day, 7 days a week
27. NSPS Applicability: ☐ Yes ☒ No	If Yes, which subpart:

DEQ AIR QUALITY PROGRAM
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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3 Facility ID No:
ON Semiconductor	On Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:	
6. Use of Boiler:	☐ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%	
7. Boiler ID Number: CBOIHWB	8. Rated Capacity: ☒ 6.7 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1982	10. Manufacturer: Sellers 15	11. Model: Senior S-200-W
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		8205		
17. Actual Consumption Rate		320		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):	24 hrs/day, 7 days a week
27. NSPS Applicability: ☐ Yes ☒ No	If Yes, which subpart:

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: On Semiconductor	3 Facility ID No: 005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: ☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:		
6. Use of Boiler: ☐ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%		
7. Boiler ID Number: DBOIHWB	8. Rated Capacity: ☒ 6.7 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1982	10. Manufacturer: Sellers 15	11. Model: Senior S-200-W
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		8205		
17. Actual Consumption Rate		1910		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (^{0}F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE		
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week
27. NSPS Applicability: ☐ Yes ☒ No	If Yes, which subpart:	

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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3 Facility ID No:
ON Semiconductor	On Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:	
6. Use of Boiler:	☒ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 100%	
7. Boiler ID Number: DBOIST1	8. Rated Capacity: ☒ 4.18 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1983	10. Manufacturer: Sellers 15	11. Model: Commodore 125
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		5128		
17. Actual Consumption Rate		925		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (^{0}F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week
27. NSPS Applicability: ☐ Yes ☒ No	If Yes, which subpart:	

DEQ AIR QUALITY PROGRAM
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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: On Semiconductor	3 Facility ID No: 005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request:	☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:	
6. Use of Boiler:	☐ % Used For Process ☐ % Used For Space Heat ☐ % Used For Generating Electricity ☒ Other: eye wash temperature control	
7. Boiler ID Number: GBOIHWE	8. Rated Capacity: ☒ 1.16 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1997	10. Manufacturer: Lochinvar	11. Model: CWN1436PM
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		1407		
17. Actual Consumption Rate		1407		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE			
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr	
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week	
27. NSPS Applicability:	☐ Yes ☒ No	If Yes, which subpart:	

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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: On Semiconductor	3 Facility ID No: 005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: ☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:		
6. Use of Boiler: ☒ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 50%/50%		
7. Boiler ID Number: GBOISB1	8. Rated Capacity: ☒ 10.04 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1997	10. Manufacturer: Sellers	11. Model: 300-SH-LN-390
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		12,307		
17. Actual Consumption Rate		2324		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (^{o}F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE		
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week
27. NSPS Applicability: ☒ Yes ☐ No	If Yes, which subpart:	40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

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Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name:	2. Facility Name:	3 Facility ID No:
ON Semiconductor	On Semiconductor	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: ☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:		
6. Use of Boiler: ☒ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 50%/50%		
7. Boiler ID Number: GBOISB2	8. Rated Capacity: ☒ 10.04 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1997	10. Manufacturer: Sellers	11. Model: 300-SH-LN-390
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		12,307		
17. Actual Consumption Rate		1694		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE			
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr	
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week	
27. NSPS Applicability:	☒ Yes ☐ No	If Yes, which subpart:	40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

DEQ AIR QUALITY PROGRAM
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Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: ON Semiconductor	2. Facility Name: On Semiconductor	3 Facility ID No: 005-00017
4. Brief Project Description:	Semiconductor manufacturing facility	

EXEMPTION
Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: ☐ New Unit ☒ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:		
6. Use of Boiler: ☒ % Used For Process ☒ % Used For Space Heat ☐ % Used For Generating Electricity ☐ Other: 50%/50%		
7. Boiler ID Number: GBOISB3	8. Rated Capacity: ☒ 10.04 Million British Thermal Units Per Hour (MMBtu/hr) ☐ 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1997	10. Manufacturer: Sellers	11. Model: 300-SH-LN-390
12. Date of Modification (if applicable):	13. Serial Number (if available):	14. Control Device (if any): **Note: Attach applicable control equipment form(s)**

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	☐ Diesel Fuel (#) (gal/hr)	☒ Natural Gas (cf/hr)	☐ Coal (unit: /hr)	☐ Other Fuels (unit: /hr)
16. Full Load Consumption Rate		12,307		
17. Actual Consumption Rate		1745		
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%		0.001-0.002		
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (^{o}F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	☐ Saturated ☐ Superheated	☐ Saturated ☐ Superheated

OPERATING LIMITS & SCHEDULE		
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):		8760 hrs/yr
26. Operating Schedule (hours/day, months/year, etc.):		24 hrs/day, 7 days a week
27. NSPS Applicability: ☒ Yes ☐ No	If Yes, which subpart:	40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Baghouse Control Equipment - Form BCE

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Baghouse Control Equipment **Form BCE**
Revision 6
2/18/10

Complete this form for each baghouse. Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name	2. Facility Name:	
ON Semiconductor	ON Semiconductor	Facility ID No: 005-00017
3. Brief Project Description: Semiconductor manufacturing facility		

BAGHOUSE INFORMATION		
4. Baghouse Manufacturer: Flex-Kleen	5. Baghouse Model: 84-BVBS-9 (IIG)	6. Baghouse Equipment ID: BH

7 (a). Baghouse particulate matter emission concentration. **Note: Provide information in 7(a)-(c) or answer question #8 below.**	0.02 gr/dscf	*Manufacturers typically provide guarantees in grains per dry standard cubic foot (gr/dscf). Provide a copy of the guarantee, or other documentation, with the application along with a description of the types of bags that must be used to achieve the emission concentration.* ***Emission concentrations less than 0.01 gr/dscf will receive additional scrutiny by DEQ and a source test of the baghouse may be required.*** *If a guarantee is not provided then you must document how you obtained the emission concentration. Without documentation the application is not complete.*
7 (b). Percentage PM_{10} Or Provide PM_{10} Emission Concentration	_____ % 0.02 gr/dscf	*What percentage of the PM concentration listed in question #7(a) is PM_{10}. You must provide documentation as to how the percentage was determined (i.e per the baghouse manufacturer). Without documentation the application is not complete.*
7 (c). Baghouse flow rate	500 dscfm	*Provide the baghouse flow rate in dry standard cubic feet per minute. Actual cubic feet per minute may be given in lieu of dscfm* ***if it is documented*** *that moisture content is insignificant. You must provide documentation as to how this flow rate was determined (i.e. per the exhaust fan manufacturer, combustion evaluation, etc.). Without documentation the application is not complete.*
8. Baghouse particulate matter control efficiency. **Note: Not needed if section #7 is completed.**	_____ % PM control _____ % PM_{10} control	*Applicant's providing the control efficiency of the baghouse must provide control efficiency for both PM and PM_{10}. Provide a copy of the control efficiency documentation with the application. Documentation must include a description of the types of bags that must be used to achieve the control efficiency. Without documentation the application is not complete.*
9. Is the baghouse equipped with a bag leak detector?	☐ Yes ☒ No	*If a bag leak detector is installed provide documentation on the leak detector, including; how the leak detector functions and what level of the output signal indicates that a bag is leaking. Without documentation the application is not complete.*

Equipment ID-BH

FLEX-KLEEN
Dust Collection Systems
50 YEARS
A Met-Pro Product Recovery/Pollution Control Technologies Business

DUST COLLECTOR PERFORMANCE WARRANTIES

1. PARTICULATE EMISSIONS

Within three (3) months after start-up of the equipment or twelve (12) months from date of delivery of major components, whichever occurs first, the Purchaser / Owner may at his expense, have conducted by an independent qualified company or governmental agency, a test to determine that the equipment is meeting the following outlet emissions:

PM Statement:

Flex-Kleen warrants, when the equipment covered by this agreement, is adjusted and operates at the design operating conditions, as specified below; that the maximum total solid particulate emissions (PM) exiting the bag house will not exceed 0.02 grains per dry standard cubic foot of air (gr/dscf).

PM_{10} Statement:

Flex-Kleen warrants, when the equipment covered by this agreement, is adjusted and operates at the design operating conditions, as specified below; that the maximum total solid particulate emissions less than 10 microns (PM_{10}) exiting the bag house will not exceed 0.02 grains per dry standard cubic foot of air (gr/dscf).

Design Operating Conditions:

FKO#:	10-52-18119
Model:	84-BVBS-9 (IIG)
Design Airflow:	500 Dry Standard Cubic Foot per Minute
Design Temp:	-30°F to 90°F
Dust:	Hydrated Lime
Bulk Density:	25-35 #/ft³
Source of Dust:	Pneumatic fill of silo from supply truck.

Flex-Kleen
45 North Brandon Drive, Glendale Heights, IL 60139
Tel: 630-775-0707 • Fax: 630-295-9019
info@flex-kleen.com • www.flex-kleen.com

MET PRO CORPORATION

Equipment ID- BH

FLEX-KLEEN
Dust Collection Systems
50 YEARS
A Met-Pro Product Recovery/Pollution Control Technologies Business

FLEX-KLEEN DUST COLLECTOR PERFORMANCE WARRANTIES (Continued)

A. QUALIFICATIONS

The above stated warranties are subject to the following:

1. Performance tests for outlet emissions will be conducted in accordance with the dry portion (front half catch excluding impingement train) of the EPA Test Train & Test Method Number 5, as specified in Appendix A of the Code of Federal Regulations, Title 40 CFR, Part 60 (7-1-93 edition).

2. Within 5 days before the outlet emission performance test date, the equipment shall be operated for a period of no less than 72 continuous hours at the specified design operating conditions.

3. Solid particulate shall be defined as any dry, finely divided material, such as dust, smoke or fume that exists as a dry solid phase (excluding any and all condensable compounds) at the operating temperature and pressure as designated within the specifications.

4. The demonstration of successful performance tests will consist of a minimum of three (3) valid tests with the arithmetic mean of the three (3) tests at or below the outlet loading at design operating conditions. Pressure drop readings will be taken over a period of 3 substantially consecutive days of operation.

5. Fuel and/or dust characteristics remain as specified within subject specification. Pulse air used for cleaning the filter bags must be free of solid and liquid contaminants.

6. The operating conditions at the inlet to the baghouse shall not exceed the "Design Inlet Conditions" as specified in the proposal for each process collector. Temperature excursions must not exceed the specified bag design temperature or operate below a temperature less than 25 Fahrenheit degrees above the water and residual acid dew points.

7. If for any reasons the equipment operates outside the designated parameters during this warranty period (i.e. implosions or explosions, temperature excursions above the design temperature specified for each process service, moisture content, etc.) the baghouse must be placed immediately into the bypass mode, and Flex-Kleen should be notified to evaluate and/or recommend alternate methods of operating the baghouse.

8. Start-up and operating procedures must be in accordance with Flex-Kleen's Start-Up, Operation and Maintenance Manual or must be approved by Flex-Kleen in case of any deviations.

9. This guarantee is based on the Owner, operating and maintaining the equipment in accordance with Flex-Kleen's maintenance and operating manual and good operating practices. If, because of delays or improper operation, between completion of erection and the performance tests, and the equipment is not in the same condition as when the initial tests were scheduled, the Purchaser/Owner shall restore the equipment, at Purchaser's/Owner's expense, to such condition before any tests may be conducted. In addition, a complete operating log monitoring volume, temperature, and pressure must be maintained to verify the system had been operating within the specified conditions.

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MET-PRO CORPORATION

Equipment ID- BH

FLEX-KLEEN
Dust Collection Systems
50 YEARS
A Met-Pro Product Recovery/Pollution Control Technologies Business

FLEX-KLEEN DUST COLLECTOR PERFORMANCE WARRANTIES (Continued)

A. QUALIFICATIONS (Continued)

10. New bags supplied under warranty will be guaranteed only for the balance of the remaining warranty. All replacement bags and cages provided during the warranty period will be purchased from Flex-Kleen.

11. The bag life warranty does not cover damage due to faulty installation, fire, negligence, or chemical attack or corrosion, and in such an event the warranty will be null and void.

12. Processes which include the possibility for hydrocarbon carryover, in particular those projects which utilize filters with PTFE membrane, should include the necessary protection for the filter elements such as a precoat material, specifically during start up and shut down procedures when carryover is most likely to occur. The warranty does not cover damage due to hydrocarbon carryover effects.

B. REMEDY

If the results of any of the tests show the collector has not met its guarantees as specified above, the Purchaser will promptly notify Flex-Kleen in writing and submit copies of the results of such test(s) for Flex-Kleen's review. Thereafter, Flex-Kleen will be given a reasonable opportunity to perform its own tests. During the tests performed by Flex-Kleen, the Purchaser shall make available, free of charge to Flex-Kleen, qualified personnel to properly operate the equipment. The Purchaser shall also furnish all such utilities and materials required to perform such test at no charge to Flex-Kleen.

Should the Flex-Kleen conducted test substantiate that the equipment has not met its guarantee(s), Flex-Kleen shall make such modifications and adjustments as it deems appropriate to correct the deficiency(ies) including the supplying of such additional equipment appropriate up to a maximum of 10% of the equipment sales price, F.O.B. Shipping Point. Installation of such additional equipment will be by Purchaser.

If the equipment operates outside the limits of the specified operating conditions, and Flex-Kleen is not notified of the variables, this warranty becomes null and void.

C. RESPONSIBILITY

Flex-Kleen's responsibility shall in no case exceed the liabilities stated in this guarantee. Buyer's remedy or remedies against Flex-Kleen and/or Flex-Kleen's liability relating to the performance of the warranties hereunder shall be solely and exclusively limited to those as provided herein.

EXCEPT AS STATED IN THIS PERFORMANCE WARRANTY AND EXCEPT AS TO TITLE, THERE ARE NO GUARANTEES OR WARRANTIES OF MERCHANTABILITY, FITNESS, PERFORMANCE OR OTHERWISE, EXPRESS, IMPLIED OR STATUTORY, AND FLEX-KLEEN SHALL HAVE NO LIABILITY FOR CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES, HOWSOEVER CAUSED.

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MET PRO CORPORATION

Equipment ID- BH

FLEX-KLEEN
Dust Collection Systems
50 YEARS
A Met-Pro Product Recovery/Pollution Control Technologies Business

PURCHASER'S ACCEPTANCE

X_____

Title: _____

Date: _____

FLEX-KLEEN ACCEPTANCE

X_____

Title: Aftermarket Manager

Flex-Kleen
45 North Brandon Drive, Glendale Heights, IL 60139
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info@flex-kleen.com • www.flex-kleen.com

MET PRO CORPORATION

Scrubber Control Equipment - Form SCE

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Scrubber Control Equipment - **Form SCE**
Revision 5
08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name:	ON Semiconductor	2. Facility Name:	ON Semiconductor	3. Facility ID No.:	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility				

EMISSION UNIT ID				SCRUBBER					
5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Emission Unit	EU ID No.	CE ID No.	Stack ID No.	Manufacturer Name	Model No.	Type	Dimensions In Feet (Ht x Dia x L)	Water Flow (gpm)	Pressure Drop (in H_2O)
Fab 9 & Fab 10	Fab 9 & Fab 10	DSCRUB 1 or 2	DSCRUBF 1, 2, or 3	Harrington	79-3	wet/spray	9.6 x 7 x 9	50	0.5
Fab 9 & Fab 10	Fab 9 & Fab 10	DSCRUB 1 or 2	DSCRUBF 1,2, or 3	Harrington	79-3	wet/spray	9.6 x 7 x 9	50	0.5
Fab 9 & Fab 10	Fab 9 & Fab 10	DSCRUB5	DSCRUB5	Harrington	ECH-55-5LB	wet/spray	6 x 5 x 6.7	20	0.85
Fab 9 & Fab 10	Fab 9 & Fab 10	DSCRUB 10	DSCRUB 10	Harrington	ECH-44-3LB	wet/spray	6.7 x 4.1 x 4.5	10	0.5
Fab 9 & Fab 10	Fab 9 & Fab 10	DSCRUB 14	DSCRUB 14	Harrington	ECH-33-5LB	wet/spray	5.6 x 3.2 x 5	20	.035
Fab 9 & Fab 10	Fab 9 & Fab 10	HSCRUB1	HSCRUB1	Harrington	ECH-9 11-5LB	wet/spray	11 x 11.2 x7.5	80	0.4
Fab 9 & Fab 10	Fab 9 & Fab 10	HSCRUB2	HSCRUB2	Harrington	ECH-9 11-5LB	wet/spray	11 x 11.2 x7.5	80	0.8
Fab 9 & Fab 10	Fab 9 & Fab 10	HSCRUB3	HSCRUB3	Harrington	ECH-9 11-5LB	wet/spray	11 x 11.2 x 7.5	80	0.5
Fab 9 & Fab 10	Fab 9 & Fab 10	HSCRUB4	HSCRUB4	Harrington	ECH-9 11-5LB	wet/spray	11 x 11.2 x 7.5	80	0.5

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Scrubber Control Equipment - **Form SCE**
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IDENTIFICATION

1. Company Name:	ON Semiconductor	2. Facility Name:	ON Semiconductor	3. Facility ID No.:	005-00017
4. Brief Project Description:	Semiconductor manufacturing facility				

EMISSION UNIT ID				SCRUBBER					
5.	6.	7.	8.	9.	10.	11.	12.	13	14.
Emission Unit	EU ID No.	CE ID No.	Stack ID No.	Manufacturer Name	Model No.	Type	Dimensions In Feet (Ht x Dia x L)	Water Flow (gpm)	Pressure Drop (in H_2O)
Fab 9 & Fab 10	Fab 9 & Fab 10	HSCRUB7	HSCRUB7 F1 or F2	Tri-mer	F/WR-10-48-2	wet scrubber	12.33 x 7.75 x 15.5	140	0.1
Waste Water Treatment System	Bld F	FSCRUB1	FSCRUB1	Harrington	HPH 34-3	wet scrubber	5.2 x 4 x 9.3	44	1.5

Harrington Environmental Engineering
Performance Characteristics

Name	Acid Scrubber
Quantity	3
Tag	SC-1, SC-2, SC-3
Air Flow Conditions (Per scrubber)	24,000 SCFM Present 30,000 SCFM Future

Contaminants/Expected Removal Efficiencies

Acetic Acid	CH3COCH3	95 percent
Chlorine	Cl2	99 percent
Hydrofluoric acid	HF	95 percent
Hydrochloric acid	HCl	95 percent

Scrubber Inlet Temperatures	65 – 85 F
Scrubber Type (wet packed bed scrubber)	Horizontal cross flow or Vertical counter current
Manufacturer	Harrington Environmental Engineering
Model	ECH 78-4 LB
Duct size	32 Inch Diameter
Electrical	
Pump HP	5 HP (Qty:2)
Power	480/3/60
Motor Enclosure	TEFC
Control Panel Enclosure	Nema 4
UL Listed	Required

Tri-Mer Corporation
Performance Characteristics

I.A PURPOSE

This system absorbs acid fumes that are being ventilated from the customer's process. It allows customer's employees to work in close proximity to reactor vessels that are the source of the acid fumes. It serves the customer, their employees and the community by controlling the acid fumes from the source to exit of the cleaned gases to the atmosphere.

I.B. PERFORMANCE CHARACTERISTICS

The Tri-Mer® Corporation scrubber will be fully guaranteed to perform the following load reduction efficiencies:

I. Hydrofluoric Acid - 6.0 ppmV down to 1.0 ppmV.

II. Hydrochloric Acid - 9.0 ppmV down to 1.0 ppmV.

III. Sulfuric Acid - 5.3 mg/M^3 down to 1 mg/M^3.

IV. If Nitrogen Dioxide is present in the airstream in the form of NO_x ($NO + NO_2$) requires a totally different chemistry than what is proposed for scrubber package.

NOTE: Any plume created during the ventilation where NH_3 mixes with HF or HCl, could create ammonium chlorides and fluorides which are sub-micron aerosols. A different technology needs to be applied to remove such particles.

These are minimum guarantees of the system under standard operating conditions. Tri-Mer® expects a performance of 90-95% reduction on nitric, hydrofluoric, hydrochloric and sulfuric acids.

Because the inlet loads are so minimal based on the volume of air, it is difficult to work with standard packing factors and HTU values as those of typical systems where inlet loads on average are 100-200 ppmV or milligrams per cubic meter.

I.C. THEORY OF OPERATION

This system utilizes mass transfer when acid fumes are drawn across a packed bed and are absorbed into water. By maintaining a constant replenishment of fresh water, the acid fumes can be continually absorbed. The packed bed is maintained saturated by a recirculation pump and sump tank integral to the system. The fan motive continuously pulls the polluted gases through the saturated bed.

Appendix B

IDEQ ON Emissions Inventory and Modeling Forms

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FACILITY WIDE POTENTIAL TO EMIT EMISSION INVENTORY

POTENTIAL TO EMIT FOR NSR REGULATED POLLUTANTS

Emission ID	NOx tons/yr	CO tons/yr	SO_2 tons/yr	PM-2.5 tons/yr	PM-10 tons/yr	VOC tons/yr	HAP tons/yr
ABOI	3.83E-01	3.22E-01	2.30E-03	2.91E-02	--	2.11E-02	0.007230529
BBOIHWB	3.77E+00	3.17E+00	2.26E-02	2.87E-01	--	2.08E-01	7.12E-02
BBOIST	3.30E+00	2.77E+00	1.98E-02	2.51E-01	--	1.82E-01	6.23E-02
CBOIHWB	3.77E+00	3.17E+00	2.26E-02	2.87E-01	--	2.08E-01	7.12E-02
DBOIHWB	3.77E+00	3.17E+00	2.26E-02	2.87E-01	--	2.08E-01	7.12E-02
DBOIST1	2.36E+00	1.98E+00	1.41E-02	1.79E-01	--	1.30E-01	4.45E-02
GBOIHWE	6.47E-01	5.43E-01	3.88E-03	4.92E-02	--	3.56E-02	1.22E-02
GBOISB1	4.63E+00	7.77E+00	5.55E-02	7.03E-01	--	5.09E-01	1.75E-01
GBOISB2	4.63E+00	7.77E+00	5.55E-02	7.03E-01	--	5.09E-01	1.75E-01
GBOISB3	4.63E+00	7.77E+00	5.55E-02	7.03E-01	--	5.09E-01	1.75E-01
BEMGEN	2.87E-02	4.84E-02	7.65E-06	1.24E-04	--	3.85E-04	4.22E-04
CEMGENR	2.87E-02	4.84E-02	7.65E-06	1.24E-04	--	3.85E-04	4.22E-04
CEMGENS	1.20E+00	1.51E-01	4.76E-04	--	2.85E-02	6.25E-02	4.95E-04
DEMGEN	6.76E-02	1.14E-01	1.80E-05	2.91E-04	--	9.06E-04	9.92E-04
DMREMGEN	1.11E-01	1.72E-01	2.88E-05	4.65E-04	--	1.45E-03	1.59E-03
GEEMGEN	1.33E+00	2.04E-01	4.54E-04	--	3.60E-02	5.50E-02	4.72E-04
GOEMGEN	8.83E-01	6.85E-02	6.56E-04	--	2.15E-02	3.80E-02	6.82E-04
FAB 9 & FAB 10	--	--	--	--	--	3.25E+01	6.10E+00
FSCRUB1	--	--	--	--	5.35E-01	2.00E-01	0.00E+00
LS	--	--	--	--	2.66E+00	--	--
BCT1	--	--	--	--	1.55E+00	--	--
BCT2	--	--	--	--	3.56E-01	--	--
CCT1	--	--	--	--	1.33E+00	--	--
CCT2	--	--	--	--	6.63E-01	--	--
DCT1	--	--	--	--	1.48E+00	--	--
DCT2	--	--	--	--	7.41E-01	--	--
GCT1	--	--	--	--	4.98E+00	--	--
GCT2	--	--	--	--	4.98E+00	--	--
Total	35.53	39.25	0.28	3.48	19.35	35.40	6.97

AMBIENT IMPACT ASSESSMENT EMISSION INVENTORY FOR NEW MINOR FACILITIES AND MINOR MODIFICATIONS

PROPOSED EMISSIONS

		PM-10	PM-2.5		SO_2		NOx		CO		Lead	
		24-Hour Averaging Period	24-Hour Averaging Period	Annual Averaging Period	1-Hour Averaging Period	3-Hour Averaging Period	1-Hour Averaging Period	Annual Averaging Period	1-Hour Averaging Period	8-Hour Averaging Period	Monthly Averaging Period	Quarterly Averaging Period
Emission Unit	Stack ID	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr
ABOI	ABOI	--	6.65E-03	6.65E-03	5.25E-04	5.25E-04	8.75E-02	8.75E-02	7.35E-02	7.35E-02	--	--
BBOIHWB	BBOIHWB	--	6.55E-02	6.55E-02	5.17E-03	5.17E-03	8.61E-01	8.61E-01	7.24E-01	7.24E-01	--	--
BBOIST	BBOIST	--	5.73E-02	5.73E-02	4.52E-03	4.52E-03	7.54E-01	7.54E-01	6.33E-01	6.33E-01	--	--
CBOIHWB	CBOIHWB	--	6.55E-02	6.55E-02	5.17E-03	5.17E-03	8.61E-01	8.61E-01	7.24E-01	7.24E-01	--	--
DBOIHWB	DBOIHWB	--	6.55E-02	6.55E-02	5.17E-03	5.17E-03	8.61E-01	8.61E-01	7.24E-01	7.24E-01	--	--
DBOIST1	DBOIST1	--	4.09E-02	4.09E-02	3.23E-03	3.23E-03	5.38E-01	5.38E-01	4.52E-01	4.52E-01	--	--
GBOIHWE	GBOIHWE	--	1.12E-02	1.12E-02	8.86E-04	8.86E-04	1.48E-01	1.48E-01	1.24E-01	1.24E-01	--	--
GBOISB1	GBOISB1	--	1.61E-01	1.61E-01	1.27E-02	1.27E-02	1.06E+00	1.06E+00	1.77E+00	1.77E+00	--	--
GBOISB2	GBOISB2	--	1.61E-01	1.61E-01	1.27E-02	1.27E-02	1.06E+00	1.06E+00	1.77E+00	1.77E+00	--	--
GBOISB3	GBOISB3	--	1.61E-01	1.61E-01	1.27E-02	1.27E-02	1.06E+00	1.06E+00	1.77E+00	1.77E+00	--	--
BEMGEN	BEMGEN	--	1.03E-04	2.82E-05	1.53E-04	5.10E-05	5.75E-01	6.56E-03	9.68E-01	1.21E-01	--	--
CEMGENR	CEMGENR	--	1.03E-04	2.82E-05	1.53E-04	5.10E-05	5.75E-01	6.56E-03	9.68E-01	1.21E-01	--	--
CEMGENS	CEMGENS	2.38E-02	--	--	9.53E-03	3.18E-03	2.39E+01	2.73E-01	3.01E+00	3.76E-01	--	--
DEMGEN	DEMGEN	--	2.42E-04	6.64E-05	3.60E-04	1.20E-04	1.35E+00	1.54E-02	2.28E+00	2.85E-01	--	--
DMREMGEN	DMREMGEN	--	3.88E-04	1.06E-04	5.76E-04	1.92E-04	2.22E+00	2.54E-02	3.44E+00	4.30E-01	--	--
GEEMGEN	GEEMGEN	3.00E-02	--	--	9.08E-03	3.03E-03	2.65E+01	3.03E-01	4.07E+00	5.09E-01	--	--
GOEMGEN	GOEMGEN	1.79E-02	--	--	1.31E-02	4.38E-03	1.77E+01	2.02E-01	1.37E+00	1.71E-01	--	--
FAB 9 & FAB 10	HSCRUB7F2	--	--	--	--	--	--	--	--	--	--	--
FSCRUB1	FSCRUB1	1.22E-01	--	--	--	--	--	--	--	--		
LS	LS	2.53E-02	--	--	--	--	--	--	--	--	--	--
BCT1	BCT1	3.54E-01	--	--	--	--	--	--	--	--	--	--
BCT2	BCT2	1.62E-01	--	--	--	--	--	--	--	--	--	--
CCT1	CCT1	3.03E-01	--	--	--	--	--	--	--	--	--	--
CCT2	CCT2	3.03E-01	--	--	--	--	--	--	--	--	--	--
DCT1	DCT1	3.38E-01	--	--	--	--	--	--	--	--	--	--
DCT2	DCT2	3.38E-01	--	--	--	--	--	--	--	--	--	--
GCT1	GCT1	1.14E+00	--	--	--	--	--	--	--	--	--	--
GCT2	GCT2	1.14E+00	--	--	--	--	--	--	--	--	--	--

FACILITY WIDE HAZARDOUS AIR POLLUTANT POTENTIAL TO EMIT

HAP POTENTIAL TO EMIT EMISSIONS SUMMARY

Hazardous Air Pollutants	CAS #	PTE (FEC) (ton/yr)
Arsenic	7440-38-2	9.15E-05
Cadmium	7440-43-9	5.03E-04
Chromium	7440-47-3	6.41E-04
Cobalt	7440-48-4	3.84E-05
Hexane	110-54-3	8.24E-01
Manganese	7439-96-5	1.74E-04
Mercury	7439-97-6	1.19E-04
Nickel	7440-02-0	9.61E-04
Benzene	71-43-2	1.94E-03
Benzo(a)pyren	50-32-8	8.18E-07
Formaldehyde	50-00-0	3.66E-02
Naphthalene	91-20-3	4.26E-04
Toluene	108-88-3	1.91E-03
1,1,2,2-Tetrachloroethane	79-34-5	2.67E-06
1,1,2-Trichloroethane	79-00-5	1.62E-06
1,1-Dichloroethane	75-34-3	1.19E-06
1,2-Dichloropropane	78-87-5	1.37E-06
1,3-Butadiene	106-99-0	7.00E-05
1,3-Dichloropropene	542-75-6	1.34E-06
1.2-Dichloroethane	107-06-2	1.19E-06
Acetaldehyde	75-07-0	3.21E-04
Acrolein	107-02-8	2.86E-04
Carbon Tetrachloride	56-23-5	1.87E-06
Chlorobenzene	108-90-7	1.36E-06
Ethylene Dibromide	106-93-4	2.62E-06
Methanol	67-56-1	3.23E-04
Methylene Chloride	75-09-2	4.35E-06
PAHs	NA	1.01E-04
Styrene	100-42-5	1.26E-06
Vinyl Chloride	75-01-4	7.58E-07
xylene	1330-20-7	2.23E-04
4-methyl 2-pentanone	108-10-1	2.16E+00
Arsine	7784-42-1	7.54E-03
Catechol	120-80-9	4.10E-01
Chlorine	7782-50-5	0.00E+00
Chloroform	66-67-3	0.00E+00
Cresol	1319-77-3	9.98E-03
Ethlyene glycol	107-21-1	0.00E+00

HAP POTENTIAL TO EMIT EMISSIONS SUMMARY

Hazardous Air Pollutants	CAS #	PTE (FEC) (ton/yr)
Hydrofluoric acid	7664-39-3	2.40E+00
Hydrogen Chloride	7647-01-0	6.16E-01
Phosphine	7803-51-2	6.29E-03
propylene glycol monoethyl ether acetate	108-65-6	2.23E-01
propylene glycol monomethyl ether	107-98-2	2.67E-01
Total		6.97

TOXIC AIR POLLUTANT EMISSIONS INVENTORY

NON-CARCINOGENIC TAPS
CARCINOGENIC TAPS

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Department of Environmental Quality - Air Quality Division
Toxic Air Pollutant (TAP) Preconstruction Compliance Application Completeness Checklist

This checklist is designed to aid the applicant in submitting a complete preconstruction compliance demonstration for toxic air pollutants (TAPs) in permit to construct applications. The applicant must place a check mark in the box for each section below that applies.

I. Actions Needed Before Submitting Application

☒ Refer to the Rule. Read the Demonstration of Preconstruction Compliance with Toxic Standards contained in IDAPA 58.01.01.210 (Rules Section 210) Rules for the Control of Air Pollution in Idaho (Rules). Toxic air pollutants (TAPs) are regulated in accordance with Rules Section 210 only from emission units constructed or modified on or after July 1, 1995.

Determine if a new (constructed after June 30, 1995) emission unit has the potential to emit a TAP listed in IDAPA 58.01.01.585 (Rules Section 585) or IDAPA 58.0101.586 (Rules Section 586). Potential toxic air pollutants can be determined by reviewing commonly available emission factors, such as EPA's AP-42, or calculating emissions using a mass balance. For TAPs that are emitted but not listed in Rules Section 585 and 586, contact the Air Permit Hotline at 877-5PERMIT.

Determine if the proposed construction or modification is exempt from the need to obtain a permit to construct in accordance with IDAPA 58.01.01.220-223. Use the Exemption Criteria and Reporting Requirements for TAPs IDAPA 58.01.01.223 checklist to assist you in the exemption determination. If the source does not qualify for an exemption in accordance with IDAPA 58.01.01.220-223 complete the following checklist and submit it with the permit application. Please note that fugitive TAP emissions are not included in the IDAPA 58.01.01.223 exemption determination, but fugitive TAP emissions are included in the analysis if a permit is required. Stated another way: if a source is required to obtain a Permit to Construct because it does not meet the exemption criteria for any reason all TAP emissions, including fugitive TAPs, are included in the compliance demonstration in the application for the permit to construct. Should you have any questions regarding the fact that all TAPs, including fugitive TAPs, are included in the TAP preconstruction compliance demonstration submitted with a permit to construct application you may call the Air Permit Hotline at 877-5PERMIT.

Will the new or modified source result in new or increased potential emissions of TAPs?

☒ Yes. If yes, continue to section II.

☐ No. If no, no further action is required.

II. Application Content

If a new source has the potential to emit a TAP, or if a modification to an existing source increases the potential to emit of a TAP, then one of the following methods (A-J) of demonstrating TAP preconstruction compliance must be documented for each TAP. Standard methods are one of A-C. The applicant may also use one of the specialized methods in D-J. Fugitive TAP emissions shall be included in the analysis. The compliance methods are based on the requirements of Rules Section 210. Applicants are often able to demonstrate preconstruction TAP compliance using a combination of methods A and B.

Emission Calculations

Emissions calculation methodologies used are dependent on whether a specific TAP is a non-carcinogen or a carcinogen and whether the compliance method chosen from the list below calls

for controlled or uncontrolled emissions. Non-carcinogens are regulated based on a 24-hour averaging period and emission rates used for comparison to the non-carcinogen screening emissions level (EL) should be the maximum controlled or uncontrolled emissions quantity during any 24-hour period divided by 24. Carcinogens are regulated as a long term increment and emission rates used for comparison to the carcinogen EL should be the maximum controlled or uncontrolled emissions quantity during any 1 year period divided by 8760.

Modeling Analyses

Atmospheric dispersion modeling is required when controlled TAP emissions rates exceed ELs. Modeling analyses should be conducted in accordance with IDAPA 58.01.01.210.03. Quantification of Ambient Concentrations and the State of Idaho Air Quality Modeling Guideline (http;//www.deq.idaho.gov/air/data_reports/publications.cfm#model). For non-carcinogen 24-hour increments, compliance is demonstrated using the maximum modeled 24-hour-averaged concentration from available meteorological data (typically a five-year data set). For carcinogen long-term increments, compliance is demonstrated using the maximum modeled average concentration for the duration of the data set (one-year to five-year data set).

A submitted modeling report should clearly specify modeled emissions rates and results. All electronic model input files should be submitted, including BPIP input files.

Poly aromatic Hydrocarbons

Questions often arise regarding polyaromatic hydrocarbons as they are listed in Rules Section 586 of the Rules. The following two points are provided for clarification.

1) The following group of 7 PAH's (i.e. named POM), shall be combined and considered as one TAP equivalent in potency to benzo(a)pyrene:

   Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a, h) anthrancene, chrysene, indeno(1,2,3,-cd) pyrene, benzo (a) pyrene

2) All other PAH's are considered as a single pollutant and the emission of each is compared the PAH increment listed in Rules Section 586.

Compliance Methods

Fill in letter(s) (A-J) from the list below for TAP compliance demonstration method(s) used: _____.

A. TAPs Compliance Using Uncontrolled Emissions (Rules Section 210.05)

☐ Calculate the uncontrolled emissions (Rules Section 210.05) of each TAP from new emissions units. Uncontrolled emission rates are emissions at maximum capacity without the effect of physical or operational limitations. See Quantification of Emission Rates (Rules Section 210.02). Show calculations and state all assumptions.

☐ Calculate the increase of TAP emissions from modified emissions units. Show calculations and state all assumptions. The increase in emissions for a modified emission unit is determined by subtracting the potential to emit the TAP before the modification from the uncontrolled potential to emit after the modification. In conducting this analysis please note the following for TAP emission rate increase determinations:

Uncontrolled emission rates after the modification are emissions at maximum capacity without the effect of physical or operational limitations.

When determining the emissions increase from existing permitted emissions units the emission rate before the modification is equivalent to the emission limits contained in the permit for the

TAPs or, if there no emission limits in the permit, by determining what the emission rate is under the physical or operational limitations contained in the permit.

☐ Aggregate the uncontrolled emissions for each TAP from all new emissions units with the increase in emissions from all modified emissions units.

☐ If the aggregated emissions increase for each TAP from the new and modified units, as determined above, are less than or equal to the respective TAP screening emissions level (EL) then preconstruction compliance with toxic standards has been demonstrated and no further analysis is required. Submit a table comparing the uncontrolled emissions rate to the applicable EL.

If aggregated emissions are greater than the respective screening emissions level (EL) for any pollutants, use another compliance demonstration method for those pollutants, such as methods B, C, or D.

B. TAP Compliance Using Uncontrolled Ambient Concentration (Rules Section 210.06)

☐ Determine the uncontrolled emissions of each TAP from new emission units and the increase in emissions from all modified emissions units as described above in compliance Method A. Show calculations and state all assumptions.

☐ Model the uncontrolled emissions of each TAP from new emissions units and the increase in emissions from all modified emissions units.

☐ If the uncontrolled ambient concentration is less than or equal to the acceptable ambient concentration increment listed in Rules Section 585 and 586 no further procedures for demonstrating preconstruction compliance will be required for that TAP as part of the application process. Submit a table comparing uncontrolled ambient concentrations to the applicable acceptable ambient concentration.

C. TAP Compliance Using Controlled Ambient Concentrations (Rules Section 210.08)

☒ Determine the controlled emissions from new emissions units and the controlled emission increase from modified emissions units. Show all calculations and state all assumptions, including the control methods.

☒ Model the controlled emissions of each TAP from new emissions units and the increase in controlled emissions from all modified emissions units.

TAP emissions levels (EL) included in Rules Section 585 and 586 are derived based on generic modeling. If the sum the of emissions from new and modified sources is below the EL compliance is demonstrated without the need to conduct site-specific dispersion modeling.

☒ If the controlled ambient concentration from emission increases from new emissions units and modified emissions units is less than the applicable acceptable ambient concentration no further procedures for demonstrating preconstruction compliance are required.

☒ The Department shall include an emission limit for the TAP in the permit to construct that is equal to or, if requested by the applicant, less than the emission rate that was used in the modeling (Rules Section 210.08.c).

In some instances the Department may consider a throughput limit or other inherently-limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit.. Note that the applicant may model uncontrolled emissions as described in compliance Method B in an attempt to avoid TAPs emissions limitations.

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D. TAPs Compliance for NSPS and NESHAP Sources (Rules Section 210.20)

☐ If the owner or operator demonstrates that the TAP emissions from the source or modification is regulated by 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63, no further procedures for demonstrating preconstruction compliance will be required for that TAP.

☐ Provide a demonstration that the TAP is regulated under 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63. This demonstration must be specific for each TAP emitted.

E. TAP Compliance Using Net Emissions (Rules Section 210.09)

An applicant may use TAP net emissions to show preconstruction compliance; however this analysis may require more work than some of the others procedures available to demonstrate preconstruction compliance. When netting, all emissions increases and decreases of the TAP that have occurred within five years must be included in the analysis as described below.

☐ Determine the net emission increase for a TAP. A net emissions increase shall be an emission increase from a particular modification plus any other increase and decreases in actual emissions at the facility that are creditable and contemporaneous with particular modification (Rules Section 210.09). Show all calculations and state all assumptions.

☐ A creditable increase or decrease in actual emissions is contemporaneous with a particular modification if it occurs within five (5) years of the commencement of the construction or modification (Rules Section 210.09.a).

Actual emissions are (Rules Section 006.03):

- ☐ In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two year period which precedes the particular date and which is representative of normal source operation. The Department shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, productions rates, and types of materials processed, stored, or combusted during the selected time period.
- ☐ The Department may presume that the source-specific allowable emissions for the unit are equivalent to actual emissions of the unit.
- ☐ For any emission unit (except electric utility steam generating units) that has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

☐ Do not include emissions increases from emission units that have an uncontrolled emission rate that is 10% or less than the applicable screening emission level (EL) in Rules Section 585 and 586 (Rules Section 007.09.c.ii) and do not include emission increases from environmental remediation sources (Rules Section 007.09.c.iii). Show all calculations and state all assumptions.

☐ If the net emission increase is less than or equal to the applicable screening emissions level (EL) listed in Rules Section 585 and 586, no further procedures for demonstrating preconstruction compliance will be required (Rules Section 210.09.c).

☐ The Department shall include emission limits and other permit terms for the TAP in the permit to construct that will assure that the facility will be operated in the manner described in the preconstruction compliance demonstration (Rules Section 210.09.d).

In some instances the Department may consider a throughput limit or other inherently-limiting operational restriction in a permit as an effective emission limit for the TAP. rather than including a specific emission rate limit..

F. TAP Compliance Using Net Ambient Concentration (Rules Section 210.10)

☐ Determine the emission increase from the new source or modification, and all other creditable emission increases and decrease using the methods described above in compliance Method E.

☐ Model the emissions increases and decreases for each TAP. Modeling TAP decreases is accomplished by using negative valued emissions rates in the model input.

☐ If the net ambient concentration is less than or equal to the applicable ambient concentration increment listed in Rules Section 585 and 586, no further procedures for demonstrating preconstruction compliance are required.

☐ The Department shall include emission limits and other permit terms for the TAP in the permit to construct that will assure that the facility will be operated in the manner described in the preconstruction compliance demonstration (Rules Section 210.10.d).

In some instances the Department may consider a throughput limit or other inherently-limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit..

G. TAP Compliance Using T-RACT Ambient Concentration for Carcinogens (Rules Section 210.12)

The applicant may use T-RACT to demonstrate preconstruction compliance for TAPs listed in Rules Section 586 only.

T-RACT is an emissions standard based on the lowest emission of TAPs that a particular source is capable of meeting by application of control technology that is reasonably available, as determined by the Department, considering technological and economic feasibility. If control technology is not feasible, the emission standard may be based on the application of a design, equipment, work practice or operational requirement, or combination thereof (Rules Section 007.16).

T-RACT Submittal Requirements

☐ The applicant shall submit the following information to the Department identifying and documenting which control technologies or other requirements the applicant believes to be T-RACT (Rules Section 210.14).

The technical feasibility of a control technology or other requirements for a particular source shall be determined considering several factors including but not limited to:

- ☐ Process and operating procedures, raw materials and physical plant layout.
- ☐ The environmental impacts caused by the control technology that can not be mitigated, including but not limited to, water pollution and the production of solid wastes.
- ☐ The energy requirements of the control technology.

The economic feasibility of a control technology or other requirement, including the costs of necessary mitigation measures, for a particular source shall be determined considering several factors including, but not limited to:

- ☐ Capital costs.
- ☐ Cost effectiveness, which is the annualized cost of the control technology divided by the amount of emission reduction.
- ☐ The difference in costs between the particular source and other similar sources, if any, that have implemented emissions reductions.

☐ Compare the source's or modification's approved T-RACT ambient concentration to the applicable acceptable ambient concentration increment listed in Rules Section 586 multiplied by a factor of 10. If the sources approved T-RACT concentration is less than or equal to 10 times the applicable acceptable ambient concentration increment listed in Rules Section 586, no further procedures for demonstrating preconstruction compliance will be required.

☐ If an application is submitted to the Department without T-RACT and determined complete, and T-RACT is later determined to be applicable the completeness determination of the application will be revoked until a supplemental application is submitted and determined complete. When the supplemental application is determined complete, the timeline for agency action shall be reinitiated (Rules Section 210.13.b).

☐ If the Department determines that the source has proposed T-RACT, the Department shall develop emission standards to be incorporated into a permit to construct.

In some instances, the Department may consider a throughput limit or other inherently limiting operational restriction in a permit as an effective emission limit for the TAP, rather than including a specific emission rate limit..

H. TAP Compliance Using the Short Term Source Factor (Rules Section 210.15)

☐ For short term sources, the applicant may utilize a short term adjustment factor of ten (10) only for a carcinogenic pollutant listed in Rules Section 586. For a carcinogen listed in Rules Section 586 multiply either the applicable acceptable ambient concentration increment or the screening emission rate (EL), but not both, by ten (10) to demonstrate preconstruction compliance (Rules Section 210.15).

☐ A short term source is any new stationary source or modification to an existing source, with an operational life no greater than five (5) years from the inception of any operations to cessation of actual operations (Rules Section 210.15).

I. TAP Compliance for Environmental Remediation Sources (Rules Section 210.16)

☐ For remediation sources subject to or regulated by the Resource Conservation and Recovery Act and the Idaho Rules and Standard for Hazardous Waste, or the comprehensive Environmental Response, Compensation and Liability Act or a consent order, if the estimated ambient concentration is greater than the acceptable ambient impact increment listed in Rules Section 585 and 586, Best Available Control Technology shall be applied and operated until the estimated uncontrolled emission from the remediation source are below the applicable acceptable ambient concentration increment (Rules Section 210.16).

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J. TAP Compliance Using Offset Ambient Concentration (Rules Section 210.11)

☐ Contact the Department prior to proposing to utilize Offset Ambient Concentrations to demonstrate preconstruction compliance.

☐ Emission offsets must satisfy the requirements for emission reduction credits (Rules Section 460).

- The proposed level of allowable emissions must be less than the actual emissions of the emissions units providing the offsets (Rules Section 460.01).
- An air quality permit must be issued that restricts the potential to emit of the emission unit providing the offset.
- Emission reduction imposed by local, state or federal regulations or permits shall not be allowed.

☐ Compare the source's or modifications approved emission offset ambient concentration to the applicable acceptable ambient concentration listed in Rules Section 585 and 586. If the source's or modifications approved offset concentration is less than the acceptable ambient concentration listed in Rules Section 585 and 586, no further procedures for demonstrating preconstruction compliance will be required.

☐ The Department shall include emission limits and other permit terms for the TAP in the permit to construct that will assure that the facility will be operated in the manner described in the preconstruction compliance demonstration (Rules Section 210.10.d).

PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY

Non-Carcinogenic Toxic Air Pollutants	CAS #	Pre-Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (EL) (lb/hr)	Exceeds Screening Level
1,1-Dichloroethane	75-34-3	0.00E+00	9.94E-07	9.94E-07	2.70E+01	No
1,2-Dichloropropane	78-87-5	0.00E+00	1.14E-06	1.14E-06	2.31E+01	No
1.2-Dichloroethane	107-06-2	0.00E+00	9.94E-07	9.94E-07	2.67E+00	No
1-Methoxy-2-propanol	107-98-2	0.00E+00	5.09E-02	5.09E-02	2.40E+01	No
2-Heptanone	110-43-0	0.00E+00	4.48E-01	4.48E-01	1.57E+01	No
2-pentanone	107-87-9	0.00E+00	0.00E+00	0.00E+00	4.67E+01	No
4-methyl 2-pentanone	108-10-1	0.00E+00	4.11E-01	4.11E-01	1.37E+01	No
Acetic Acid	64-19-7	0.00E+00	2.85E-01	2.85E-01	1.67E+00	No
Acetone	67-64-1	0.00E+00	2.37E+00	2.37E+00	1.19E+02	No
Acrolein	107-02-8	0.00E+00	2.38E-04	2.38E-04	1.70E-02	No
Ammonia	7664-41-7	0.00E+00	3.52E-01	3.52E-01	1.20E+00	No
Arsine	7784-42-1	0.00E+00	1.44E-03	1.44E-03	1.30E-02	No
Barium	7440-39-3	0.00E+00	4.60E-04	4.60E-04	3.30E-02	No
Boron trifloride	7637-07-2	0.00E+00	2.14E-05	2.14E-05	2.00E-01	No
Calcium Hydroxide	1305-62-0	0.00E+00	5.23E-02	5.23E-02	3.33E-01	No
Catechol	120-80-9	0.00E+00	7.80E-02	7.80E-02	1.33E+00	No
Chlorine	7782-50-5	0.00E+00	0.00E+00	0.00E+00	2.00E-01	No
Chlorobenzene	108-90-7	0.00E+00	1.13E-06	1.13E-06	2.33E+01	No
Chromium	7440-47-3	0.00E+00	1.46E-04	1.46E-04	3.30E-02	No
Cobalt	7440-48-4	0.00E+00	8.78E-06	8.78E-06	3.30E-03	No
Copper	7440-50-8	0.00E+00	8.88E-05	8.88E-05	1.30E-02	No
Cresol	1319-77-3	0.00E+00	1.90E-03	1.90E-03	1.47E+00	No
Ethlyene glycol	107-21-1	0.00E+00	0.00E+00	0.00E+00	8.46E-01	No

PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY

Non-Carcinogenic Toxic Air Pollutants	CAS #	Pre-Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (EL) (lb/hr)	Exceeds Screening Level
ethyl alcohol	64-17-5	0.00E+00	6.20E-03	6.20E-03	1.25E+02	No
Hexane	110-54-3	0.00E+00	1.88E-01	1.88E-01	1.20E+01	No
Hydrogen Bromide	10035-10-6	0.00E+00	1.33E-02	1.33E-02	6.67E-02	No
Hydrogen Chloride	7647-01-0	0.00E+00	1.17E-01	1.17E-01	5.00E-02	Yes
Hydrogen Peroxide	7722-84-1	0.00E+00	5.44E-01	5.44E-01	1.00E-01	Yes
Isopropanol	67-63-0	0.00E+00	9.35E-01	9.35E-01	6.53E+01	No
Magnesium Hydroxide	546-93-0	0.00E+00	1.17E-01	1.17E-01	6.67E-01	No
Manganese	7439-96-5	0.00E+00	3.97E-05	3.97E-05	6.70E-02	No
Mercury	7439-97-6	0.00E+00	2.72E-05	2.72E-05	3.00E-03	No
Methanol	67-56-1	0.00E+00	2.69E-04	2.69E-04	1.73E+01	No
Molybdenum	7439-98-7	0.00E+00	1.15E-04	1.15E-04	6.67E-01	No
N-Amyl Acetate	628-63-7	0.00E+00	3.74E-03	3.74E-03	3.53E+01	No
Naphthalene	91-20-4	0.00E+00	1.86E-04	1.86E-04	3.33E+00	No
n-butyl acetate	123-86-4	0.00E+00	2.69E-02	2.69E-02	4.73E+01	No
n-butyl alcohol	71-36-3	0.00E+00	3.22E-03	3.22E-03	1.00E+01	No
Nitric Acid	7697-37-2	0.00E+00	2.17E-01	2.17E-01	3.33E-01	No
Nitrogen Trifluoride	7783-54-2	0.00E+00	5.36E-03	5.36E-03	1.93E+00	No
Nitrous oxide	10024-97-2	0.00E+00	8.86E-02	8.86E-02	6.00E+00	No
Pentane	109-66-0	0.00E+00	2.72E-01	2.72E-01	1.18E+02	No
Phosphine	7803-51-2	0.00E+00	1.20E-03	1.20E-03	2.70E-02	No
Phosphoric acid	7664-38-2	0.00E+00	3.01E-01	3.01E-01	6.70E-02	Yes
Phosphorus oxychloride	10025-87-3	0.00E+00	0.00E+00	0.00E+00	4.00E-02	No
Potassium Hydroxide	1310-58-3	0.00E+00	3.75E-04	3.75E-04	1.33E-01	No

PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY

Non-Carcinogenic Toxic Air Pollutants	CAS #	Pre-Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (EL) (lb/hr)	Exceeds Screening Level
propylene glycol monomethyl ether acetate	108-65-6	0.00E+00	4.24E-02	4.24E-02	2.40E+01	No
Silica, amorphous	112926-00-8	0.00E+00	3.71E-01	3.71E-01	6.67E-01	No
Silicon Dioxide	14808-60-7	0.00E+00	1.67E-02	1.67E-02	6.70E-03	Yes
Silicon tetrahydride	7803-62-5	0.00E+00	6.84E-02	6.84E-02	4.67E-01	No
Sodium Hydoxide	1310-73-2	0.00E+00	9.06E-03	9.06E-03	1.33E-01	No
Sodium Metabisulfite	7681-57-4	0.00E+00	1.23E-03	1.23E-03	3.33E-01	No
Styrene	100-42-5	0.00E+00	1.05E-06	1.05E-06	6.67E+00	No
Sulfuric acid	7664-93-9	0.00E+00	1.32E+00	1.32E+00	6.70E-02	Yes
Tetraethylorthosilicate	78-10-4	0.00E+00	6.66E-01	6.66E-01	5.67E+00	No
Toluene	108-88-3	0.00E+00	6.50E-04	6.50E-04	2.50E+01	No
Xylene	1330-20-7	0.00E+00	1.86E-04	1.86E-04	2.90E+01	No
Zinc	7440-66-6	0.00E+00	3.03E-03	3.03E-03	6.67E-01	No

PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT

Carcinogenic Toxic Air Pollutants	CAS #	Pre-Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hr Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (EL) (lb/hr)	Exceeds Screening Level
1,1,2,2-Tetrachloroethane	79-34-5	0.00E+00	6.10E-07	6.10E-07	1.10E-05	No
1,1,2-Trichloroethane	79-00-5	0.00E+00	3.69E-07	3.69E-07	4.20E-04	No
1,3-Butadiene	106-99-0	0.00E+00	1.60E-05	1.60E-05	2.40E-05	No
1,3-Dichloropropene	542-75-6	0.00E+00	3.06E-07	3.06E-07	1.90E-07	Yes
3-Methylcholanthrene	56-49-5	0.00E+00	1.88E-07	1.88E-07	2.50E-06	No
Acetaldehyde	75-07-0	0.00E+00	7.33E-05	7.33E-05	3.00E-03	No
Arsenic	7440-38-2	0.00E+00	2.09E-05	2.09E-05	1.50E-06	Yes
Benzene	71-43-2	0.00E+00	4.43E-04	4.43E-04	8.00E-04	No
Benzo(a)pyrene	50-32-8	0.00E+00	1.25E-07	1.25E-07	2.00E-06	No
Cadmium	7440-43-9	0.00E+00	1.15E-04	1.15E-04	3.70E-06	Yes
Carbon Tetrachloride	56-23-5	0.00E+00	4.27E-07	4.27E-07	4.40E-04	No
Chloroform	67-66-3	0.00E+00	3.30E-07	3.30E-07	2.80E-04	No
Ethylene Dibromide	106-93-4	0.00E+00	5.98E-07	5.98E-07	3.00E-05	No
Formaldehyde	50-00-0	0.00E+00	8.35E-03	8.35E-03	5.10E-04	Yes
Methylene Chloride	75-09-2	0.00E+00	9.93E-07	9.93E-07	1.60E-03	No
Nickel	7440-02-0	0.00E+00	2.19E-04	2.19E-04	2.70E-05	Yes
PAH	NA	0.00E+00	2.29E-05	2.29E-05	9.10E-05	No
Vinyl Chloride	75-01-4	0.00E+00	1.73E-07	1.73E-07	9.40E-04	No

MODELING INFORMATION

FORM MI1 – IMPACT ANALYSIS
FORM MI2 - POINT SOURCE STACK PARAMETERS
FORM MI4 - BUILDINGS AND STRUCTURES

FORM MI1 - IMPACT ANALYSIS

Modeling Information - Impact Analysis **Form MI1**

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	ON Semiconductor
Facility Name:	ON Semiconductor
Facility ID No.:	005-00017
Brief Project Description:	Semiconductor manufacturing facility

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour		5	76	68	144	150	96%
$PM_{2.5}$	24-hour		1.2	6.5	27.6	34	35	97%
	Annual		0.3	1.2	7.8	9	15	60%
SO_2	1-hr		7.8				196	
	3-hr		25				1300	
	24-hr		5				365	
	Annual		1				80	
NO_2	1-hr		7.5			148	188.7	78%
	Annual		1	12.1	12	24	100	24%
CO	1-hr		2000	457	15,600	16,057	40000	40%
	8-hr		500	132	5,200	5,332	10000	53%

FORM MI2 - POINT SOURCE STACK PARAMETERS

Modeling Information - Point Source Stack Parameters **Form MI2**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION
Revision 3
3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	ON Semiconductor
Facility Name:	ON Semiconductor
Facility ID No.:	005-00017
Brief Project Description:	Semiconductor manufacturing facility

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	Stack ID	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Modeled Diameter (m)	Stack Exit Temperature (K)	Stack Exit Flowrate (acfm)	Stack Exit Velocity (m/s)	Stack orientation (e.g., horizontal, rain cap)
Point Source(s)										
LS	LS	384557	4746710	1,444.47	11.28	0.50	293	500	1.22	Vertical
ABOI	ABOI	384624	4746870	1,439.56	4.8	0.46	389	1,800	5.17	Vertical, Rain cap
BBOIHWB	BBOIHWB	384592	4746760	1,444.81	11.3	0.51	389	1,800	4.19	Vertical, Rain cap
BBOIST	BBOIST	384596	4746767	1,444.60	13.0	0.51	419	3,300	7.68	Vertical
CBOIHWB	CBOIHWB	384556	4746749	1,442.66	13.7	0.56	394	2,400	4.62	Vertical
DBOIHWB	DBOIHWB	384514	4746722	1,440.28	13.7	0.56	366	2,400	4.62	Vertical
DBOIST1	DBOIST1	384514	4746718	1,440.40	14.0	0.41	491	2,250	8.19	Vertical
GBOIHWE	GBOIHWE	384519	4746574	1,446.80	8.5	0.31	389	400	2.59	Vertical, Rain cap
GBOISB1	GBOISB1	384529	4746589	1,447.29	9.6	0.51	450	4,050	9.43	Vertical, Rain cap
GBOISB2	GBOISB2	384530	4746581	1,447.66	9.6	0.51	450	4,050	9.43	Vertical, Rain cap
GBOISB3	GBOISB3	384533	4746581	1,447.93	9.6	0.51	450	4,050	9.43	Vertical, Rain cap
BCT1	BCT1	384604	4746761	1,445.65	4.3	2.54	291	9,124	0.85	Vertical
BCT2	BCT2	384612	4746765	1,446.24	4.7	2.13	291	8,317	1.10	Vertical
CCT1	CCT1	384589	4746741	1,445.73	5.0	2.54	291	14,681	1.37	Vertical
CCT2	CCT2	384598	4746736	1,446.82	5.0	2.54	291	12,030	1.12	Vertical
DCT1	DCT1	384520	4746711	1,441.30	5.6	3.05	291	12,305	0.80	Vertical
DCT2	DCT2	384534	4746711	1,442.69	5.6	3.05	291	12,305	0.80	Vertical
GCT1	GCT1	384561	4746599	1,449.40	7.9	3.35	291	23,193	1.24	Vertical
GCT2	GCT2	384557	4746607	1,448.78	7.9	3.35	291	23,193	1.24	Vertical
BEMGEN	BEMGEN	384606	4746772	1,445.07	10.4	0.05	894	160	46.00	Horizontal
CEMGENR	CEMGENR	384570	4746742	1,444.26	10.7	0.05	894	160	46.00	Vertical, Rain cap
CEMGENS	CEMGENS	384566	4746758	1,443.08	10.7	0.31	716	6,025	38.97	Vertical
DEMGEN	DEMGEN	384508	4746730	1,439.51	12.2	0.06	894	320	56.34	Vertical
DMREMGEN	DMREMGEN	384456	4746769	1,432.82	15.9	0.08	922	580	49.61	Vertical
GEEMGEN	GEEMGEN	384549	4746640	1,446.56	5.1	0.31	754	5,573	36.05	Vertical
GOEMGEN	GOEMGEN	384511	4746554	1,447.15	4.3	2.59	281	76,740	6.87	Vertical
FAB 9 & FAB 10	CEXHF1	384550	4746768	1,441.19	11.0	1.27	294	6,500	2.42	Vertical
FAB 9 & FAB 10	CEXHF5	384544	4746757	1,441.15	11.0	1.27	284	10,999	4.10	Vertical
FAB 9 & FAB 10	DEXHF8	384510	4746756	1,438.82	10.4	0.31	297	750	4.85	Vertical
FAB 9 & FAB 10	DEXHF15	384488	4746717	1,437.87	8.1	0.59	295	7,400	13.01	Vertical
FAB 9 & FAB 10	DEXHF16	384456	4746720	1,435.40	7.6	0.51	295	1,100	2.50	Vertical
FAB 9 & FAB 10	HPEXHF15	384505	4746606	1,444.29	23.7	0.56	289	3,100	5.97	Vertical
FAB 9 & FAB 10	HPEXHF16	384508	4746606	1,444.57	23.7	0.56	289	3,100	5.97	Vertical
FAB 9 & FAB 10	HSEXF5	384504	4746617	1,443.80	24.4	0.76	294	8,000	8.28	Vertical
FAB 9 & FAB 10	HSEXHF4	384500	4746621	1,443.26	24.4	0.76	294	7,957	8.28	Vertical
FAB 9 & FAB 10	HSEXHF17	384509	4746617	1,444.35	23.2	0.41	289	1,600	5.82	Vertical
FAB 9 & FAB 10	HSEXHF18	384510	4746617	1,444.48	23.2	0.41	289	1,600	5.82	Vertical
FAB 9 & FAB 10	DSCRUBF1	384538	4746733	1,442.00	13.1	1.27	284	30,000	11.18	Vertical
FAB 9 & FAB 10	DSCRUBF2	384538	4746735	1,441.88	13.1	1.27	284	30,000	11.18	Vertical
FAB 9 & FAB 10	DSCRUBF3	384538	4746733	1,442.00	13.1	1.27	284	30,000	11.18	Vertical
FAB 9 & FAB 10	DSCRUB5	384460	4746768	1,433.48	16.8	0.91	284	10,999	7.91	Vertical
FAB 9 & FAB 10	DSCRUB10	384469	4746716	1,436.39	14.9	0.51	283	6,500	15.14	Vertical
FAB 9 & FAB 10	DSCRUB14	384463	4746716	1,436.02	15.2	0.41	285	1,625	5.91	Vertical
BLDF	FSCRUB1	384569	4746723	1,444.86	8.4	0.51	281	3,200	7.45	Vertical

Modeling Information - Point Source Stack Parameters **Form MI2**

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	ON Semiconductor
Facility Name:	ON Semiconductor
Facility ID No.:	005-00017
Brief Project Description:	Semiconductor manufacturing facility

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
FAB 9 & FAB 10	HSCRUB1	384509	4746615	1,444.41	24.6	1.27	286	27,500	10.25	Vertical
FAB 9 & FAB 10	HSCRUB2	384511	4746620	1,444.36	24.6	1.27	286	31,000	11.55	Vertical
FAB 9 & FAB 10	HSCRUB3	384515	4746624	1,444.54	24.6	1.27	286	25,200	9.39	Vertical
FAB 9 & FAB 10	HSCRUB4	384515	4746630	1,444.33	24.6	1.27	286	31,000	11.55	Vertical
FAB 9 & FAB 10	HSCRUB7F1	384484	4746689	1,438.47	19.4	0.91	286	2,201	1.58	Vertical
FAB 9 & FAB 10	HSCRUB7F2	384482	4746689	1,438.19	19.4	0.91	287	2,201	1.58	Vertical

FORM MI4 - BUILDINGS AND STRUCTURES

Modeling Information - Buildings and Structures **Form MI4**

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	PERMIT TO CONSTRUCT APPLICATION Revision 3 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	ON Semiconductor
Facility Name:	ON Semiconductor
Facility ID No.:	005-00017
Brief Project Description:	Semiconductor manufacturing facility

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Building A	90.20	114.00	1443.00	12.01	1	Chemical warehouse
Building B	273.00	265.00	1445.00	6.71	1	Shipping and receiving
Building C	141.30	249.00	1444.00	6.71	1	Office space
Building D	159.50	225.25	1441.00	6.71	1	Fab 9
Building E	54.00	86.20	1450.00	6.71	1	Office space
Building F	90.75	75.20	1448.00	3.66	1	Waste water treatment system
Building G	47.20	218.00	1449.00	4.57	1	Utilities
Building H	361.83	310.67	1442.00		4	Fab10
Tier 1				9.75		
Tier 2				13.41		
Tier 3				20.12		
Tier 4				13.41		

Appendix C

Plot Plan

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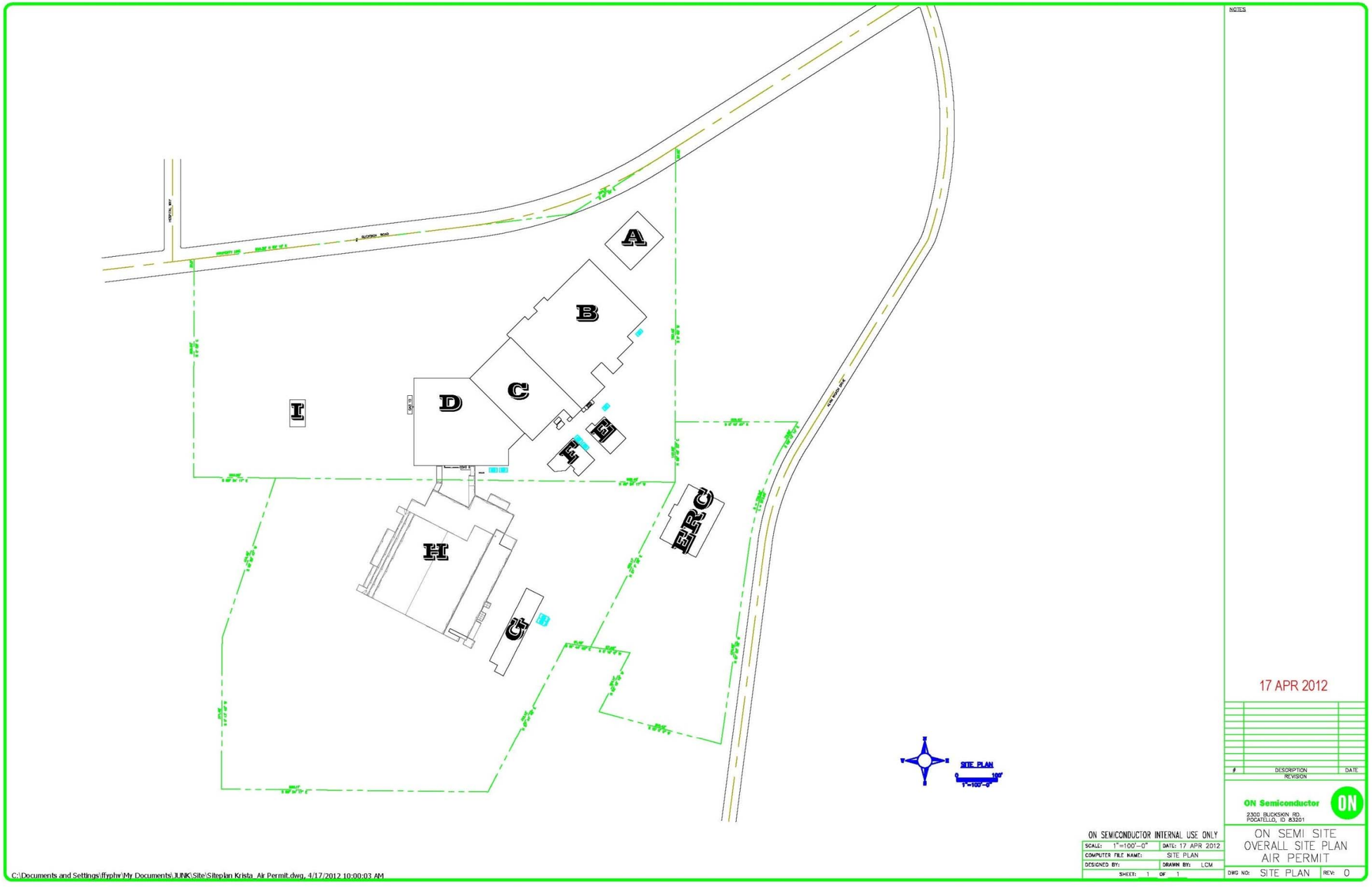
Plot Plan C-1

Sources North C-2

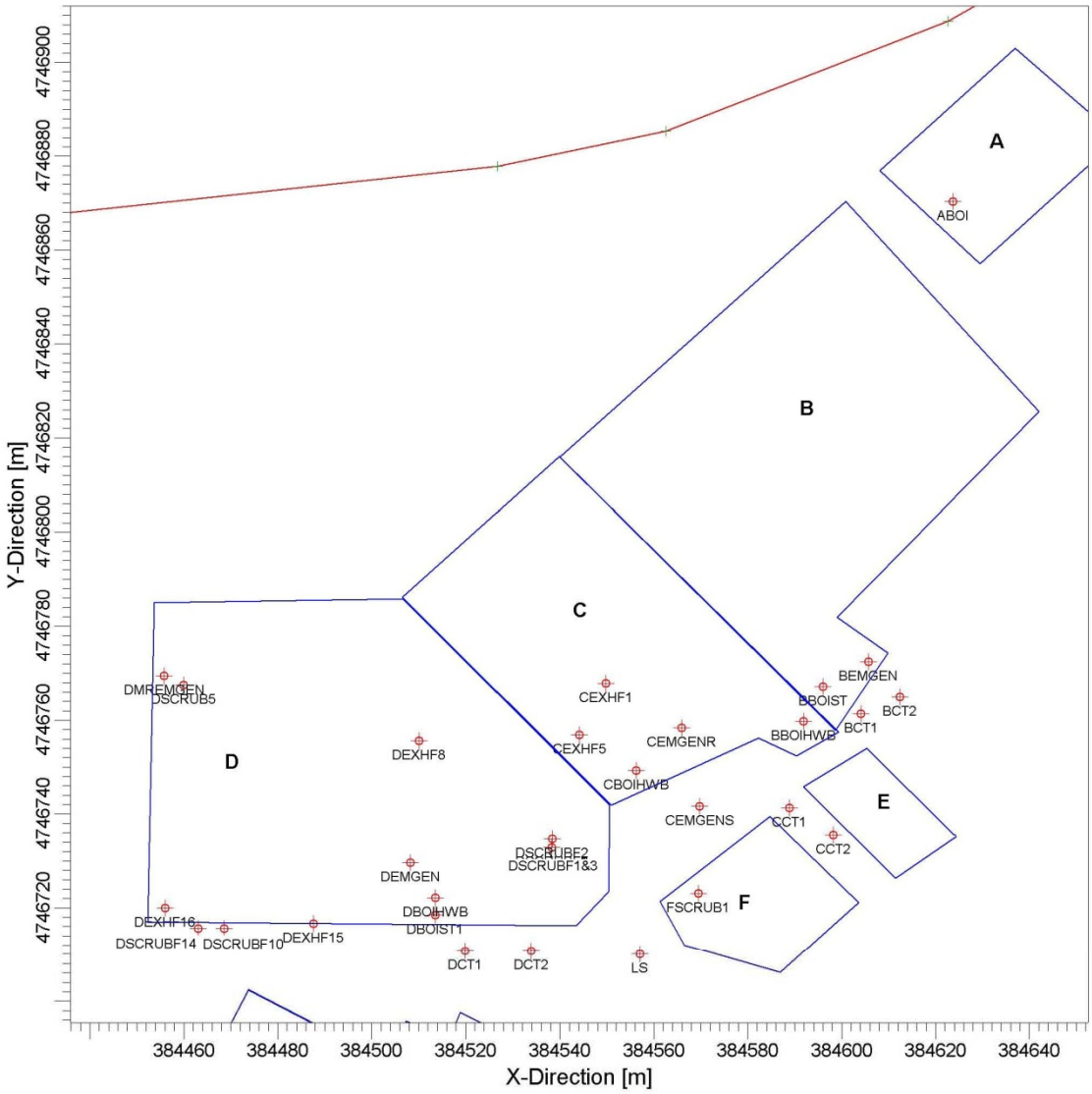
Sources South C-3

Plot Plan


A
B
C
D
E
F
G
H
I
HRC
SITE PLAN
NOTES
17 APR 2012
DESCRIPTION
REVISION
DATE
ON Semiconductor
2300 BUCKSKIN RD.
POCATELLO, ID 83201
ON SEMI SITE
OVERALL SITE PLAN
AIR PERMIT
DWG NO: SITE PLAN
REV: 0
ON SEMICONDUCTOR INTERNAL USE ONLY
SCALE: 1"=100'-0"
DATE: 17 APR 2012
COMPUTER FILE NAME: SITE PLAN
DESIGNED BY:
DRAWN BY: LCM
SHEET: 1 OF 1
C:\Documents and Settings\ffyphw\My Documents\JUNK\Site\Siteplan Krista_Air Permit.dwg, 4/17/2012 10:00:03 AM

Sources North

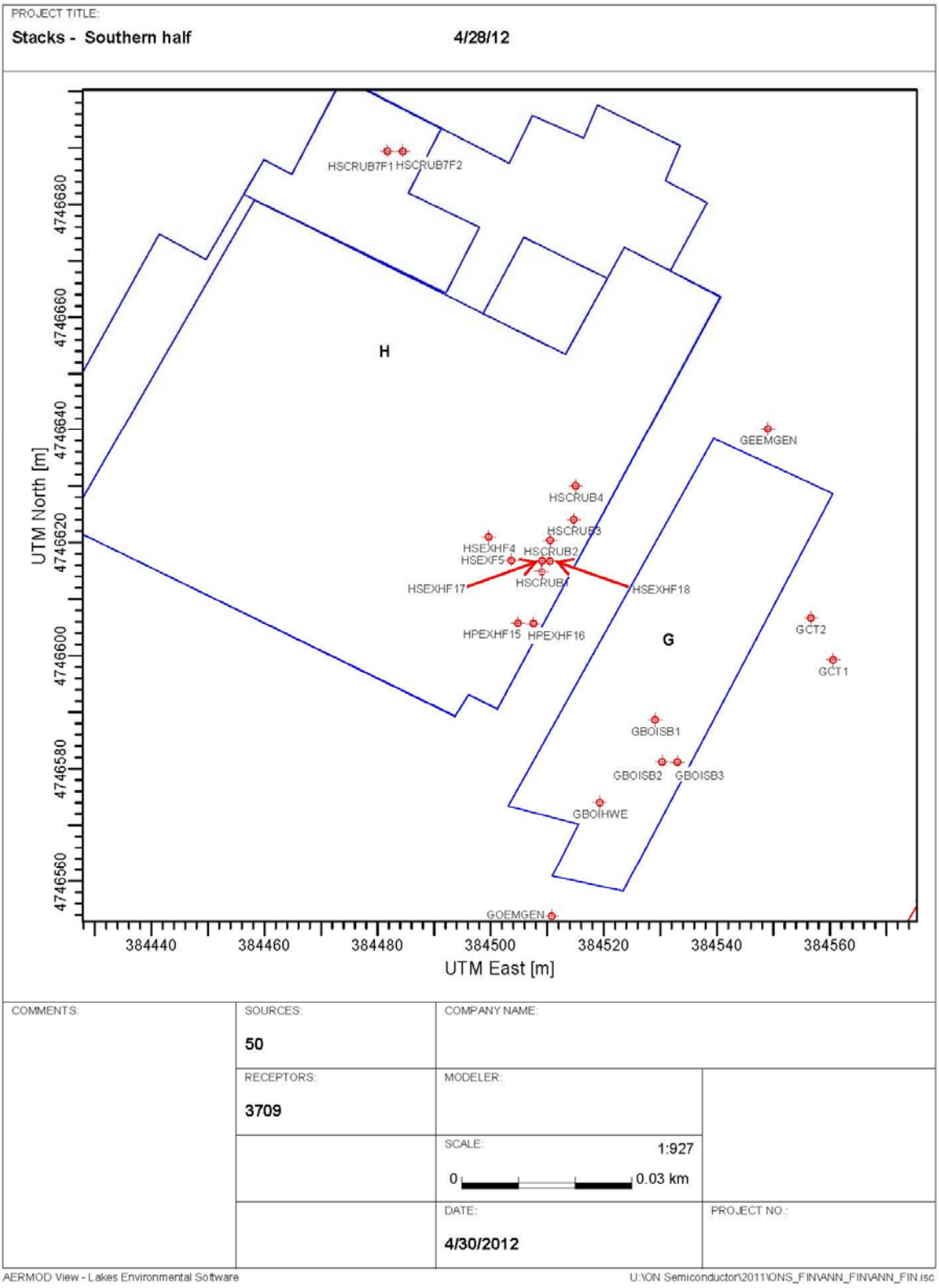
PROJECT TITLE:
Stacks - Northern half **7/13/12**



COMMENTS:	SOURCES: 50	COMPANY NAME:	
	RECEPTORS: 3709	MODELER:	
		SCALE: 1:1,362 (0 – 0.04 km)	
		DATE: 7/18/2012	PROJECT NO.:

AERMOD View - Lakes Environmental Software U:\ON Semiconductor\2012\1HR_FINAL\1HR_FINAL.isc

Sources South



Appendix D

Regulatory Applicability

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Federal Regulation Applicability D-1

40 CFR 60 Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units D-2

40 CFR 60 Subpart DDDDD—National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters D-6

40 CFR 60 Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines D-7

40 CFR 60 Subpart Q—National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers D-8

40 CFR 63 Subpart BBBBB—National Emission Standards for Hazardous Air Pollutants for Semiconductor Manufacturing D-9

40 CFR 63 Subpart JJJJ—Standards of Performance for Stationary Spark Ignition Internal Combustion Engines D-10

40 CFR 63 Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines D-12

IDAHO ADMINISTRATIVE CODE IDAPA 58.01.01 Department of Environmental Quality Rules for the Control of Air Pollution in Idaho D-51

Federal Regulation Applicability

NSPS/NESHAP Regulation Review and Applicability Form **FRA**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

AIR PERMIT APPLICATION

Revision 6
10/7/09

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
1. Company Name:	2. Facility Name:
ON Semiconductor	On Semiconductor
3. Brief Project Description:	Semiconductor manfuacturing facility

APPLICABILITY DETERMINATION	
4. List applicable subparts of the New Source Performance Standards (NSPS) (40 CFR part 60). Examples of NSPS affected emissions units include internal combustion engines, boilers, turbines, etc. The applicant must thoroughly review the list of affected emissions units.	List of applicable subpart(s): 40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. ☐ Not Applicable
5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR part 61 and 40 CFR part 63. Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. EPA has a web page dedicated to NESHAP that should be useful to applicants.	List of applicable subpart(s): 40 CFR 63 Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines ☐ Not Applicable
6. For each subpart identified above, conduct a complete a regulatory analysis using the instructions and referencing the example provided on the following pages. **Note** - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation applies. Regulatory reviews that are submitted with insufficient detail will be determined incomplete.	☑ A detailed regulatory review is provided (Follow instructions and example). ☐ DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date.

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

It is emphasized that it is the applicant's responsibility to satisfy all technical and regulatory requirements, and that DEQ will help the applicant understand what those requirements are prior to the application being submitted but that DEQ will not perform the required technical or regulatory analysis on the applicant's behalf.

40 CFR 60 Subpart Dc—Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Source: 72 FR 32759, June 13, 2007, unless otherwise noted.

Citation	Requirement	Applies	Explanation
60.40c	Applicability and delegation of authority.		
60.40c(a)	Except as provided in paragraphs (d), (e), (f), and (g) of this section, 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).	Yes	ON Semiconductor has 3 natural gas fired boilers that are rated for a maximum design heat input capacity of 10 MMBtu/hr and were constructed after June 9, 1989.
60.40c(b)	In delegating implementation and enforcement authority to a State under section 111(c) of the Clean Air Act, §60.48c(a)(4) shall be retained by the Administrator and not transferred to a State.	No	60.48c(a)(4) is not applicable to the ON boilers subject to this subpart.
60.40c(c)	Steam generating units that meet the applicability requirements in paragraph (a) of this section are not subject to the sulfur dioxide (SO_2) or particulate matter (PM) emission limits, performance testing requirements, or monitoring requirements under this subpart (§§60.42c, 60.43c, 60.44c, 60.45c, 60.46c, or 60.47c) during periods of combustion research, as defined in §60.41c.	No	ON does not perform any combustion research using its boilers.
60.40c(d)	Any temporary change to an existing steam generating unit for the purpose of conducting combustion research is not considered a modification under §60.14.	No	ON does not perform any combustion research using its boilers.
60.40c(e)	Heat recovery steam generators that are associated with combined cycle gas turbines and meet the applicability requirements of subpart KKKK of this part are not subject to this subpart. This subpart will continue to apply to all other heat recovery steam generators that are capable of combusting more than or equal to 2.9 MW (10 MMBtu/hr) heat input of fossil fuel but less than or equal to 29 MW (100 MMBtu/hr) heat input of fossil fuel. If the heat recovery steam generator is subject to this subpart, only emissions resulting from combustion of fuels in the steam generating unit are subject to this subpart. (The gas turbine emissions are subject to subpart GG or KKKK, as applicable, of this part).	No	ON does not utilize any combined cycle gas turbines and therefore subpart KKKK is not applicable.
60.40c(f)	Any facility covered by subpart AAAA of this part is not subject by this subpart.	No	ON is not subject to subpart AAAA, the NESHAP for Municipal Solid Waste Landfills
60.40c(g)	Any facility covered by an EPA approved State or Federal section 111(d)/129 plan implementing subpart BBBB of this part is not subject by this subpart.	No	ON is not subject to subpart BBBB, Emission Guidelines And Compliance Times For Small Municipal Waste Combustion Units

Citation	Requirement	Applies	Explanation
60.41c	Definitions. As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act and in subpart A of this part.	Yes	
60.42c	Standard for sulfur dioxide (SO_2).	No	The 3 ON facility boilers subject to Subpart Dc do not burn coal or fuel oil.
60.42c(a)-(j)	Except as provided in paragraphs (b), (c), and (e) of this section, on and after the date on which the performance test is completed or required to be completed under §60.8, whichever date comes first, the owner or operator of an affected facility that combusts only coal shall neither: cause to be discharged into the atmosphere from the affected facility any gases that contain SO_2in excess of 87 ng/J (0.20 lb/MMBtu) heat input or 10 percent (0.10) of the potential SO_2emission rate (90 percent reduction), nor cause to be discharged into the atmosphere from the affected facility any gases that contain SO_2in excess of 520 ng/J (1.2 lb/MMBtu) heat input. If coal is combusted with other fuels, the affected facility shall neither: cause to be discharged into the atmosphere from the affected facility any gases that contain SO_2in excess of 87 ng/J (0.20 lb/MMBtu) heat input or 10 percent (0.10) of the potential SO_2emission rate (90 percent reduction), nor cause to be discharged into the atmosphere from the affected facility any gases that contain SO_2in excess of the emission limit is determined pursuant to paragraph (e)(2) of this section.	No	The 3 ON facility boilers subject to Subpart Dc do not burn coal.
60.43c	Standard for particulate matter (PM).	No	The 3 ON facility boilers subject to Subpart Dc do not burn coal, fuel oil, or wood.
60.43c(a)-(e)	On and after the date on which the initial performance test is completed or required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005, that combusts coal or combusts mixtures of coal with other fuels and has a heat input capacity of 8.7 MW (30 MMBtu/hr) or greater, shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of the following emission limits:	No	The 3 ON facility boilers subject to Subpart Dc do not burn coal, fuel oil, or wood.
60.44c(a)-(f)	Compliance and performance test methods and procedures for sulfur dioxide.	No	60.42c is not applicable to the 3 ON facility boilers subject to Subpart Dc.
60.45c	Compliance and performance test methods and procedures for particulate matter.	No	60.43c is not applicable to the 3 ON facility boilers subject to Subpart Dc.

Citation	Requirement	Applies	Explanation
60.46c	Emission monitoring for sulfur dioxide.	No	60.42c is not applicable to the 3 ON facility boilers subject to Subpart Dc.
60.47c	Emission monitoring for particulate matter.	No	60.43c is not applicable to the 3 ON facility boilers subject to Subpart Dc.
60.48c	Reporting and recordkeeping requirements.		
60.48c(a)(1)-(4)	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:	Yes	ON shall submit design input heat capacity, fuel type, construction date, and start-up date for any new or reconstructed boilers installed or reconstructed after a permit has been issued. 60.48c(a)(2), (3), and (4) are not applicable to the ON boilers.
60.48c(b)	The owner or operator of each affected facility subject to the SO_2 emission limits of §60.42c, or the PM or opacity limits of §60.43c, shall submit to the Administrator the performance test data from the initial and any subsequent performance tests and, if applicable, the performance evaluation of the CEMS and/or COMS using the applicable performance specifications in appendix B of this part.	No	The ON boilers are not subject to the SO_2 emission limits.
60.48c(c)(1)-3)	In addition to the applicable requirements in §60.7, the owner or operator of an affected facility subject to the opacity limits in §60.43c(c) shall submit excess emission reports for any excess emissions from the affected facility that occur during the reporting period and maintain records according to the requirements specified in paragraphs (c)(1) through (3) of this section, as applicable to the visible emissions monitoring method used.	No	The ON boilers are not subject to the opacity limits.
60.48c(d)	The owner or operator of each affected facility subject to the SO_2 emission limits, fuel oil sulfur limits, or percent reduction requirements under §60.42c shall submit reports to the Administrator.	No	The ON boilers are not subject to the SO_2 emission limits.
60.48c(e)(1)-(11)	The owner or operator of each affected facility subject to the SO_2emission limits, fuel oil sulfur limits, or percent reduction requirements under §60.42c shall keep records and submit reports as required under paragraph (d) of this section, including the following information, as applicable.	No	The ON boilers are not subject to the SO_2 emission limits.
60.48c(f)(1)-(4)	Fuel supplier certification shall include the following information:	No	Fuel certification is not required because the ON boilers are not subject to 60.42c and 60.43c nor do they burn distillate oil, residual oil, or coal.

Citation	Requirement	Applies	Explanation
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.	No	ON requests to record fuel usage per 60.48c(g)(2).
60.48c(g)(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 SO_2standard, 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.	Yes	ON will continue to record and maintain records of the amount of fuel used by each boiler subject to this subpart per calendar month.
60.48c(g)(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 SO_2standard, 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.	No	ON is requesting meeting the reporting and recordkeeping requirements via 60.48c(g)(2).
60.48c(h)	The owner or operator of each affected facility subject to a federally enforceable requirement limiting the annual capacity factor for any fuel or mixture of fuels under §60.42c or §60.43c shall calculate the annual capacity factor individually for each fuel combusted. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of the calendar month.	No	The ON boiler is not subject to the federal enforceable opacity requirement for fuels under 60.42c and 60.43c.
60.48c(i)	All records required under this section shall be maintained by the owner or operator of the affected facility for a period of two years following the date of such record.	Yes	ON will maintain records for a minimum of two years.
60.48c(j)	The reporting period for the reports required under this subpart is each six-month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.	Yes	ON will report fuel usage as required per the permit.

40 CFR 60 Subpart DDDDD—National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

Source: 69 FR 55253, Sept. 13, 2004, unless otherwise noted.

Citation	Requirement	Applies	Explanation
63.7480	This subpart establishes national emission limits and work practice standards for hazardous air pollutants (HAP) emitted from industrial, commercial, and institutional boilers and process heaters. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limits and work practice standards.	No	
63.7485	You are subject to this subpart if you own or operate an industrial, commercial, or institutional boiler or process heater as defined in §63.7575 that is located at, or is part of, a major source of HAP as defined in §63.2 or §63.761 (40 CFR part 63, subpart HH, National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities), except as specified in §63.7491.	No	ON Semiconductor is not a major source for HAP as defined by 63.2 and 63.761.

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

Source: 71 FR 39172, July 11, 2006, unless otherwise noted.

Citation	Requirement	Applies	Explanation
60.4200(a)	The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) 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.	No	
60.4200(a)(1)	Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:	No	
60.4200(a)(1)(i)	2007 or later, for engines that are not fire pump engines,	No	ON Semiconductor does not have any CI ICE that are newer than 2007.
60.4200(a)(1)(ii)	The model year listed in table 3 to this subpart or later model year, for fire pump engines.	No	ON Semiconductor does not have any fire pump engines.
60.4200(a)(2)	Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:	No	
60.4200(a)(2)(i)	Manufactured after April 1, 2006 and are not fire pump engines, or	No	ON Semiconductor does not have any CI ICE that were manufactured after 2006.
60.4200(a)(2)(ii)	Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.	No	ON Semiconductor does not have any fire pump engines.
60.4200(a)(3)	Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.	No	ON Semiconductor does not have any stationary CI ICE that were modified or reconstructed after July 11, 2005.

40 CFR 60 Subpart Q—National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers

Source: 59 FR 46350, Sept. 8, 1994, unless otherwise noted.

Citation	Requirement	Applies	Explanation
60.400(a)	The provisions of this subpart apply to all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals and are either major sources or are integral parts of facilities that are major sources as defined in §63.401.	No	ON Semiconductor's cooling towers do not use chromium-based water treatment chemicals nor is it a major source.

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

Source: 68 FR 27925, May 22, 2003, unless otherwise noted.

Citation	Requirement	Applies	Explanation
63.7180	This subpart establishes national emission standards for hazardous air pollutants (NESHAP) for semiconductor manufacturing facilities. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission standards.		
63.7180(a)	You are subject to this subpart if you own or operate a semiconductor manufacturing process unit that is a major source of hazardous air pollutants (HAP) emissions or that is located at, or is part of, a major source of HAP emissions.	No	ON Semiconductor is a minor source of HAP emissions.
63.7180(b)	A major source of HAP emissions is any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit, considering controls, in the aggregate, any single HAP at a rate of 10 tons per year (tpy) or more or any combination of HAP at a rate of 25 tpy or more.	No	ON Semiconductor does not emit more than 10 tpy of any single HAP or more than 25 tpy of any combination of HAP.

40 CFR 63 Subpart JJJJ—Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Source: 73 FR 3591, Jan. 18, 2008, unless otherwise noted.

Citation	Requirement	Applies	Explanation
60.4230	Am I subject to this subpart?		
60.4230(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 (5) 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.	No	
60.4230(a)(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.	No	ON Semiconductor is not a manufacture of SI ICE.
60.4230(a)(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: 60.4230(a)(2)(i) On or after July 1, 2008; or 60.4230(a)(2)(ii) On or after January 1, 2009, for emergency engines.	No	ON Semiconductor is not a manufacture of SI ICE.
60.4230(a)(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:	No	ON Semiconductor is not a manufacture of SI ICE.
60.4230(a)(4)	Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:		
60.4230(a)(4)(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);	No	ON Semiconductor does not have any SI ICE manufactured after July 1, 2007.
60.4230(a)(4)(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;	No	ON Semiconductor does not have any SI ICE manufactured after January 1, 2008.
60.4230(a)(4)(iii)	on or after July 1, 2008, for engines with a maximum engine power less than 500 HP; or	No	ON Semiconductor does not have any SI ICE manufactured after July 1, 2007.

Citation	Requirement	Applies	Explanation
60.4230(a)(4)(iv)	on or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 HP).	No	ON Semiconductor does not have any SI ICE manufactured after January 1, 2009.
60.4230(a)(5)	Owners and operators of stationary SI ICE that commence modification or reconstruction after June 12, 2006.	No	ON Semiconductor does not have any SI ICE modified or reconstructed after June 12, 2006.

40 CFR 63 Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Source: 69 FR 33506, June 15, 2004, unless otherwise noted.

Citation	Requirement	Applies	Explanation
Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines			
63.6580	What is the purpose of subpart ZZZZ? Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.		
63.6585	Am I subject to this subpart? You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.	Yes	See subparagraphs
63.6585(a)	A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.	Yes	ON Semiconductor has seven stationary RICE.
63.6585(b)	A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.	No	ON Semiconductor is not a major source
63.6585(c)	An area source of HAP emissions is a source that is not a major source.	Yes	ON Semiconductor does not have the potential to emit more than 10 tpy of any single HAP or 25 tpy of any combination of HAPs and so is not a major source and is therefore an area source.

Citation	Requirement	Applies	Explanation
63.6585(d)	If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.	No	ON Semiconductor is already obtaining a permit.
63.6585(e)	If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.	No	ON Semiconductor does not use the RICE for national security purposes.
63.6590	What parts of my plant does this subpart cover? This subpart applies to each affected source.		
63.6590(a)	*Affected source.* An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.	Yes	ON Semiconductor has existing stationary RICE at an area source of HAP emissions.
63.6590(a)(1)	*Existing stationary RICE.*		
63.6590(a)(1)(i)	For stationary RICE with a site rating of more than 500 brake horsepower (HP) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.	No	ON Semiconductor is not a major source.
63.6590(a)(1)(ii)	For stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.	No	ON Semiconductor is not a major source.
63.6590(a)(1)(iii)	For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.	Yes	ON Semiconductor has 7 existing stationary RICE that commenced construction prior to June 12, 2006.
63.6590(a)(1)(iv)	A change in ownership of an existing stationary RICE does not make that stationary RICE a new or reconstructed stationary RICE.	No	

Citation	Requirement	Applies	Explanation
63.6590(a)(2)(i)	*New stationary RICE.* A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.	No	ON Semiconductor is not a major source.
63.6590(a)(2)(ii)	A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.	No	ON Semiconductor is not a major source.
63.6590(a)(2)(iii)	A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.	No	ON Semiconductor's 7 existing stationary RICE all commenced construction prior to June 12, 2006.
63.6590(a)(3)(i)	*Reconstructed stationary RICE.* A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after December 19, 2002.	No	ON Semiconductor is not a major source.
63.6590(a)(3)(ii)	A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.	No	ON Semiconductor is not a major source.
63.6590(a)(3)(iii)	A stationary RICE located at an area source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.	No	ON Semiconductor has not reconstruction any of the stationary RICE on or after June 12, 2006.
63.6590(b)(1)	*Stationary RICE subject to limited requirements.* (1) An affected source which meets either of the criteria in paragraphs (b)(1)(i) through (ii) of this section does not have to meet the requirements of this subpart and of subpart A of this part except for the initial notification requirements of §63.6645(f).	No	ON Semiconductor is not a major source.
63.6590(b)(1)(i)	The stationary RICE is a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.	No	ON Semiconductor is not a major source.
63.6590(b)(1)(ii)	The stationary RICE is a new or reconstructed	No	ON Semiconductor is not a major

Citation	Requirement	Applies	Explanation
	limited use stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.		source.
63.6590(b)(2)	A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis must meet the initial notification requirements of §63.6645(f) and the requirements of §§63.6625(c), 63.6650(g), and 63.6655(c). These stationary RICE do not have to meet the emission limitations and operating limitations of this subpart.	No	ON Semiconductor is not a major source.
63.6590(b)(3)	The following stationary RICE do not have to meet the requirements of this subpart and of subpart A of this part, including initial notification requirements:	No	See subparagraphs
63.6590(b)(3)(i)	Existing spark ignition 2 stroke lean burn (2SLB) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(b)(3)(ii)	Existing spark ignition 4 stroke lean burn (4SLB) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(b)(3)(iii)	Existing emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(b)(3)(iv)	Existing limited use stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(b)(3)(v)	Existing stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;	No	ON Semiconductor is not a major source.
63.6590(b)(3)(iv)	Existing residential emergency stationary RICE located at an area source of HAP emissions;	No	ON Semiconductor is not a residential area source.
63.6590(b)(3)(vii)	Existing commercial emergency stationary RICE located at an area source of HAP emissions; or	No	ON Semiconductor is not a commercial area source.
63.6590(b)(3)(vii)	Existing institutional emergency stationary RICE located at an area source of HAP emissions.	No	ON Semiconductor is not an institutional area source.

Citation	Requirement	Applies	Explanation
63.6590(c)	*Stationary RICE subject to Regulations under 40 CFR Part 60.* An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.	No	See subparagraph
63.6590(c)(1)	A new or reconstructed stationary RICE located at an area source;	No	ON Semiconductor's 7 existing stationary RICE all commenced construction prior to June 12, 2006.
63.6590(c)(2)	A new or reconstructed 2SLB stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(c)(3)	A new or reconstructed 4SLB stationary RICE with a site rating of less than 250 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(c)(4)	A new or reconstructed spark ignition 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(c)(5)	A new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;	No	ON Semiconductor is not a major source.
63.6590(c)(6)	A new or reconstructed emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;	No	ON Semiconductor is not a major source.
63.6590(c)(7)	A new or reconstructed compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.	No	ON Semiconductor is not a major source.
63.6595	When do I have to comply with this subpart?		
63.6595 (a)(1)	*Affected sources.* (1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the	Yes	ON Semiconductor is an area source with existing stationary CI and SI RICE. ON Semiconductor will comply with the operating limitations

Citation	Requirement	Applies	Explanation
	applicable emission limitations and operating limitations no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than May 3, 2013. If you have an existing stationary SI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary SI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than October 19, 2013.		described in Table 2d by May 3, 2013 for the CI engines and by October 19, 2013 for the SI engines.
63.6595(a)(2)	If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions before August 16, 2004, you must comply with the applicable emission limitations and operating limitations in this subpart no later than August 16, 2004.	No	ON Semiconductor is not a major source.
63.6595(a)(3)	If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions after August 16, 2004, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.	No	ON Semiconductor is not a major source.
63.6595(a)(4)	If you start up your new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions before January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart no later than January 18, 2008.	No	ON Semiconductor is not a major source.
63.6595(a)(5)	If you start up your new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions after January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.	No	ON Semiconductor is not a major source.

Citation	Requirement	Applies	Explanation
63.6595(a)(6)	If you start up your new or reconstructed stationary RICE located at an area source of HAP emissions before January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart no later than January 18, 2008.	No	ON Semiconductor is not a major source.
63.6595(a)(7)	If you start up your new or reconstructed stationary RICE located at an area source of HAP emissions after January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.	No	ON Semiconductor will not be starting up any new or reconstructed stationary RICE.
63.6595(b)	*Area sources that become major sources.* If you have an area source that increases its emissions or its potential to emit such that it becomes a major source of HAP, the compliance dates in paragraphs (b)(1) and (2) of this section apply to you.	No	Based on current regulations, ON Semiconductor does not anticipate becoming a major source.
63.6595(c)	If you own or operate an affected source, you must meet the applicable notification requirements in §63.6645 and in 40 CFR part 63, subpart A.	Yes	ON will meet the notification requirements in 63.6645 and Subpart A.
Emission and Operating Limitations			
63.6600	What emission limitations and operating limitations must I meet if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions? Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.	No	These requirements apply only to major sources, therefore, applicability is “no”
63.6601	What emission limitations must I meet if I own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP and less than or equal to 500 brake HP located at a major source of HAP emissions? Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart. If you own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to	No	These requirements apply only to major sources, therefore, applicability is “no”

Citation	Requirement	Applies	Explanation
	250 and less than or equal to 500 brake HP located at major source of HAP emissions manufactured on or after January 1, 2008, you must comply with the emission limitations in Table 2a to this subpart and the operating limitations in Table 2b to this subpart which apply to you.		
63.6602	What emission limitations must I meet if I own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions? If you own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions, you must comply with the emission limitations in Table 2c to this subpart which apply to you. Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.	No	These requirements apply only to major sources, therefore, applicability is "no"
63.6603	What emission limitations and operating limitations must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions? Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.	No	The *emission* limitations defined in 63.6620 and Table 4 are not applicable to existing stationary emergency RICE.
63.6603(a)	If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this subpart and the operating limitations in Table 2b to this subpart which apply to you.	Yes	ON will meet the requirements of Table 2d for all seven RICE. Table 2b is not applicable for existing stationary emergency RICE.
63.6603(b)	If you own or operate an existing stationary non-emergency CI RICE greater than 300 HP located at area sources in areas of Alaska not accessible by the Federal Aid Highway System (FAHS) you do not have to meet the numerical CO emission limitations specified in Table 2d to this subpart. Existing stationary non-emergency CI RICE greater than 300 HP located at area sources in areas of Alaska not accessible by the FAHS must meet the management practices that are shown for stationary non-emergency CI RICE less than or equal to 300 HP in Table 2d to this subpart.	No	

Citation	Requirement	Applies	Explanation
63.6604	What fuel requirements must I meet if I own or operate an existing stationary CI RICE? If you own or operate an existing non-emergency, non-black start CI stationary RICE with a site rating of more than 300 brake HP with a displacement of less than 30 liters per cylinder that uses diesel fuel, you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel. Existing non-emergency CI stationary RICE located in Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or at area sources in areas of Alaska not accessible by the FAHS are exempt from the requirements of this section.	No	ON Semiconductor does not use any non-emergency CI RICE. This requirement applies only to non-emergency RICE, and therefore, are not applicable.
General Compliance Requirements			
63.6605	What are my general requirements for complying with this subpart?		
63.6605(a)	You must be in compliance with the emission limitations and operating limitations in this subpart that apply to you at all times.	Yes	The *operating* limitations defined in the below subparagraph are applicable to ON Semiconductor.
63.6605(b)	At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.	Yes	ON Semiconductor will maintain operation and maintenance procedures, operation and maintenance records, and inspection records.
Testing and Initial Compliance Requirements			
63.6610	By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions? If you own or operate a stationary RICE with a site rating of more than 500 brake HP located at a	No	These requirements apply only to major sources, and therefore, are not applicable.

Citation	Requirement	Applies	Explanation
	major source of HAP emissions you are subject to the requirements of this section.		
63.6611	By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a new or reconstructed 4SLB SI stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions? If you own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions, you must conduct an initial performance test within 240 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions specified in Table 4 to this subpart, as appropriate.	No	These requirements apply only to major sources, therefore, applicability is "no"
63.6612	By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions? If you own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions you are subject to the requirements of this section.	No	ON Semiconductor is an area source with 7 existing stationary *emergency* RICE. Therefore, performance testing is not required.
63.6612(a)	You must conduct any initial performance test or other initial compliance demonstration according to Tables 4 and 5 to this subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).	No	On Semiconductor will comply with the operating limitations described in Table 2d by May 3, 2013 for the CI engines and by October 19, 2013 for the SI engines. Tables 4 and 5 are not applicable to ON's emergency RICE.
63.6612(b)	An owner or operator is not required to conduct an initial performance test on a unit for which a performance test has been previously conducted, but the test must meet all of the conditions described in paragraphs (b)(1) through (4) of this section.	No	

Citation	Requirement	Applies	Explanation
63.6615	When must I conduct subsequent performance tests? If you must comply with the emission limitations and operating limitations, you must conduct subsequent performance tests as specified in Table 3 of this subpart.	No	These requirements apply only to major sources and non-emergency RICE, therefore, applicability is "no"
63.6620	What performance tests and other procedures must I use?		
63.6620(a) – (h)	You must conduct each performance test in Tables 3 and 4 of this subpart that applies to you.	No	ON Semiconductor will comply with the operating limitations specified in Table 2d but there are no emissions limitations that apply to existing stationary emergency CI and SI RICE (see Table 4). This Subpart does not apply emission limits or reductions to area source stationary emergency CI and SI 4SRB that are <500hp (see Tables 1a, 1b, and 2a).
63.6625	What are my monitoring, installation, collection, operation, and maintenance requirements?		
63.6625(a)	If you elect to install a CEMS as specified in Table 5 of this subpart, you must install, operate, and maintain a CEMS to monitor CO and either oxygen or CO_2at both the inlet and the outlet of the control device according to the requirements in paragraphs (a)(1) through (4) of this section.	No	A CEMs will not be installed on any of the RICE.
63.6625(b)	If you are required to install a continuous parameter monitoring system (CPMS) as specified in Table 5 of this subpart, you must install, operate, and maintain each CPMS according to the requirements in paragraphs (b)(1) through (8) of this section.	No	A CPMS is not required to be installed as Table 5 is not applicable to the RICE installed at ON Semiconductor.
63.6625(c)	If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must monitor and record your fuel usage daily with separate fuel meters to measure the volumetric flow rate of each fuel. In addition, you must operate your stationary RICE in a manner which reasonably minimizes HAP emissions.	No	This requirement applies only to landfill gas or digester gas fired RICE, and therefore, is not applicable.

Citation	Requirement	Applies	Explanation
63.6625(d)	If you are operating a new or reconstructed emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions, you must install a non-resettable hour meter prior to the startup of the engine.	No	This requirement applies only to major sources, and therefore, is not applicable.
63.6625(e)	If you own or operate any of the following stationary RICE, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions:	Yes	ON Semiconductor will operate all 7 facility RICE in accordance with the manufactures maintenance and operating instructions.
63.6625(e)(1)	An existing stationary RICE with a site rating of less than 100 HP located at a major source of HAP emissions;	No	This requirement applies only to major sources, and therefore, in not applicable.
63.6625(e)(2)	An existing emergency or black start stationary RICE with a site rating of less than or equal to 500 HP located at a major source of HAP emissions;	No	This requirement applies only to major sources, and therefore, in not applicable.
63.6625(e)(3)	An existing emergency or black start stationary RICE located at an area source of HAP emissions;	Yes	ON Semiconductor has 7 stationary emergency RICE.
63.6625(e)(4)	An existing non-emergency, non-black start stationary CI RICE with a site rating less than or equal to 300 HP located at an area source of HAP emissions;	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(e)(5)	An existing non-emergency, non-black start 2SLB stationary RICE located at an area source of HAP emissions;	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(e)(6)	An existing non-emergency, non-black start landfill or digester gas stationary RICE located at an area source of HAP emissions;	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(e)(7)	An existing non-emergency, non-black start 4SLB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not

Citation	Requirement	Applies	Explanation
			applicable.
63.6625(e)(8)	An existing non-emergency, non-black start 4SRB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(e)(9)	An existing, non-emergency, non-black start 4SLB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year; and	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(e)(10)	An existing, non-emergency, non-black start 4SRB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year.	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(f)	If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.	Yes	ON Semiconductor has installed non-resettable hour meter on all of their RICE.
63.6625(g)	If you own or operate an existing non-emergency, non-black start CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (g)(2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska not accessible by the FAHS do not have to meet the requirements of paragraph (g) of this section.	No	This requirement applies only to non-emergency RICE. ON does not have any non-emergency RICE, and therefore, is not applicable.
63.6625(h)	If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup	Yes	ON Semiconductor will minimize idling time during engine startup to less than 30 min. Testing of the emergency engines are completed in 30 min.

Citation	Requirement	Applies	Explanation
	in Tables 1a, 2a, 2c, and 2d to this subpart apply.		
63.6625(i)	If you own or operate a stationary CI engine that is subject to the work, operation or management practices in items 1 or 2 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.	Yes	For the 3 CI RICE, ON Semiconductor will utilize the option of an oil analysis program in order to extend the specified oil change requirement in Table 2d to this subpart. The oil analysis will be performed at the same frequency specified for changing the oil in Table 2d to this subpart. The analysis program will, at a minimum, analyze the following three parameters: Total Base Number, viscosity, and percent water content.
63.6625(j)	If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the	No	For the 4 SI RICE, ON Semiconductor will implement the requirements established in Table 2d and will *not* utilize an oil analysis program.

Citation	Requirement	Applies	Explanation
	oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.		
63.6625(k) (1)-(4)	If you have an operating limitation that requires the use of a temperature measurement device, you must meet the requirements in paragraphs (k)(1) through (4) of this section.	No	None of the temperature limitations of this subpart apply to ONs RICE, since none of the RICE have catalysts.
63.6630	How do I demonstrate initial compliance with the emission limitations and operating limitations?		
63.6630(a)	You must demonstrate initial compliance with each emission and operating limitation that applies to you according to Table 5 of this subpart.	No	These requirements apply only to non-emergency RICE, and are therefore, not applicable.
63.6630(b)	During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this subpart that applies to you.	No	Performance test requirements are not applicable.
63.6630(c)	You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.	No	Per 63.66459(a)(5), ON Semiconductor only operates emergency RICE and none of them are subject to numerical emissions standards. Therefore, no notifications are required.
Continuous Compliance Requirements			
63.6635	How do I monitor and collect data to demonstrate continuous compliance?		
63.6635(a)	If you must comply with emission and operating limitations, you must monitor and collect data according to this section.	No	Per 63.6625, CEMS and CPMS are not required for ON Semiconductors 7 emergency generators.

Citation	Requirement	Applies	Explanation
63.6635(b)	Except for monitor malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), you must monitor continuously at all times that the stationary RICE is operating.	No	Per 63.6625, CEMS and CPMS are not required for ON Semiconductors 7 emergency generators.
63.6635(c)	You may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. You must, however, use all the valid data collected during all other periods.	No	Per 63.6625, CEMS and CPMS are not required for ON Semiconductors 7 emergency generators.
63.6640	How do I demonstrate continuous compliance with the emission limitations and operating limitations?		
63.6640(a)	You must demonstrate continuous compliance with each emission limitation and operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you according to methods specified in Table 6 to this subpart.	Yes	The operating limitations in Table 2d apply to the 7 ON facility RICE.
63.6640(b)	You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.	Yes	Deviations to the operating requirements will be reported per the requirements of the permit.
63.6640(c)	Reserved]		
63.6640(d)	For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a).	Yes	This will apply if ON rebuilds or reconstructs any of their existing stationary emergency RICE.
63.6640(e)	You must also report each instance in which you	Yes	Table 8 applies to all the ON

Citation	Requirement	Applies	Explanation
	did not meet the requirements in Table 8 to this subpart that apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at an area source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing emergency stationary RICE, an existing limited use stationary RICE, or an existing stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart, except for the initial notification requirements: a new or reconstructed stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new or reconstructed emergency stationary RICE, or a new or reconstructed limited use stationary RICE.		facility stationary emergency RICE with the exception, per 63.6645(a)(5), of the following: 63.7(b) and (c), 63.8(e), (f)(4), and (f)(6), and 63.9(b)-(e), (g) and (h). Table 8 in Subpart ZZZZ provides cross references to the applicable requirements of 40 CFR 63 Subpart A.
63.6640(f)	*Requirements for emergency stationary RICE.* (1) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed on or after June 12, 2006, or an existing emergency stationary RICE located at an area source of HAP emissions, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1)(i) through (iii) of this section. Any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1)(i) through (iii) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1)(i) through (iii) of this section, the engine will not be considered an emergency	Yes	ON Semiconductor operates 7 stationary RICE generators that meet the definition of emergency RICE.

Citation	Requirement	Applies	Explanation
	engine under this subpart and will need to meet all requirements for non-emergency engines.		
63.6640(f)(1)(i)	There is no time limit on the use of emergency stationary RICE in emergency situations.	Yes	ON Semiconductor will operate the emergency generators for as long as the facility deems necessary for production purposes, with a shutdown of production in a controlled manner that ensures worker and environmental safety.
63.6640(f)(1)(ii)	You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year.	Yes	ON Semiconductors emergency stationary RICE are operated for maintenance checks and readiness testing, as recommended by the manufacturer. Maintenance checks and readiness testing of each generator is limited to less than 100 hours per year.
63.6640(f)(1)(iii)	You may operate your emergency stationary RICE up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity; except that owners and operators may operate the emergency engine for a maximum of 15 hours per year as part of a demand response program if the regional transmission organization or equivalent balancing authority and transmission operator has determined there are emergency conditions that could lead to a potential electrical blackout, such as unusually low frequency, equipment overload, capacity or energy deficiency, or unacceptable voltage level. The engine may not be operated for more than 30 minutes prior to the time when the emergency condition is expected to occur, and the engine operation must be terminated immediately after the facility is notified that the emergency condition is no longer imminent. The 15 hours per	No	The 7 RICE are never operated in a non-emergency capacity except for the maintenance checks and readiness testing.

Citation	Requirement	Applies	Explanation
	year of demand response operation are counted as part of the 50 hours of operation per year provided for non-emergency situations. The supply of emergency power to another entity or entities pursuant to financial arrangement is not limited by this paragraph (f)(1)(iii), as long as the power provided by the financial arrangement is limited to emergency power.		
63.6640(f)(2)	If you own or operate an emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed prior to June 12, 2006, you must operate the engine according to the conditions described in paragraphs (f)(2)(i) through (iii) of this section. If you do not operate the engine according to the requirements in paragraphs (f)(2)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.	No	These requirements apply only to major sources, and therefore, are not applicable.
Notifications, Reports, and Records			
63.6645	What notifications must I submit and when?		
63.6645(a)	You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following;	No	See subparagraphs.
63.6645(a)(1)	An existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(a)(2)	An existing stationary RICE located at an area source of HAP emissions.	No	ON Semiconductor is an area source but only has *emergency* existing stationary RICE (see (a)(5)).
63.6645(a)(3)	A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(a)(4)	A new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 HP located at a major source of HAP emissions.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(a)(5)	This requirement does not apply if you own or operate an existing stationary RICE less than 100 HP, an existing stationary emergency RICE, or an	Yes	ON Semiconductor only operates emergency RICE and none of them are subject to numerical

Citation	Requirement	Applies	Explanation
	existing stationary RICE that is not subject to any numerical emission standards.		emissions standards. Therefore, no notifications are required.
63.6645(b)	As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart, you must submit an Initial Notification not later than December 13, 2004.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(c)	If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions on or after August 16, 2004, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(d)	As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart and you are required to submit an initial notification, you must submit an Initial Notification not later than July 16, 2008.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(e)	If you start up your new or reconstructed stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions on or after March 18, 2008 and you are required to submit an initial notification, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.	No	These requirements apply only to major sources, and therefore, are not applicable.
63.6645(f)	If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with §63.6590(b), your notification should include the information in §63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).	No	Per 63.6645(a)(5), ON Semiconductor is not affected by the requirements of this subpart.
63.6645(g)	If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).	No	Per 63.6612 and 63.6620, performance testing is not required for ON Semiconductors *emergency* RICE.
63.6645(h)	If you are required to conduct a performance test or other initial compliance demonstration as	No	Per 63.6612 and 63.6620, performance testing is not

Citation	Requirement	Applies	Explanation
	specified in Tables 4 and 5 to this subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).		required for ON Semiconductors *emergency* RICE.
63.6645(h)(1)	For each initial compliance demonstration required in Table 5 to this subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.	No	The requirements in Table 5 apply only to non-emergency RICE, and therefore, are not applicable.
63.6645(h)(2)	For each initial compliance demonstration required in Table 5 to this subpart that includes a performance test conducted according to the requirements in Table 3 to this subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).	No	The requirements in Table 5 apply only to non-emergency RICE, and therefore, are not applicable.
63.6650	What reports must I submit and when?		
63.6650(a - g)	You must submit each report in Table 7 of this subpart that applies to you.	No	The reporting requirements in Table 7 are for non-emergency RICE, and therefore, are not applicable.
63.6655	What records must I keep?		
63.6655(a)	If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.	Yes	See subparagraphs
63.6655(a)(1)	A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).	Yes	Records will be maintained of any reports provided to IDEQ as part of compliance with this subpart.
63.6655(a)(2)	Records of the occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or the air pollution control and monitoring equipment.	Yes	Records will be maintained of any malfunction of the emergency generators or monitoring equipment as part of compliance with this subpart.
63.6655(a)(3)	Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).	No	Per 63.6612 and 63.6620, performance tests are not required for the ON emergency RICE.

Citation	Requirement	Applies	Explanation
63.6655(a)(4)	Records of all required maintenance performed on the air pollution control and monitoring equipment.	No	The stationary emergency generators (e.g. RICE) do not utilize any air pollution control and/or monitoring equipment.
63.6655(a)(5)	Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.	Yes	Records will be maintained of any maintenance actions related to malfunctioning equipment as part of compliance with this subpart.
63.6655(b)	For each CEMS or CPMS, you must keep the records listed in paragraphs (b)(1) through (3) of this section.	No	CEMS and CPMS systems are not used on the stationary emergency generators (e.g. RICE).
63.6655(c)	If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must keep the records of your daily fuel usage monitors.	No	This requirement applies to landfill or digester gas combustion, and therefore, is not applicable.
63.6655(d)	You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.	Yes	ON Semiconductor will keep records for items 9 and 13 in Table 6 (see Table 6 for explanation).
63.6655(e)	You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE;	Yes	ON Semiconductor will keep records of all maintenance activities for the RICE per Table 2d.
63.6655(e)(1)	An existing stationary RICE with a site rating of less than 100 brake HP located at a major source of HAP emissions.	No	This requirement applies only to a major source, and therefore, is not applicable.
63.6655(e)(2)	An existing stationary emergency RICE.	Yes	See 63.6655(e)(3)
63.6655(e)(3)	An existing stationary RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart.	Yes	ON Semiconductor will keep records of all maintenance activities for the RICE per Table 2d.
63.6655(f)	If you own or operate any of the stationary RICE in paragraphs (f)(1) or (2) of this section, you must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document	Yes	ON Semiconductor will record how many hours are spent for emergency operation, including what classified the operation as emergency. The stationary,

Citation	Requirement	Applies	Explanation
	how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the owner or operator must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response.		existing 7 RICE meet the definition of emergency generators and are never operated in a non-emergency capacity except for the maintenance checks and readiness testing. Records of these operation times will be maintained.
63.6655(f)(1)	An existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions that does not meet the standards applicable to non-emergency engines.	No	This requirement applies only to a major source, and therefore, is not applicable.
63.6655(f)(2)	An existing emergency stationary RICE located at an area source of HAP emissions that does not meet the standards applicable to non-emergency engines.	Yes	The stationary, existing 7 RICE meet the definition of emergency generators and are never operated in a non-emergency capacity except for the maintenance checks and readiness testing.
63.6660	In what form and how long must I keep my records?		
63.6660(a)	Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).	Yes	ON Semiconductor will maintain suitable and readily available records.
63.6660(b)	As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.	Yes	ON Semiconductor will maintain required records for 5 years.
63.6660(c)	You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).	Yes	ON Semiconductor will maintain required records for 5 years.
Other Requirements and Information			
63.6665	What parts of the General Provisions apply to me? Table 8 to this subpart shows which parts of the General Provisions in §§63.1 through 63.15 apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or	Yes	ON Semiconductor operates *existing emergency* stationary RICE. Table 8 applies to all the ON facility stationary emergency RICE with the exception, per 63.6645(a)(5), of the following: 63.7(b) and (c), 63.8(e), (f)(4), and (f)(6), and 63.9(b)-(e), (g)

Citation	Requirement	Applies	Explanation
	reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at an area source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with any of the requirements of the General Provisions specified in Table 8: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing stationary RICE that combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, an existing emergency stationary RICE, or an existing limited use stationary RICE. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in the General Provisions specified in Table 8 except for the initial notification requirements: A new stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new emergency stationary RICE, or a new limited use stationary RICE.		and (h). Table 8 in Subpart ZZZZ provides cross references to the applicable requirements of 40 CFR 63 Subpart A.
63.6670	Who implements and enforces this subpart?		
63.6670(a)	This subpart is implemented and enforced by the U.S. EPA, or a delegated authority such as your State, local, or tribal agency. If the U.S. EPA Administrator has delegated authority to your State, local, or tribal agency, then that agency (as well as the U.S. EPA) has the authority to implement and enforce this subpart. You should contact your U.S. EPA Regional Office to find out whether this subpart is delegated to your State, local, or tribal agency.	Yes	EPA has delegated authority for this MACT subpart to IDEQ as part of the SIP.
63.6670(b - c)	In delegating implementation and enforcement authority of this subpart to a State, local, or tribal agency under 40 CFR part 63, subpart E, the authorities contained in paragraph (c) of this section are retained by the Administrator of the U.S. EPA and are not transferred to the State, local, or tribal agency.	Yes	This primarily refers to the authority to approve “alternatives” to the regulations.
63.6675	What definitions apply to this subpart? Terms used in this subpart are defined in the Clean Air Act (CAA); in 40 CFR 63.2, the General Provisions of this part; and in this section.	Yes	

Table 2bto Subpart ZZZZ of Part 63— Operating Limitations for New and Reconstructed 2SLB and Compression Ignition Stationary RICE >500 HP Located at a Major Source of HAP Emissions, New and Reconstructed 4SLB Stationary RICE ≥250 HP Located at a Major Source of HAP Emissions, Existing Compression Ignition Stationary RICE >500 HP, and Existing 4SLB Stationary RICE >500 HP Located at an Area Source of HAP Emissions

As stated in §§63.6600, 63.6601, 63.6630, and 63.6640, you must comply with the following operating limitations for new and reconstructed 2SLB and compression ignition stationary RICE located at a major source of HAP emissions; new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions; existing compression ignition stationary RICE >500 HP; and existing 4SLB stationary RICE >500 HP located at an area source of HAP emissions that operate more than 24 hours per calendar year:

For each . . .	You must meet the following operating limitation ...	Applies	Explanation
1. 2SLB and 4SLB stationary RICE and CI stationary RICE complying with the requirement to reduce CO emissions and using an oxidation catalyst; or 2SLB and 4SLB stationary RICE and CI stationary RICE complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and using an oxidation catalyst; or 4SLB stationary RICE and CI stationary RICE complying with the requirement to limit the concentration of CO in the stationary RICE exhaust and using an oxidation catalyst	a. maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and b. maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F.[1]	No	These requirements apply only to RICE with an oxidation catalyst. None of ON Semiconductor's stationary RICE have an oxidation catalyst, and therefore, this requirement is not applicable.
2. 2SLB and 4SLB stationary RICE and CI stationary RICE complying with the requirement to reduce CO emissions and not using an oxidation catalyst; or 2SLB and 4SLB stationary RICE and CI stationary RICE complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and not using an oxidation catalyst; or 4SLB stationary RICE and CI stationary RICE complying with the requirement to limit the concentration of CO in the stationary RICE exhaust and not using an oxidation catalyst.	Comply with any operating limitations approved by the Administrator.	No	ON Semiconductor has 3 existing CI Rice >500hp however, they are emergency RICE and therefore, this requirement is not applicable.

[1]Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.8(g) for a different temperature range.
[75 FR 51593, Aug. 20, 2010]

Table 2d to Subpart ZZZZ of Part 63— Requirements for Existing Stationary RICE Located at Area Sources of HAP Emissions

As stated in §§63.6603 and 63.6640, you must comply with the following requirements for existing stationary RICE located at area sources of HAP emissions.

For each . . .	You must meet the following requirement, except during periods of startup . . .	During periods of startup you must . . .	Applies	Explanation
1. Non-Emergency, non-black start CI stationary RICE ≤300 HP	a. Change oil and filter every 1,000 hours of operation or annually, whichever comes first;[1]	Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.	No	This requirement applies to non-emergency CI RICE, and therefore, is not applicable.
	b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;			
	c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.			
2. Non-Emergency, non-black start CI stationary RICE 300<HP≤500	a. Limit concentration of CO in the stationary RICE exhaust to 49 ppmvd at 15 percent O_2; or		No	This requirement applies to non-emergency CI RICE, and therefore, is not applicable.
	b. Reduce CO emissions by 70 percent or more.			
3. Non-Emergency, non-black start CI stationary RICE >500 HP	a. Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd at 15 percent O_2; or		No	This requirement applies to non-emergency CI RICE, and therefore, is not applicable.
	b. Reduce CO emissions by 70 percent or more.			

For each . . .	You must meet the following requirement, except during periods of startup . . .	During periods of startup you must . . .	Applies	Explanation
4. Emergency stationary CI RICE and black start stationary CI RICE.[2]	a. Change oil and filter every 500 hours of operation or annually, whichever comes first;[1]		Yes	ON Semiconductor has 3 existing CI stationary RICE.
	b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; and			
	c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.			
5. Emergency stationary SI RICE; black start stationary SI RICE; non-emergency, non-black start 4SLB stationary RICE >500 HP that operate 24 hours or less per calendar year; non-emergency, non-black start 4SRB stationary RICE >500 HP that operate 24 hours or less per calendar year.[2]	a. Change oil and filter every 500 hours of operation or annually, whichever comes first;[1]		Yes	ON Semiconductor has 4 existing emergency stationary SI RICE.
	b. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first; and			
	c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.			
6. Non-emergency, non-black start 2SLB stationary RICE	a. Change oil and filter every 4,320 hours of operation or annually, whichever comes first;[1]		No	This requirement applies to non-emergency RICE. ON Semiconductor does not have any non-emergency RICE, and therefore this requirement is not applicable.
	b. Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first; and			
	c. Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary.			

For each . . .	You must meet the following requirement, except during periods of startup . . .	During periods of startup you must . . .	Applies	Explanation
7. Non-emergency, non-black start 4SLB stationary RICE ≤500 HP	a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[1]		No	This requirement applies to non-emergency RICE. ON Semiconductor does not have any non-emergency RICE, and therefore this requirement is not applicable.
	b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first; and			
	c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.			
8. Non-emergency, non-black start 4SLB stationary RICE >500 HP	a. Limit concentration of CO in the stationary RICE exhaust to 47 ppmvd at 15 percent O_2; or		No	This requirement applies to non-emergency RICE. ON Semiconductor does not have any non-emergency RICE, and therefore this requirement is not applicable.
	b. Reduce CO emissions by 93 percent or more.			
9. Non-emergency, non-black start 4SRB stationary RICE ≤500 HP	a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[1]		No	This requirement applies to non-emergency RICE. ON Semiconductor does not have any non-emergency RICE, and therefore this requirement is not applicable.
	b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first; and			
	c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.			

For each . . .	You must meet the following requirement, except during periods of startup . . .	During periods of startup you must . . .	Applies	Explanation
10. Non-emergency, non-black start 4SRB stationary RICE >500 HP	a. Limit concentration of formaldehyde in the stationary RICE exhaust to 2.7 ppmvd at 15 percent O_2; or		No	This requirement applies to non-emergency RICE. ON Semiconductor does not have any non-emergency RICE, and therefore this requirement is not applicable.
	b. Reduce formaldehyde emissions by 76 percent or more.			
11. Non-emergency, non-black start landfill or digester gas-fired stationary RICE	a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[1]		No	This requirement applies to non-emergency RICE. ON Semiconductor does not have any non-emergency RICE, and therefore this requirement is not applicable.
	b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first; and			
	c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.			

[1]Sources have the option to utilize an oil analysis program as described in §63.6625(i) in order to extend the specified oil change requirement in Table 2d of this subpart.

[2]If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the management practice requirements on the schedule required in Table 2d of this subpart, or if performing the management practice on the required schedule would otherwise pose an unacceptable risk under Federal, State, or local law, the management practice can be delayed until the emergency is over or the unacceptable risk under Federal, State, or local law has abated. The management practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under Federal, State, or local law has abated. Sources must report any failure to perform the management practice on the schedule required and the Federal, State or local law under which the risk was deemed unacceptable.

[75 FR 51595, Aug. 20, 2010]

.Table 4 to Subpart ZZZZ of Part 63—Requirements for Performance Tests

As stated in §§63.6610, 63.6611, 63.6612, 63.6620, and 63.6640, you must comply with the following requirements for performance tests for stationary RICE:

For each . . .	Complying with the requirement to . . .	You must . . .	Using . . .	According to the following requirements . . .	Applies	Explanation
1. 2SLB, 4SLB, and CI stationary RICE	a. Reduce CO emissions	i. Measure the O_2at the inlet and outlet of the control device; and	(1) Portable CO and O_2analyzer	(a) Using ASTM D6522–00 (2005)[a](incorporated by reference, see §63.14). Measurements to determine O_2must be made at the same time as the measurements for CO concentration.	No	None of the numerical emission limitations listed in Tables 1a, 2a, 2c, and 2d apply to ON's 7 stationary, emergency RICE. Therefore, sampling for CO and/or Formaldehyde is not required.
		ii. Measure the CO at the inlet and the outlet of the control device	(1) Portable CO and O_2analyzer	(a) Using ASTM D6522–00 (2005)[ab](incorporated by reference, see §63.14) or Method 10 of 40 CFR appendix A. The CO concentration must be at 15 percent O_2, dry basis.		
2. 4SRB stationary RICE	a. Reduce formaldehyde emissions	i. Select the sampling port location and the number of traverse points; and	(1) Method 1 or 1A of 40 CFR part 60, appendix A §63.7(d)(1)(i)	(a) Sampling sites must be located at the inlet and outlet of the control device.	No	None of the numerical emission limitations listed in Tables 1a, 2a, 2c, and 2d apply to ON's 7 stationary, emergency RICE. Therefore, sampling for CO and/or Formaldehyde is not required.
		ii. Measure O_2at the inlet and outlet of the control device; and	(1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A, or ASTM Method D6522–00m (2005)	(a) Measurements to determine O_2concentration must be made at the same time as the measurements for formaldehyde concentration.		
		iii. Measure moisture content at the inlet and outlet of the control device; and	(1) Method 4 of 40 CFR part 60, appendix A, or Test Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348–03	(a) Measurements to determine moisture content must be made at the same time and location as the measurements for formaldehyde concentration.		
		iv. Measure formaldehyde at the inlet and the outlet of the control device	(1) Method 320 or 323 of 40 CFR part 63, appendix A; or ASTM D6348–03,[c]provided in ASTM D6348–03 Annex A5 (Analyte Spiking Technique), the percent R must be greater than or equal to 70 and less than or equal to 130	(a) Formaldehyde concentration must be at 15 percent O_2, dry basis. Results of this test consist of the average of the three 1-hour or longer runs.		

For each . . .	Complying with the requirement to . . .	You must . . .	Using . . .	According to the following requirements . . .	Applies	Explanation
3. Stationary RICE	a. Limit the concentration of formaldehyde or CO in the stationary RICE exhaust	i. Select the sampling port location and the number of traverse points; and	(1) Method 1 or 1A of 40 CFR part 60, appendix A §63.7(d)(1)(i)	(a) If using a control device, the sampling site must be located at the outlet of the control device.	No	None of the numerical emission limitations listed in Tables 1a, 2a, 2c, and 2d apply to ON's 7 stationary, emergency RICE. Therefore, sampling for CO and/or Formaldehyde is not required.
		ii. Determine the O_2concentration of the stationary RICE exhaust at the sampling port location; and	(1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A, or ASTM Method D6522–00 (2005)	(a) Measurements to determine O_2concentration must be made at the same time and location as the measurements for formaldehyde concentration.		
		iii. Measure moisture content of the stationary RICE exhaust at the sampling port location; and	(1) Method 4 of 40 CFR part 60, appendix A, or Test Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348–03	(a) Measurements to determine moisture content must be made at the same time and location as the measurements for formaldehyde concentration.		
		iv. Measure formaldehyde at the exhaust of the stationary RICE; or	(1) Method 320 or 323 of 40 CFR part 63, appendix A; or ASTM D6348–03,[c]provided in ASTM D6348–03 Annex A5 (Analyte Spiking Technique), the percent R must be greater than or equal to 70 and less than or equal to 130	(a) Formaldehyde concentration must be at 15 percent O_2, dry basis. Results of this test consist of the average of the three 1-hour or longer runs.		
		v. Measure CO at the exhaust of the stationary RICE	(1) Method 10 of 40 CFR part 60, appendix A, ASTM Method D6522–00 (2005),[a]Method 320 of 40 CFR part 63, appendix A, or ASTM D6348–03	(a) CO Concentration must be at 15 percent O_2, dry basis. Results of this test consist of the average of the three 1-hour longer runs.		

[a]You may also use Methods 3A and 10 as options to ASTM–D6522–00 (2005). You may obtain a copy of ASTM–D6522–00 (2005) from at least one of the following addresses: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959, or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106. ASTM–D6522–00 (2005) may be used to test both CI and SI stationary RICE.

[b]You may also use Method 320 of 40 CFR part 63, appendix A, or ASTM D6348–03.

[c]You may obtain a copy of ASTM–D6348–03 from at least one of the following addresses: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959, or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

[75 FR 51597, Aug. 20, 2010]

Table 6 to Subpart ZZZZ of Part 63—Continuous Compliance With Emission Limitations, Operating Limitations, Work Practices, and Management Practices

As stated in §63.6640, you must continuously comply with the emissions and operating limitations and work or management practices as required by the following:

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .	Applies	Explanation
1. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, and new or reconstructed non-emergency CI stationary RICE >500 HP located at a major source of HAP	a. Reduce CO emissions and using an oxidation catalyst, and using a CPMS	i. Conducting semiannual performance tests for CO to demonstrate that the required CO percent reduction is achieved;[a]and ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and iii. Reducing these data to 4-hour rolling averages; and iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.
		v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.		
2. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, and new r reco structed non-emergency CI stationary RICE >500 HP located at a major source of HAP	a. Reduce CO emissions and not using an oxidation catalyst, and using a CPMS	i. Conducting semiannual performance tests for CO to demonstrate that the required CO percent reduction is achieved;[a]and ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and iii. Reducing these data to 4-hour rolling averages; and iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test.	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.
3. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, new or	a. Reduce CO emissions and using a CEMS	i. Collecting the monitoring data according to §63.6625(a), reducing the measurements to 1-hour averages, calculating the percent reduction of CO emissions according to §63.6620; and ii. Demonstrating that the catalyst achieves the required percent reduction of CO emissions over the 4-hour averaging period; and	No	These requirements apply only to non-emergency RICE, and therefore, are not applicable.

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .	Applies	Explanation
reconstructed non-emergency stationary CI RICE >500 HP located at a major source of HAP, existing non-emergency stationary CI RICE >500 HP, existing non-emergency 4SLB stationary RICE >500 HP located at an area source of HAP that are operated more than 24 hours per calendar year		iii. Conducting an annual RATA of your CEMS using PS 3 and 4A of 40 CFR part 60, appendix B, as well as daily and periodic data quality checks in accordance with 40 CFR part 60, appendix F, procedure 1.		
4. Non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP	a. Reduce formaldehyde emissions and using NSCR	i. Collecting the catalyst inlet temperature data according to §63.6625(b); and ii. Reducing these data to 4-hour rolling averages; and	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.
		iii. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and		
		iv. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.		
5. Non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP	a. Reduce formaldehyde emissions and not using NSCR	i. Collecting the approved operating parameter (if any) data according to §63.6625(b); and ii. Reducing these data to 4-hour rolling averages; and	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.
		iii. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test.		
6. Non-emergency 4SRB stationary RICE with a brake HP ≥5,000 located at a major source of HAP	a. Reduce formaldehyde emissions	Conducting semiannual performance tests for formaldehyde to demonstrate that the required formaldehyde percent reduction is achieved.[a]	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .	Applies	Explanation
7. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP	a. Limit the concentration of formaldehyde in the stationary RICE exhaust and using oxidation catalyst or NSCR	i. Conducting semiannual performance tests for formaldehyde to demonstrate that your emissions remain at or below the formaldehyde concentration limit;[a] and ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.
		iii. Reducing these data to 4-hour rolling averages; and		
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and		
		v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.		
8. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP	a. Limit the concentration of formaldehyde in the stationary RICE exhaust and not using oxidation catalyst or NSCR	i. Conducting semiannual performance tests for formaldehyde to demonstrate that your emissions remain at or below the formaldehyde concentration limit;[a] and ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and	No	These requirements apply only to non-emergency RICE at major sources, and therefore, are not applicable.
		iii. Reducing these data to 4-hour rolling averages; and		
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test.		
9. Existing emergency and black start stationary RICE ≤500 HP located at a major source of HAP, existing non-emergency stationary RICE <100 HP located at a major source of HAP, existing	a. Work or Management practices	i. Operating and maintaining the stationary RICE according to the manufacturer's emission-related operation and maintenance instructions; or	Yes	ON Semiconductor has existing emergency … stationary RICE located at an area source of HAP.

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .	Applies	Explanation
emergency and black start stationary RICE located at an area source of HAP, existing non-emergency stationary CI RICE ≤300 HP located at an area source of HAP, existing non-emergency 2SLB stationary RICE located at an area source of HAP, existing non-emergency landfill or digester gas stationary SI RICE located at an area source of HAP, existing non-emergency 4SLB and 4SRB stationary RICE ≤500 HP located at an area source of HAP, existing non-emergency 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that operate 24 hours or less per calendar year		ii. Develop and follow your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.		
10. Existing stationary CI RICE >500 HP that are not limited use stationary RICE, and existing 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that operate more than 24 hours per calendar year and are not limited use stationary RICE	a. Reduce CO or formaldehyde emissions, or limit the concentration of formaldehyde or CO in the stationary RICE exhaust, and using oxidation catalyst or NSCR	i. Conducting performance tests every 8,760 hours or 3 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and	No	These requirements apply only to non-limited use RICE, therefore, applicability is “no”.
		ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and		
		iii. Reducing these data to 4-hour rolling averages; and		
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and		
		v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.		

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .	Applies	Explanation
11. Existing stationary CI RICE >500 HP that are not limited use stationary RICE, and existing 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that operate more than 24 hours per calendar year and are not limited use stationary RICE	a. Reduce CO or formaldehyde emissions, or limit the concentration of formaldehyde or CO in the stationary RICE exhaust, and not using oxidation catalyst or NSCR	i. Conducting performance tests every 8,760 hours or 3 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and	No	These requirements apply only to non-limited use RICE, therefore, applicability is "no"
		ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and		
		iii. Reducing these data to 4-hour rolling averages; and		
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test.		
12. Existing limited use CI stationary RICE >500 HP and existing limited use 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that operate more than 24 hours per calendar year	a. Reduce CO or formaldehyde emissions or limit the concentration of formaldehyde or CO in the stationary RICE exhaust, and using an oxidation catalyst or NSCR	i. Conducting performance tests every 8,760 hours or 5 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and	No	ON Semiconductor has 3 CI stationary RICE >500 hp and is an area source, however none of the CI RICE >500 hp have a oxidation catalyst.
		ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and		
		iii. Reducing these data to 4-hour rolling averages; and		
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and		

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .	Applies	Explanation
		v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test.		
13. Existing limited use CI stationary RICE >500 HP and existing limited use 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that operate more than 24 hours per calendar year	a. Reduce CO or formaldehyde emissions or limit the concentration of formaldehyde or CO in the stationary RICE exhaust, and using an oxidation catalyst or NSCR	i. Conducting performance tests every 8,760 hours or 5 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and	No	ON Semiconductor has 3 CI stationary RICE >500 hp, however these are emergency RICE not limited use RICE and therefore, this requirement is not applicable.
		ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and		
		iii. Reducing these data to 4-hour rolling averages; and		
		iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test.		

[a]After you have demonstrated compliance for two consecutive tests, you may reduce the frequency of subsequent performance tests to annually. If the results of any subsequent annual performance test indicate the stationary RICE is not in compliance with the CO or formaldehyde emission limitation, or you deviate from any of your operating limitations, you must resume semiannual performance tests.

[75 FR 51600, Aug. 20, 2010]

Table 7 to Subpart ZZZZ of Part 63—Requirements for Reports

As stated in §63.6650, you must comply with the following requirements for reports:

For each ...	You must submit a ...	The report must contain ...	You must submit the report ...	Applies	Explanation
1. Existing non-emergency, non-black start stationary RICE 100≤HP≤500 located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >500 HP located at a major source of HAP; existing non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >300 HP located at an area source of HAP; existing non-emergency, non-black start 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP and operated more than 24 hours per calendar year; new or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP; and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP	Compliance report	a. If there are no deviations from any emission limitations or operating limitations that apply to you, a statement that there were no deviations from the emission limitations or operating limitations during the reporting period. If there were no periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were not periods during which the CMS was out-of-control during the reporting period; or b. If you had a deviation from any emission limitation or operating limitation during the reporting period, the information in §63.6650(d). If there were periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), the information in §63.6650(e); or c. If you had a malfunction during the reporting period, the information in §63.6650(c)(4)	i. Semiannually according to the requirements in §63.6650(b)(1)–(5) for engines that are not limited use stationary RICE subject to numerical emission limitations; and ii. Annually according to the requirements in §63.6650(b)(6)–(9) for engines that are limited use stationary RICE subject to numerical emission limitations. i. Semiannually according to the requirements in §63.6650(b). i. Semiannually according to the requirements in §63.6650(b).	No	This requirement is for non-emergency RICE, and therefore, is not applicable.

For each ...	You must submit a ...	The report must contain ...	You must submit the report ...	Applies	Explanation
2. New or reconstructed non-emergency stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis	Report	a. The fuel flow rate of each fuel and the heating values that were used in your calculations, and you must demonstrate that the percentage of heat input provided by landfill gas or digester gas, is equivalent to 10 percent or more of the gross heat input on an annual basis; and	i. Annually, according to the requirements in §63.6650.	No	This requirement is for non-emergency RICE that combust landfill or digester gas, and therefore, is not applicable.
		b. The operating limits provided in your federally enforceable permit, and any deviations from these limits; and	i. See item 2.a.i.		
		c. Any problems or errors suspected with the meters.	i. See item 2.a.i.		

[75 FR 51603, Aug. 20, 2010]

IDAHO ADMINISTRATIVE CODE IDAPA 58.01.01 Department of Environmental Quality Rules for the Control of Air Pollution in Idaho

Citation	Requirement	Applies	Explanation
175	PROCEDURES AND REQUIREMENTS FOR PERMITS ESTABLISHING A FACILITY EMISSIONS CAP. The purpose of Sections 176 through 181 is to establish uniform procedures to obtain a Facility Emissions Cap (FEC) for stationary sources or facilities (hereinafter referred to as facility or facilities). A permit establishing a FEC will be issued pursuant to Sections 200 through 228 or Sections 400 through 410. (4-11-06)	Yes	ON is requesting a FEC permit pursuant to Sections 200 through 228.
176.01	Optional Facility Emissions Cap. An owner or operator of a facility may request a FEC to establish an enforceable facility-wide emission limitation. (4-11-06)	Yes	ON is requesting an FEC
176.02	Applicability		
176.02a	The owner or operator of any facility, which is not a major facility as defined in Sections 204 or 205, may apply to the Department for a permit to establish a FEC. (4-11-06)	Yes	ON is not a major facility and therefore, may request an FEC
176.02b	FECs are available to new sources, existing sources undergoing a modification, and existing sources that request a FEC. (4-11-06)	Yes	ON is an existing source
176.03a-f	Definitions. For the purposes of Sections 175 through 181, the following terms shall be defined as below. (4-11-06)	Yes	
177	APPLICATION PROCEDURES. In addition to the information required pursuant to Sections 202 or 402, whichever is applicable, applications requesting a FEC must include the information required under Sections 176 through 181 and Subsections 177.01 through 177.03. (4-11-06)		
177.01	Estimates of Emissions. A proposed FEC for each pollutant requested by the facility, including the basis for calculating the FEC. (4-11-06)	Yes	The application provides the basis for establishing the FEC
177.02	Estimates of Ambient Concentrations. (4-11-06)		
177.02a	Estimates of ambient concentrations will be based on the most recent applicable and technically appropriate methods and most representative data available to the Department unless otherwise approved by the Department. (4-11-06)	Yes	The application provides the data and methods for establishing the FEC
177.02b	Estimates of ambient concentrations may include projections of alternative future changes within the proposed FEC. (4-11-06)	Yes	Future changes are described in the application
177.02c	For a new, existing, or modified facility, a demonstration that for each FEC pollutant, the FEC will not cause or significantly contribute to a violation of any ambient air quality standard. (4-11-06)	Yes	The air dispersion modeling includes FEC quantities to demonstrate compliance.

Citation	Requirement	Applies	Explanation
177.02d	For renewal of terms and conditions establishing a FEC, it is presumed that the previous permitting analysis is satisfactory, unless the Department determines otherwise. (4-11-06)	Yes	
177.03	Monitoring and Recordkeeping. The application must include proposed means for the facility to determine facility emissions on a rolling twelve (12) month consecutive basis. (4-11-06)	Yes	The application describes the methodology for determining the annual facility emissions.
178	STANDARD CONTENTS OF PERMITS ESTABLISHING A FACILITY EMISSIONS CAP. In addition to the elements required by Sections 203 and 211 or Sections 403 and 405, whichever is applicable, the Department shall have the authority to impose, implement and enforce the terms in Subsections 178.01 through 178.05 and conditions establishing a FEC. (4-11-06)		
178.01	Emission Limitations and Standards. All permits establishing use of a FEC shall contain annual facility wide emissions limitations for each FEC pollutant. (4-11-06)	Yes	The application proposes annual FEC emission limits.
178.02	Monitoring. All permits establishing a FEC shall contain sufficient monitoring to ensure compliance with the FEC on a rolling twelve (12) month consecutive basis. (4-11-06)	Yes	The application proposes annual FEC pollutant monitoring.
178.03	Recordkeeping. All permits establishing a FEC shall include the following: (4-11-06)		
178.03a	Sufficient recordkeeping to assure compliance with the FEC.	Yes	ON will maintain records necessary to document FEC compliance
178.03b	Retention of required monitoring records and support information for a period of at least five (5) years from the date of the monitoring sample, measurement, report or application. Supporting information includes, but is not limited to, calibration and maintenance records and original strip-chart recordings for continuous monitoring instrumentation and copies of all reports required by the permit. (4-11-06)	Yes	ON will retain records in accordance with permit requirements.
178.04	Reporting. All permits establishing a FEC shall include the following: (4-11-06)		
178.04a	Sufficient reporting to assure compliance with the permit establishing the FEC. (4-11-06)	Yes	ON will report on FEC compliance per permit requirements.
178.04b	Submittal of an annual report each year on or before the anniversary date of permit issuance. All required reports must be certified in accordance with Section 123. (4-11-06)	Yes	ON will report on FEC compliance per permit requirements.

Citation	Requirement	Applies	Explanation
178.05	Duration. Each permit establishing a FEC shall state that the terms and conditions establishing the FEC are effective for a fixed term of five (5) years. (4-11-06)	Yes	
179	PROCEDURES FOR ISSUING PERMITS ESTABLISHING A FACILITY EMISSIONS CAP.		
179.01	General Procedures. Procedures for issuing permits establishing a FEC will follow Sections 209 or 404, whichever is applicable. (4-11-06)	Yes	Per IDEQ, Section 209 will be applicable to ON.
179.02	Renewal. The renewal of the terms and conditions establishing a FEC are subject to the same procedural requirements for issuing permits (Subsection 179.01) and Subsections 179.02.a. through 179.02.d.: (4-11-06)	Yes	
179.02a	The permittee shall submit a complete application to the Department for a renewal of the terms and conditions establishing the FEC at least six (6) months before, but no earlier than eighteen (18) months before, the expiration date of the existing permit. To ensure that the term of the permit does not expire before the terms and conditions are renewed, the permittee is encouraged to submit the application nine (9) months prior to expiration. (4-11-06)	Yes	
179.02b	If a timely and complete application for a renewal of the terms and conditions establishing the FEC is submitted, but the Department fails to issue or deny the renewal permit before the end of the term of the previous permit, then all the terms and conditions of the previous permit shall remain in effect until the renewal permit has been issued or denied. (4-11-06)	Yes	
179.02c	Expiration of the terms and conditions establishing a FEC may be grounds to terminate the facility's right to operate pursuant to Sections 176 through 181, unless a timely and complete renewal application has been submitted. (4-11-06)	Yes	
179.02d	On renewal, the Department may adjust a FEC with an unused growth component in accordance with the Idaho Environmental Protection and Health Act, Chapter 1, Title 39, Idaho Code, and these rules. (4-11-06)	Yes	
179.03	Reopening the FEC. The Department may reopen a FEC to: (4-11-06)		
179.03a	Reduce the FEC to reflect newly applicable federal requirements (for example, NSPS) with compliance dates after the issuance of the permit establishing the FEC. (4-11-06)	Yes	
179.03b	Reduce the FEC consistent with any other requirement that is enforceable as a practical matter, and that the state may impose on the facility under the Idaho Environmental Protection and Health Act, Chapter 1, Title 39, Idaho Code, and these rules. (4-11-06)	Yes	
179.04	FEC Termination. The Director may approve a revision of a permit establishing a FEC to terminate the FEC, provided the permittee complies with Subsections 209.04 or 404.04, as applicable, and Subsections 179.04.a. through 179.04.c.: (4-11-06)		
179.04a	The permittee may request a revision of the permit establishing the FEC to terminate the FEC at anytime prior to the expiration of the permit. The permittee is encouraged	Yes	

Citation	Requirement	Applies	Explanation
	to submit an application for a permit to construct or Tier I operating permit, as applicable, six (6) months prior to the time the permittee wishes to terminate the FEC. (4-11-06)		
179.04b	The FEC established in the permit shall remain in effect until the Department issues a new permit to construct or Tier I operating permit, as applicable. (4-11-06)	Yes	
179.04c	Nothing in Section 179 prohibits a permittee from requesting a permit revision to terminate the FEC during the permit renewal process. (4-11-06)	Yes	
180	REVISIONS TO PERMITS ESTABLISHING A FACILITY EMISSIONS CAP. Section 180 requires revisions to terms and conditions establishing a FEC. The permittee is exempt from Sections 200 through 228 unless the permittee chooses to use those rules to process any change to the permit, except as provided in Subsection 180.02. (4-11-06)	No	There is no existing FEC permit for ON Semiconductor. Future revisions to the permit will follow the requirements of Section 180.
181	NOTICE AND RECORD-KEEPING OF ESTIMATES OF AMBIENT CONCENTRATIONS. 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. (4-11-06)		
181.01	Notice. For facility changes that comply with the terms and conditions establishing the FEC, but are not included in the estimate of ambient concentration analysis approved for the permit establishing the FEC, the permittee shall review the estimate of ambient concentration analysis. (4-11-06)	Yes	For facility modifications not covered by the permit, ON will review the ambient concentration analysis.
181.01a	In the event that the facility change would result in a significant contribution above the design concentration determined by the estimate of ambient concentration analysis approved for the permit establishing the FEC, but does not cause or significantly contribute to a violation to any ambient air quality standard, the permittee shall provide notice to the Department in accordance with Subsection 181.01.b. (4-11-06)	Yes	Notice will be provided to IDEQ if any facility modification will exceed significant contribution above the analysis establishing the FEC.
181.01b	Notice procedures. The permittee may make a facility change under Section 181 if the permittee provides written notification to the Department so that the notification is received at least seven (7) days in advance of the proposed change or, in the event of an emergency, the permittee provides the notification so that it is received at least twenty-four (24) hours in advance of the proposed change. For each such change, the written notification shall: (4-11-06) i. Describe the proposed change; (4-11-06) ii. Describe and quantify expected emissions; and (4-11-06) iii. Provide the estimated ambient concentration analysis. (4-11-06)	Yes	For facility modifications that require notification, ON Semiconductor will provide notification at least 7 days prior to implementing the change.

Citation	Requirement	Applies	Explanation
181.02	Recordkeeping. For facility changes that comply with the terms and conditions establishing the FEC, but are not included in the estimate of ambient concentration analysis approved for the permit establishing the FEC, the permittee shall review the estimate of ambient concentration analysis. In the event the facility change would not result in a significant contribution above the design concentration determined by the estimate of ambient concentration analysis approved for the permit establishing the FEC, the permittee shall record and maintain documentation on-site of the review. (4-11-06)	Yes	ON Semiconductor will maintain records of all facility modification reviews.
181.03	Estimates of Ambient Concentrations. Estimates of ambient concentrations shall be consistent with the estimate of ambient concentration analysis approved for the permit establishing the FEC unless the Department determines that other technical methods are appropriate. The permittee shall include any changes to the facility that are not included in the originally approved estimate of ambient concentration analysis. (4-11-06)	Yes	The methodology established in the permit application will be used for future evaluations unless expressly requested otherwise by the IDEQ.
200	PROCEDURES AND REQUIREMENTS FOR PERMITS TO CONSTRUCT. The purposes of Sections 200 through 228 is to establish uniform procedures and requirements for the issuance of "Permits to Construct." As used throughout Sections 200 through 228 and 578 through 581, major facility shall be defined as major stationary source in 40 CFR 52.21(b), incorporated by reference into these rules at Section 107, and major modification shall be defined as in 40 CFR 52.21(b), incorporated by reference into these rules at Section 107. These CFR sections have been codified in the electronic CFR which is available at www.gpoaccess.gov/ecfr. (4-2-08)	Yes	Applicability of Sections 200 – 228 are addressed below.
201	PERMIT TO CONSTRUCT REQUIRED. No owner or operator may commence construction or modification of any stationary source, facility, major facility, or major modification without first obtaining a permit to construct from the Department which satisfies the requirements of Sections 200 through 228 unless the source is exempted in any of Sections 220 through 223, or the owner or operator complies with Section 213 and obtains the required permit to construct, or the owner or operator complies with Sections 175 through 181, or the source operates in accordance with all of the applicable provisions of a permit by rule.	Yes	On November 1, 2010 DEQ requested that ON submit a PTC.
202	APPLICATION PROCEDURES. Application for a permit to construct must be made using forms furnished by the Department, or by other means prescribed by the Department. The application shall be certified by the responsible official in accordance with Section 123 and shall be accompanied by all information necessary to perform any analysis or make any determination required under Sections 200 through 228. (7-1-02)	Yes	Applicable forms are attached to application.
202.01	Required Information. Depending upon the proposed size and location of the new or modified stationary source or facility, the application for a permit to construct shall include all of the information required by one or more of the following provisions: (5-1-94)	Yes	
202.01a	For any new or modified stationary source or facility: (5-1-94)		

Citation	Requirement	Applies	Explanation
202.01a.i	Site information, plans, descriptions, specifications, and drawings showing the design of the stationary source, facility, or modification, the nature and amount of emissions (including secondary emissions), and the manner in which it will be operated and controlled. (5-1-94)	Yes	Permit application contains facility description and emissions for this existing facility
202.01a.ii	A schedule for construction of the stationary source, facility, or modification. (5-1-94)	No	With a FEC, a construction schedule for modifications is not required.
202.01b (i, ii, iii, iv, and v)	For any new major facility or major modification in a nonattainment area which would be major for the nonattainment regulated air pollutant(s): (4-5-00)	No	ON is not a major facility
202.01c (i, ii, iii, iv, v, vi, vii, viii, ix, x, xi, and xii)	For any new major facility or major modification in an attainment or unclassifiable area for any regulated air pollutant. (4-6-05)	No	ON is not a major facility
202.02	Estimates of Ambient Concentrations. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). (4-5-00)	Yes	
202.02a	Where an air quality model specified in the "Guideline on Air Quality Models," is inappropriate, the model may be modified or another model substituted, subject to written approval of the Administrator of the U.S. Environmental Protection Agency and public comment pursuant to Subsection 209.01.c.; provided that modifications and substitutions of models used for toxic air pollutants will be reviewed by the Department. (4-5-00)	No	AEROMOD was used for modeling and is the EPA and DEQ recommended model
202.02b	Methods like those outlined in the U.S. Environmental Protection Agency's "Interim Procedures for Evaluating Air Quality Models (Revised)" (September 1984) should be used to determine the comparability of air quality models. (5-1-94)	No	No evaluation of models was conducted.
202.03	Additional Information. Any additional information, plans, specifications, evidence or documents that the Department may require to make the determinations required under Sections 200 through 225 shall be furnished upon request. (5-1-94)	Yes	ON will make every effort to submit additional requested information.
203	PERMIT REQUIREMENTS FOR NEW AND MODIFIED STATIONARY SOURCES. No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following: (5-1-94)		
203.01	Emission Standards. The stationary source or modification would comply with all applicable local, state or federal emission standards. (5-1-94)	Yes	The application demonstrates compliance with

Citation	Requirement	Applies	Explanation
			local, state and federal emissions standards.
203.02	NAAQS. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard. (5-1-94)	Yes	The application demonstrates compliance with NAAQS.
203.03	Toxic Air Pollutants. 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. (6-30-95)	Yes	The application demonstrates compliance with the TAPs listed in Section 585 and 586.
204	PERMIT REQUIREMENTS FOR NEW MAJOR FACILITIES OR MAJOR MODIFICATIONS IN NONATTAINMENT AREAS. New major facilities or major modifications proposed for location in a nonattainment area and which would be major for the nonattainment regulated air pollutant are considered nonattainment new source review (NSR) actions and are subject to the requirements in Section 204. Section 202 contains application requirements and Section 209 contains processing requirements for nonattainment NSR permitting actions. The intent of Section 204 is to incorporate the federal nonattainment NSR rule requirements. (4-6-05)	No	ON is not a major facility within a nonattainment area
205	PERMIT REQUIREMENTS FOR NEW MAJOR FACILITIES OR MAJOR MODIFICATIONS IN ATTAINMENT OR UNCLASSIFIABLE AREAS. The prevention of significant deterioration (PSD) program is a construction permitting program for new major facilities and major modifications to existing major facilities located in areas in attainment or in areas that are unclassifiable for any criteria air pollutant. Section 202 contains application requirements and Section 209 contains processing requirements for PSD permit actions. The intent of Section 205 is to incorporate the federal PSD rule requirements. (4-6-05)	No	ON is not a major facility within an attainment area
206	OPTIONAL OFFSETS FOR PERMITS TO CONSTRUCT. The owner or operator of any proposed new or modified stationary source, new major facility, or major modification, which cannot meet the requirements of Subsections 202.01.c.vi., 203.02, 203.03, 204.02.d., 205.01 (40 CFR 52.21(k)), and 209.02.b.vi., may propose the use of an emission offset in order to meet those requirements and thereby obtain a permit to construct. Any proposed emission offset must satisfy the requirements for emission reduction credits, Section 460, and demonstrate, through appropriate dispersion modeling, that the offset will reduce ambient concentrations sufficiently to meet the requirements at all modeled receptors which could not otherwise have met the requirements. (4-6-05)	No	ON is not proposing an emission offset
207	REQUIREMENTS FOR EMISSION REDUCTION CREDIT. In order to be credited in a permit to construct, any emission reduction credit must satisfy the requirements of Section 460. (5-1-94)	No	ON is not proposing an emission offset

Citation	Requirement	Applies	Explanation
208	DEMONSTRATION OF NET AIR QUALITY BENEFIT. The demonstration of net air quality benefit shall: (5-1-94)	No	ON is not proposing an emission offset for 208.01 VOCs, 208.02 Regulated Air Pollutants, or 2.8.03 Mobile Sources
209	PROCEDURE FOR ISSUING PERMITS.		
209.01	General Procedures. General procedures for permits to construct. (5-1-94)	Yes	
209.01a	Within thirty (30) days after receipt of the application for a permit to construct, the Department shall determine whether the application is complete or whether more information must be submitted and shall notify the applicant of its findings in writing. (5-1-94)	Yes	
209.01b	Within sixty (60) days after the application is determined to be complete the Department shall: (5-1-94)	Yes	
209.01b i	Upon written request of the applicant, provide a draft permit for applicant review. Agency action on the permit under this Section may be delayed if deemed necessary to respond to applicant comments. (4-5-00)	Yes	ON is requesting a copy of the draft permit
209.01b ii	Notify the applicant in writing of the approval, conditional approval, or denial of the application if an opportunity for public comment is not required pursuant to Subsection 209.01.c. The Department shall set forth reasons for any denial; or (5-1-94)	Yes	
209.01b iii	Issue a proposed approval, proposed conditional approval, or proposed denial. (5-1-94)	Yes	
209.01c	An opportunity for public comment will be provided on all applications requiring a permit to construct. Public comment shall be provided on an application for any new major facility or major modification, any new facility or modification which would affect any Class I area, any application which uses fluid modeling or a field study to establish a good engineering practice stack height pursuant to Sections 510 through 516, any application which uses an interpollutant trade pursuant to Subsection 210.17, any application which the Director determines an opportunity for public comment should be provided, and any application upon which the applicant so requests. (5-3-03)	Yes	
209.01c i	The Department's proposed action, together with the information submitted by the applicant and the Department's analysis of the information, shall be made available to the public in at least one (1) location in the region in which the stationary source or facility is to be located.	Yes	
209.01c ii	The availability of such materials shall be made known by notice published in a newspaper of general circulation in the county(ies) in which the stationary source or facility is to be located. (5-1-94)	Yes	
209.01c	A copy of such notice shall be sent to the applicant and to appropriate federal, state	Yes	

Citation	Requirement	Applies	Explanation
iii	and local agencies. (5-1-94)		
209.01c iv	There shall be a thirty (30) day period after initial publication for comment on the Department's proposed action, such comment to be made in writing to the Department. (5-1-94)	Yes	
209.01c v	After consideration of comments and any additional information submitted during the comment period, and within forty-five (45) days after initial publication of the notice, or notice of public hearing if one is requested under Subsections 209.02.b.iv. or 209.02.a.ii., unless the Director deems that additional time is required to evaluate comments and information received, the Department shall notify the applicant in writing of approval, conditional approval, or denial of the permit. The Department shall set forth the reasons for any denial. (5-1-94)	Yes	
209.01c vi	All comments and additional information received during the comment period, together with the Department's final determination, shall be made available to the public at the same location as the preliminary determination. (5-1-94)	Yes	
209.01d	A copy of each permit will be sent to the U.S. Environmental Protection Agency. (5-1-94)	Yes	
209.02 (a-b)	Additional Procedures for Specified Sources. (5-1-94)	No	ON is not a major facility within an attainment area
209.03	Establishing a Good Engineering Stack Height. The Department will notify the public of the availability of any fluid model or field study used to establish a good engineering practice stack height and provide an opportunity for a public hearing before issuing a permit or setting an emission standard based thereon. (5-1-94)	No	ON did not use modeling or field studies to establish existing stack heights. The application presents data showing that the ON stacks do not exceed GEP stack heights.
209.04	Revisions of Permits to Construct. The Director may approve a revision of any permit to construct provided the stationary source or facility continues to meet all applicable requirements of Sections 200 through 228. Revised permits will be issued pursuant to procedures for issuing permits (Section 209), except that the requirements of Subsections 209.01.c, 209.02.a, and 209.02.b, shall only apply if the permit revision results in an increase in emissions authorized by the permit or if deemed appropriate by the Director. (7-1-02)	No	There is no existing PTC permit for ON Semiconductor. Future revisions to the permit will follow the requirements of Section 180.
209.05	Permit to Construct Procedures for Tier I Sources. For Tier I sources that require a permit to construct, the owner or operator shall either: (5-1-94)	No	ON is not a major facility and does not meet the definition of a Tier I source.
209.06	Transfer of Permits to Construct. (4-11-06)		
209.06a	Transfers by Revision. A permit to construct may be transferred to a new owner or	Yes	As applicable

Citation	Requirement	Applies	Explanation
	operator in accordance with Subsection 209.04. (4-11-06)		
209.06b	Automatic Transfers. Any permit to construct, with or without transfer prohibition language, may be automatically transferred if: (4-11-06)	Yes	As applicable
209.06b i	The current permittee notifies the Department at least thirty (30) days in advance of the proposed transfer date; (4-11-06)	Yes	As applicable
209.06b ii	The notice provides written documentation signed by the current and proposed permittees containing a date for transfer of permit responsibility, designation of the proposed permittee's responsible official, and certification that the proposed permittee has reviewed and intends to operate in accordance with the permit terms and conditions; and (4-11-06)	Yes	As applicable
209.06b iii	The Department does not notify the current permittee and the proposed permittee within thirty (30) days of receipt of the notice of the Department's determination that the permit must be revised pursuant to Subsection 209.04. If the Department does not issue such notice, the transfer is effective on the date provided in the notice described in Subsection 209.06.b.ii. (4-11-06)	Yes	As applicable
210	DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS. In accordance with Subsection 203.03, the applicant shall demonstrate preconstruction compliance with Section 161 to the satisfaction of the Department. The accuracy, completeness, execution and results of the demonstration are all subject to review and approval by the Department. (6-30-95)	Yes	Although ON Semiconductor is an existing facility, compliance with toxic standards was determined as applicable and is presented in the application.
210.01	Identification of Toxic Air Pollutants. The applicant may use process knowledge, raw materials inputs, EPA and Department references and commonly available references approved by EPA or the Department to identify the toxic air pollutants emitted by the stationary source or modification. (6-30-95)	Yes	
210.02	Quantification of Emission Rates. (6-30-95)		
210.02a	The applicant may use standard scientific and engineering principles and practices to estimate the emission rate of any toxic air pollutant at the point(s) of emission. (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.
210.02a i	Screening engineering analyses use unrefined conservative data. (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.
210.02a ii	Refined engineering analyses utilize refined and less conservative data including, but not limited to, emission factors requiring detailed input and actual emissions testing at a comparable emissions unit using EPA or Department approved methods. (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.

Citation	Requirement	Applies	Explanation
210.02b	The uncontrolled emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design without the effect of any physical or operational limitations. (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.
210.02b i	Examples of physical and operational design include but are not limited to: the amount of time equipment operates during batch operations and the quantity of raw materials utilized in a batch process. (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.
210.02b ii	Examples of physical or operational limitations include but are not limited to: shortened hours of operation, use of control equipment, and restrictions on production which are less than design capacity. (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.
210.02c	The controlled emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design with the effect of any physical or operational limitation that has been specifically described in a written and certified submission to the Department. (6-30-95)	Yes	Appropriate physical and operational design considerations were factored into the TAP estimates and are defined in the application.
210.02d	The T-RACT emissions rate of a toxic air pollutant from a source or modification is calculated using the maximum capacity of the source or modification under its physical and operational design with the effect of: (6-30-95)	No	TAP emission estimates were determined based on Section 210.02c.
210.03	Quantification of Ambient Concentrations. (6-30-95)		
210.03a	The applicant may use the modeling methods provided in Subsection 202.02 to estimate the ambient concentrations at specified receptor sites for any toxic air pollutant emitted from the point(s) of emission. (6-30-95)	Yes	TAP ambient concentrations were determined based on the modeling protocol approved by IDEQ.
210.03a i	For screening modeling, the models use arbitrary meteorological data and predict maximum one (1) hour concentrations for all specified receptor sites. For toxic air pollutants listed in Section 586, multiply the maximum hourly concentration output from the model by a persistence factor of one hundred twenty five one thousandths (0.125) to convert the hourly average to an annual average. For toxic air pollutants listed in Section 585, multiply the maximum hourly concentration output from the model by a persistence factor of four tenths (0.4) to convert the hourly concentration to a twenty-four (24) hour average. (6-30-95)	No	A refined model was used, not a screening model.
210.03a ii	For refined modeling, the models use site specific information. If actual meteorological data is used and the model predicts annual averages for toxic air pollutants listed in Section 586 and twenty-four (24) hour averages for toxic air pollutants listed in Section 585, persistence factors need not be used. (6-30-95)	No	Actual meteorological data was used for Section 585 and 586 TAPs and therefore persistence factors

Citation	Requirement	Applies	Explanation
			were not used.
210.03b	The point of compliance is the receptor site that is estimated to have the highest ambient concentration of the toxic air pollutant of all the receptor sites that are located either at or beyond the facility property boundary or at a point of public access; provided that, if the toxic air pollutant is listed in Section 586, the receptor site is not considered to be at a point of public access if the receptor site is located on or within a road, highway or other transportation corridor transecting the facility. (6-30-95)	Yes	Receptor sites are located at and beyond ON facility boundary. ON's facility does not have a public access road, highway or transportation corridor transecting the property.
210.03c	The uncontrolled ambient concentration of the source or modification is estimated by modeling the uncontrolled emission rate. (6-30-95)	No	ON used Section 210.03d to estimate ambient concentrations.
210.03d	The controlled ambient concentration of the source or modification is estimated by modeling the controlled emission rate. (6-30-95)	Yes	Controlled emissions rates were used to determine the controlled ambient concentration.
210.03e	The approved net ambient concentration from a modification for a toxic air pollutant at each receptor is calculated by subtracting the estimated decreases in ambient concentrations for all sources at the facility contributing an approved creditable decrease at the receptor site from the estimated ambient concentration from the modification at the receptor. (6-30-95)	No	Net ambient concentrations were not calculated.
210.03f	The approved offset ambient concentration from a source or modification for a toxic air pollutant at each receptor is calculated by subtracting the estimated decreases in ambient concentrations for all sources contributing an approved offset at the receptor from the estimated ambient concentration for the source or modification at the receptor. (6-30-95)	No	Offset ambient concentrations were not considered.
210.03g	The T-RACT ambient concentration of the source or modification is estimated by using refined modeling and the T-RACT emission rate. (6-30-95)	No	T-RACT ambient concentrations were not used.
210.03h	The approved interpollutant ambient concentration from a source or modification for a toxic air pollutant at each receptor is calculated as follows: (6-30-95)	No	There are no interpollutant trade TAPs for the ON facility.
210.04	Preconstruction Compliance Demonstration. The applicant may use any of the Department approved standard methods described in Subsections 210.05 through 210.08, and may use any applicable specialized method described in Subsections 210.09 through 210.12 to demonstrate preconstruction compliance for each identified toxic air pollutant. (6-30-95)	Yes	ON Semiconductor used Section 210.08 to demonstrate TAP compliance.
210.05	Uncontrolled Emissions. (6-30-95)		

Citation	Requirement	Applies	Explanation
210.05a	Compare the source's or modification's uncontrolled emissions rate for the toxic air pollutant to the applicable screening emission level listed in Sections 585 or 586. (6-30-95)	No	Section 210.08 was used to demonstrate compliance.
210.05b	If the source's or modification's uncontrolled emission rate is less than or equal to the applicable screening emission level, no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process. (6-30-95)	No	Section 210.08 was used to demonstrate compliance.
210.06	Uncontrolled Ambient Concentration. (6-30-95)	No	Section 210.08 was used to demonstrate compliance.
210.07	Controlled Emissions and Uncontrolled Ambient Concentration. (6-30-95)	No	Section 210.08 was used to demonstrate compliance.
210.08	Controlled Ambient Concentration. (6-30-95)		
210.08a	Compare the source's or modification's controlled ambient concentration at the point of compliance for the toxic air pollutant to the applicable acceptable ambient concentration listed in Sections 585 or 586. (6-30-95)	Yes	ON Semiconductor controlled TAPs were compared to their respective concentrations in Sections 585 or 586.
210.08b	If the source's or modification's controlled ambient concentration at the point of compliance is less than or equal to the applicable acceptable ambient concentration, no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process. (6-30-95)	Yes	ON Semiconductor meets all TAP ambient concentrations listed in Section 585 or 586.
210.08c	The Department shall include an emission limit for the toxic air pollutant in the permit to construct that is equal to or, if requested by the applicant, less than the emission rate that was used in the modeling. (6-30-95)	Yes	ON has requested a baseline hourly emission rate for two process TAPs. ON is also proposing to compare emission increases against AAC/AACC limits and conducting refined modeling when emission increases are 95% of the AAC/AACC limit.
210.09	Net Emissions. (6-30-95)	No	ON Semiconductor is submitting a permit application establishing a defined baseline,

Citation	Requirement	Applies	Explanation
			FEC and growth emissions. Net emissions are not being used to demonstrate compliance.
210.10	Net Ambient Concentration. (6-30-95)	No	ON Semiconductor is submitting a permit application establishing a defined baseline, FEC and growth emissions. Net emissions are not being used to demonstrate compliance.
210.11	Toxic Air Pollutant Offset Ambient Concentration. (6-30-95)	No	ON Semiconductor is not using offsets to demonstrate compliance.
210.12	T-RACT Ambient Concentration for Carcinogens. (6-30-95)	No	ON Semiconductor is not using T-RACT to demonstrate compliance for carcinogenic TAPs. Carcinogenic TAP compliance is demonstrated using Section 586.
210.13	T-RACT Determination Processing. (6-30-95)	No	ON Semiconductor is not using T-RACT to demonstrate compliance for carcinogenic TAPs. Carcinogenic TAP compliance is demonstrated using Section 586.
210.14	T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows: (6-30-95)	No	ON Semiconductor is not using T-RACT to demonstrate compliance for carcinogenic TAPs. Carcinogenic TAP compliance is demonstrated using

Citation	Requirement	Applies	Explanation
			Section 586.
210.15	Short Term Source Factor. For short term sources, the applicant may utilize a short term adjustment factor of ten (10). For a carcinogen, multiply either the applicable acceptable ambient concentration (AACC) or the screening emission rate, but not both, by ten (10), to demonstrate preconstruction compliance. This method may be used for TAPs listed in Section 586 only and may be utilized in conjunction with standard methods for quantification of emission rates (Subsections 210.05 through 210.08). (4-5-00)	No	ON Semiconductor does not have a short term source and did not utilize this process for determining compliance of any TAPs.
210.16	Environmental Remediation Source. (6-30-95)	No	ON Semiconductor is not a remediation source.
210.17	Interpollutant Trading Ambient Concentration. (6-30-95)	No	ON Semiconductor is not using interpollutant trading to demonstrate regulatory compliance.
210.18	Interpollutant Trading Determination Processing. (6-30-95)	No	ON Semiconductor is not using interpollutant trading to demonstrate regulatory compliance.
210.19	Interpollutant Determination. (6-30-95)	No	ON Semiconductor is not using interpollutant trading to demonstrate regulatory compliance.
210.20	NSPS and NESHAP Sources. (6-30-95)		
210.20a	If the owner or operator demonstrates that the toxic air pollutant from the source or modification is regulated by the Department at the time of permit issuance under 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63, no further procedures for demonstrating preconstruction compliance will be required under Section 210 for that toxic air pollutant as part of the application process. (6-30-95)	No	The 40 CFR Part 60 Subpart Dc and Part 63 regulations that are applicable to ON Semiconductor do not specifically TAPs. Compliance is demonstrated through Section 210.08
210.20b	If the owner or operator demonstrates that the toxic air pollutant from the source or modification is regulated by the EPA at the time of permit issuance under 40 CFR Part 60, 40 CFR Part 61 or 40 CFR Part 63 and the permit to construct issued by the Department contains adequate provisions implementing the federal standard, no	No	The 40 CFR Part 60 Subpart Dc and Part 63 regulations that are applicable to ON

Citation	Requirement	Applies	Explanation
	further procedures for demonstrating preconstruction compliance will be required under Section 210 for that toxic air pollutant as part of the application process. (6-30-95)		Semiconductor do not specifically TAPs. Compliance is demonstrated through Section 210.08
210.21	Permit Compliance Demonstration. Additional procedures and requirements to demonstrate and ensure actual and continuing compliance may be required by the Department in the permit to construct. (5-1-94)	Yes	
210.22	Interpretation and Implementation of Other Sections. Except as specifically provided in other sections of these rules, the provisions of Section 210 are not to be utilized in the interpretation or implementation of any other section of these rules. (6-30-95)	Yes	
211	CONDITIONS FOR PERMITS TO CONSTRUCT.		
211.01	Reasonable Conditions. The Department may impose any reasonable conditions upon an approval, including conditions requiring the stationary source or facility to be provided with: (5-1-94)		
211.01a	Sampling ports of a size, number, and location as the Department may require; (5-1-94)	Yes	However, ON is an existing facility and there may be physical and technical limitations on location, number, and size of sampling ports.
211.01b	Safe access to each port; (5-1-94)	Yes	To the extent possible given the conditions of the existing facility.
211.01c	Instrumentation to monitor and record emissions data; (5-1-94)	No	It would be extremely difficult for ON to install instrumentation to continuously monitor and record emissions data. Periodic emissions sampling, if required, would be more appropriate.
211.01d	Instrumentation for ambient monitoring to determine the effect emissions from the stationary source or facility may have, or are having, on the air quality in any area affected by the stationary source or facility; and (5-1-94)	No	It would be extremely difficult for ON to install instrumentation to continuously monitor and record ambient

Citation	Requirement	Applies	Explanation
			concentrations. Periodic sampling, if required, would be more appropriate.
211.01e	Any other sampling and testing facilities as may be deemed reasonably necessary. (5-1-94)	Yes	ON is expecting there may be some testing required to verify emission estimates.
211.02	Cancellation. The Department may cancel a permit to construct if the construction is not begun within two (2) years from the date of issuance, or if during the construction, work is suspended for one (1) year. (5-1-94)	No	ON is an existing facility submitting a voluntary PTC.
211.03	Notification to The Department. Any owner or operator of a stationary source or facility subject to a permit to construct shall furnish the Department written notifications as follows: (5-1-94)		
211.03a	A notification of the anticipated date of initial start-up of the stationary source or facility not more than sixty (60) days or less than thirty (30) days prior to such date; and (5-1-94)	No	However, ON Semiconductor will provide notification in accordance with Section 181.
211.03b	A notification of the actual date of initial start-up of the stationary source or facility within fifteen (15) days after such date. (5-1-94)	No	However, ON Semiconductor will provide notification in accordance with Section 181.
211.04	Performance Test. Within sixty (60) days after achieving the maximum production rate at which the stationary source or facility will be operated but not later than one hundred eighty (180) days after initial start-up of such stationary source or facility, the owner or operator of such stationary source or facility may be required to conduct a performance test in accordance with methods and under operating conditions approved by the Department and furnish the Department a written report of the results of such performance test. (5-1-94)	Yes	Should IDEQ deem that a performance test is necessary for the ON facility, the required testing will be completed within 180 days.
211.04a	Such test shall be at the expense of the owner or operator. (5-1-94)	Yes	
211.04b	The Department may monitor such test and may also conduct performance tests. (5-1-94)	Yes	IDEQ is welcome to monitor any permit required testing. ON requests that any testing IDEQ would like to perform be coordinated in with ON.
211.04c	The owner or operator of a stationary source or facility shall provide the Department fifteen (15) days prior notice of the performance test to afford the Department the opportunity to have an observer present. (5-1-94)	Yes	ON will provide all necessary notifications.

Citation	Requirement	Applies	Explanation
212	OBLIGATION TO COMPLY		
212.01	Responsibility to Comply with All Requirements. Receiving a permit to construct shall not relieve any owner or operator of the responsibility to comply with all applicable local, state and federal statutes, rules and regulations. (5-1-94)	Yes	
212.02	Relaxation of Standards or Restrictions. At such time that a particular facility or modification becomes a major facility or major modification solely by virtue of a relaxation in any enforceable emission standard or restriction on the operating rate, hours of operation or on the type or amount of material combusted, stored or processed, which was used to exempt the facility or modification from certain requirements for a permit to construct, the requirements for new major facilities or major modifications shall apply to the facility or modification as though construction had not yet commenced. (5-1-94)	No	ON is a minor source and would not become a major facility through a relaxation of any standard.
213	PRE-PERMIT CONSTRUCTION. This section describes how owners or operators may commence construction or modification of certain stationary sources before obtaining the required permit to construct. (3-23-98)	No	ON is an existing facility applying for a voluntary PTC with a FEC. Once a permit is obtained, applicable modifications will be submitted based on Section 180 or 202.
213.01	Pre-Permit Construction Eligibility. Pre-permit construction approval is available for non-major sources and non-major modifications and for new sources or modifications proposed in accordance with Subsection 213.01.d. Pre-permit construction is not available for any new source or modification that: uses emissions netting to stay below major source levels; uses optional offsets pursuant to Section 206; or would have an adverse impact on the air quality related values of any Class I area. Owners or operators may ask the Department for the ability to commence construction or modification of qualifying sources under Section 213 before receiving the required permit to construct. To obtain the Department's pre-permit construction approval, the owner or operator shall satisfy the following requirements:	No	ON is an existing facility applying for a voluntary PTC with a FEC. The PTC application demonstrates compliance with all applicable regulations at the proposed FEC limits.
213.02	Permit to Construct Procedures for Pre-Permit Construction. (3-23-98)	No	Section 213 does not apply to ON since ON is an existing facility applying for a voluntary PTC with a FEC. The PTC application demonstrates compliance with all applicable regulations at the proposed FEC limits.
214	DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE FOR NEW AND RECONSTRUCTED MAJOR SOURCES OF HAZARDOUS AIR POLLUTANTS.	No	ON is not a major source of hazardous air pollutants. Per 40

Citation	Requirement	Applies	Explanation
			CFR 63.7180(b) ON Semiconductor does not emit more than 10 tpy of any single HAP or more than 25 tpy of any combination of HAP.
215	MERCURY EMISSION STANDARD FOR NEW OR MODIFIED SOURCES. No owner or operator may commence construction or modification of a stationary source or facility that results in an increase in annual potential emissions of mercury of twenty-five (25) pounds or more unless the owner or operator has obtained a permit to construct under Sections 200 through 228 of these rules. The permit to construct application shall include an MBACT analysis for the new or modified source or sources for review and approval by the Department. A determination of applicability under Section 215 shall be based upon the best available information. Fugitive emissions shall not be included in a determination of applicability under Section 215. (4-7-11)	No	Mercury emissions are only from the operation of the boilers. ON Semiconductor will only emit 0.24 lbs/hr, which includes future growth. This corresponds to 1% of the EL.
216 -- 219	(RESERVED)		
220	GENERAL EXEMPTION CRITERIA FOR PERMIT TO CONSTRUCT EXEMPTIONS.		
220.01	General Exemption Criteria. Sections 220 through 223 may be used by owners or operators to exempt certain sources from the requirement to obtain a permit to construct. Nothing in these sections shall preclude an owner or operator from choosing to obtain a permit to construct. For purposes of Sections 220 through 223, the term source means the equipment or activity being exempted. For purposes of Sections 220 through 223, fugitive emissions shall not be considered in determining whether a source meets the applicable exemption criteria unless required by federal law. No permit to construct is required for a source that satisfies all of the following criteria, in addition to the criteria set forth at Sections 221, 222, or 223: (4-11-06)	No	ON is not requesting an exemption for any source.
221	CATEGORY I EXEMPTION No permit to construct is required for a source that satisfies the criteria set forth in Section 220 and the following: (4-5-00)	No	ON is not requesting an exemption for any source.
222	CATEGORY II EXEMPTION. No permit to construct is required for the following sources. (4-5-00)	No	ON is not requesting an exemption for any source.
223	EXEMPTION CRITERIA AND REPORTING REQUIREMENTS FOR TOXIC AIR POLLUTANT EMISSIONS. No permit to construct for toxic air pollutants is required for a source that satisfies any of the exemption criteria below, the recordkeeping requirements at Subsection 220.02, and reporting requirements as follows: (4-5-00)	No	ON is not requesting an exemption for any source.
224	PERMIT TO CONSTRUCT APPLICATION FEE. All applicants for a permit to construct shall submit a permit to construct application fee of one thousand dollars ($1,000) to the Department at the time of the original submission of the application. The permit to construct application fee is not required to be submitted for: (7-1-02)	Yes	

Citation	Requirement	Applies	Explanation
224.01	Exemption Applicability Determinations. Exemption applicability determinations set forth in Sections 220 through 223; (7-1-02)	No	Exemptions set forth in Sections 220-223 are not applicable to ON Semiconductor.
224.02	Typographical Errors. Changes to correct typographical errors; or (7-1-02)	Yes	
224.03	Name or Ownership Change. A change in the name or ownership of the holder of a permit to construct when the Department determines no other review or analysis is required. (7-1-02)	Yes	
225	PERMIT TO CONSTRUCT PROCESSING FEE. A permit to construct processing fee, calculated by the Department pursuant to the categories provided in the following table, shall be paid to the Department by the person receiving the permit. The applicable processing fee category shall be determined by adding together the amount of increases of regulated pollutant emissions and subtracting any decreases of regulated pollutant emissions as identified in the permit to construct. The fee calculation shall not include fugitive emissions.	Yes	IDEQ will establish the processing fee for the permit upon reviewing PTC.

PERMIT TO CONSTRUCT CATEGORY	FEE
General permit, no facility-specific requirements (Defined as a source category specific permit for which the Department has developed standard emission limitations, operating requirements, monitoring and recordkeeping requirements, and that require minimal engineering analysis. General permit facilities may include portable concrete batch plants, portable hot-mix asphalt plants and portable rock crushing plants.)	$500
New source or modification to existing source with increase of emissions of less than one (1) ton per year	$1,000
New source or modification to existing source with increase of emissions of one (1) to less than ten (10) tons per year	$2,500
New source or modification to existing source with increase of emissions of ten (10) to less than one hundred (100) tons per year	$5,000
Nonmajor new source or modification to existing source with increase of emissions of one hundred (100) tons per year or more	$7,500
New major facility or major modification	$10,000
Permit modifications where no engineering analysis is required	$250
Application submittals for exemption applicability determinations, typographical errors, and name and ownership changes as described in Subsections 224.01, 224.02, 224.03	$0.00

Citation	Requirement	Applies	Explanation
226	PAYMENT OF FEES FOR PERMITS TO CONSTRUCT.		
226.01	Fee Submittal. The permit to construct application fee shall be submitted with the application. The permit to construct processing fee shall be payable upon receipt of an assessment sent to the person receiving a permit by the Department. The permit to construct application and processing fees shall be sent to: Air Quality Permit to Construct Fees Fiscal Office, Idaho Department of Environmental Quality 1410 N. Hilton, Boise, ID 83706-1255 (7-1-02)	Yes	
226.02	Delinquency. No application for a permit to construct shall be processed by the Department unless accompanied by a permit to construct application fee. No permit to construct shall be issued by the Department until the Department has received the permit to construct processing fee. (7-1-02)	Yes	
227	RECEIPT AND USAGE OF FEES. Permit to construct application and processing fee receipts shall be deposited by the Department into a stationary source permit account. Monies from this account shall be used solely toward technical, legal and administrative support of the Department's permit to Construct and Tier II permit programs and shall not be used for those activities supported by the fund created for implementing the operating permit program required under Title V of the federal Clean Air Act amendments of 1990. The permit to construct application fee payable under Section 227 shall be retained by the Department regardless of whether a permit to construct is issued by the Department in response to an application. The Department will review the fee schedule at least every two (2) years. (7-1-02)	Yes	
228	APPEALS. A person may be able to file an appeal within thirty-five (35) days of the date the person receives an assessment from the Department under Section 225, in accordance with IDAPA 58.01.23, "Rules of Administrative Procedure Before the Board of Environmental Quality." (5-3-03)	Yes	

Appendix E

Fuel Combustion Source and Information

Table of Contents

Boiler Information E-1

Emergency Generators.....E-2

Boiler Information

Location	Emission Unit ID	Manufacturer Model Number	Install Year	Rated Output[3] HP	Rated Output[3] MMBtu per Hr	On-line Rating (hrs/yr) Actual	On-line Rating (hrs/yr) Used for PTE	Fuel	Fuel Rate SCFH or GPH	Remarks
Building A	ABOI	Teledyne Laars PH0850 IN0 9K01	1987	20.6	0.69	4,380	8,760	Natural Gas @ 1020 BTU/CF	833	Hot water boiler, winter service only. 81% efficiency per manufacturer. AP-42 class: small boiler, uncontrolled.
Building B	BBOIHWB	Sellers 15 Senior S-200-W	1990	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building B	BBOIST	Sellers 15 Senior 175 HP	1995	175	5.86	8,760	8,760	Natural Gas @ 1020 BTU/CF	7,179	Steam boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building C	CBOIHWB	Sellers 15 Senior S-200-W	1982	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building D	DBOIHWB	Sellers 15 Senior S-200-W	1982	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building D	DBOIST1	Sellers 15 Commodore 125	1983	125	4.18	8,760	8,760	Natural Gas @ 1020 BTU/CF	5,128	Steam boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building G	GBOIHWE	Lochinvar CWN1436PM	1997	35	1.16	4,380	8,760	Natural Gas @ 1020 BTU/CF	1,407	Hot water boiler, winter service only. 81% efficiency per manufacture. AP-42 class: small boiler, uncontrolled.
Building G	GBOISB1	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.
Building G	GBOISB2	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.
Building G	GBOISB3	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.
Building G	GBOISB4	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	Future potential boiler. Assumed will be sized equivalent to GBOISB1-3 for calculations.
Building G	GBOISB5	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	Future potential boiler. Assumed will be sized equivalent to GBOISB1-3 for calculations.

Boiler HP is equivalent to 33,475 BTU/hr.
TBD = to be determined

Emergency Generators

Location	Emission Unit ID	Manufacturer	Install Year	Gen Rated Output	Engine Rated Output	On-line Rating (hrs/yr)		Fuel	Fuel Rate	Remarks
		Model Number		HP	HP	Actual	Used for PTE		SCFH or GPH	
Building B	BEMGEN	Onan 15.0 RJC 15 kW	1970	20	--	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	255	Supports Building B. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.
Building C	CEMGENR	Onan 15.0 RJC 15 kW	1974	20	--	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	255	Supports Building C. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.
Building C (outside, S side)	CEMGENS	Caterpillar 1250 kW	2001	1676	1818	26	100	Diesel @ 128,750 BTU/gal[a], 0.15% sulfur	48.9	Supports Building D (Fab 9). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. TMI Engine and Compressor Performance Test DM6686-00. Fuel rate are at 50% load. Fuel rate per engine test.
Building D	DEMGEN	Onan 30.OEK-15R/9336M 30 kW	1983	40	82	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	600	Supports Building D. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.
Building D Support Room 1138	DMREMGEN	Kohler 60RZ72 60 kW	1996	80	126	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	960	Supports Bldg D (Fab 9) and GH 10. AP-42 classification: 4-stroke, rich-burn engine, 60% load.
Building G (outside, E side)	GEEMGEN	Caterpillar 1250 kW	1998	1676	1818	26	100	Diesel @ 128,750 BTU/gal[a] 0.15% sulfur	46.6	Supports Building H (Fab 10). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. TMI Engine and Compressor Performance Test TM3401. Fuel rate are at 50% load. Fuel rate per engine test.
Building G (outside, S side)	GOEMGEN	Caterpillar 1825 kW	2005	2447	2593	26	100	Diesel @ 128,750 BTU/gal[a] 0.15% sulfur	67.3	Supports Building H (Fab 10). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. Fuel rate per engine test. Cat Gen Set Package Emission Certification. Fuel rate are at 50% load.

Appendix F

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Examples of how individual emissions were calculated are provided in the following sections. Where the calculation of an emission deviates from the standard method described, for example fluorides, chlorides, and $PM_{2.5/10}$, an explanation of how these emission rate were calculated has been provided. Appendix F-1 provides tables showing the individual calculations for each of the emissions sections described below.

1.0 BOILER EMISSIONS

Appendix E summarizes the boiler operating conditions. Emissions are calculated based on fuel usage, efficiency rating (where applicable), hours of use per year, and AP-42 emission factors.

Example Criteria Baseline Emissions for Boiler GBOISB1:

Table 1. AP-42 Criteria Pollutant Emission Factors for Boilers

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Boiler Size
NO_x	1.4-1.	9.80E-02	<100 MMBTU/hr Uncontrolled
NOx	1.4-1.	4.90E-02	<100 MMBTU Controlled – Low NOx Burner
CO	1.4-1.	8.24E-02	<100 MMBTU/hr
SO_2	1.4-2.	5.88E-04	All
VOC	1.4-2.	5.39E-03	All
$PM_{2.5}$	1.4-2.	7.45E-03	All

Rated Output = 10.04 MMBTU/hr
GBOISB1 Efficiency = 80%
AP-42 Table 1.4-1 emission factor for NOx = 4.90E-02 lb/MMBTU (Table 1)
1020 BTU/SCF = Heating value of natural gas

$$NOx\ Baseline\ Emission\ Rate = 4.90E-02\frac{lbs}{MMBTU} * 10.04\frac{MMBTU}{hr} * \frac{}{0.80}$$
$$= 0.615\frac{lbs}{hr}NOx$$

$$0.615\frac{lbs}{hr}NOx * 8760\frac{hrs}{yr} * \frac{ton}{2000\ lbs} = 2.7\frac{tons}{yr}$$

There are some activities, deemed insignificant based on size or quantity[1], that the State has required be evaluated for the significant impact analysis when facility-wide modeling is conducted. These include space heaters and hot water heaters using natural gas, propane or kerosene and generating less than five million (5,000,000) Btu/hr. At the ON facility there are three domestic-sized natural gas water heaters in Buildings B, C and E, eleven natural gas space heaters, and 4 air handling units located in small support buildings throughout the facility that

[1] "Insignificant" activities per IDAPA 58.01.01.317.01.b.

fall into this category. Emissions were calculated based on the total heat input for all comfort heating units (3.88 MBTUs) for 24 hour a day usage, 8 months out of the year. The emissions are calculated using AP-42[2] emission factors for residential furnaces. These calculations were completed in the same manner as the example calculations for the larger boilers described above.

The total emissions from the multiple comfort heating units are estimated to contribute from 2.4% to 6.2% per hour and 1.6% to 4.1% per year to the overall combustion equipment emissions. The percentage was calculated by dividing the sum of the heater emission rate by the sum of the boiler emission rate for each individual pollutant. For example:

$$Emission\ Increase = \frac{1.52E-01\frac{lb}{hr}CO_{heaters}}{6.39\frac{lb}{hr}CO_{boilers}} * 100 = 2.4\%$$

Since stack/vent information for these sources (i.e. flowrates, temperature, etc) are not available, the criteria pollutants emissions and hazardous air pollutants from the natural gas combustion sources (boilers) will be conservatively increased by 5%, for each individual averaging period, to account for the impact from these sources.

Example Calculations for Heater Increases for Boiler GBOISB1:

$$NOx\ Emission\ Rate = 0.615\frac{lbs}{hr}NOx * 5\% = 3.08E-02\frac{lbs}{hr}NOx$$

$$3.08E-02\frac{lbs}{hr} * 8760\frac{hrs}{yr} * \frac{ton}{2000\ lbs} = 0.135\frac{tons}{yr}NOx$$

Example Boiler HAP and TAP Calculations for GBOISB1:

Table 2. AP-42 Hazardous Air Pollutant Emission Factors for Boilers

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Boiler Size
Benzene	1.4-3	2.06E-06	All
Benzo(a)pyrene	1.4-3	1.18E-09	All
Formaldehyde	1.4-3	7.35E-05	All
Hexane	1.4-3	1.76E-03	All
3-Methylcholanthrene	1.4-3	1.76E-09	All
Naphthalene	1.4-3	5.98E-07	All
Pentane	1.4-3	2.55E-03	All
Toluene	1.4-3	3.33E-06	All
Arsenic	1.4-4	1.96E-07	All
Barium	1.4-4	4.31E-06	All

[2]AP-42, Fifth Ed., Vol. I, Chapter 1, Tables 1.4-1 and 1.4-2, July 1998.

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Boiler Size
Cadmium	1.4-4	1.08E-06	All
Chromium	1.4-4	1.37E-06	All
Cobalt	1.4-4	8.24E-08	All
Copper	1.4-4	8.33E-07	All
Manganese	1.4-4	3.73E-07	All
Mercury	1.4-4	2.55E-07	All
Molybdenum	1.4-4	1.08E-06	All
Nickel	1.4-4	2.06E-06	All
Zinc	1.4-4	2.84E-05	All

$$Benzene\ Emission\ Rate = 2.06E-06\frac{lbs}{MMTU} * 10.04\frac{MMBTU}{hr} * \frac{}{0.80}$$
$$= 2.58E-05\frac{lbs}{hr}Benzene$$
$$2.58E-05\frac{lbs}{hr}Benzene * 8760\frac{hr}{yr} * \frac{ton}{2000\ lbs} = 1.13E-04\frac{tons}{yr}Benzene$$

See Section 6.0 for a description of how the criteria pollutants and HAPs for GBOISB1, 2, and 3, were increased to account for FEC, and the TAPs for GBOISB1, 2, and 3 were increased for projected growth.

2.0 EMERGENCY GENERATOR EMISSIONS

Appendix E summarizes the emergency generators operating conditions. Emissions are calculated based on fuel usage, hours of use per year, and AP-42 emission factors.

Example for Natural Gas Emergency Generator DEMGEN:

Table 3. AP-42 Criteria Pollutant Emission Factors for Natural Gas Fired Emergency Generators

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Conditions
NO_x	3.2-3.	2.21E+00	Uncontrolled, 4-stroke, Rich burn, 90 - 105% Load
NOx	3.2-3.	2.27E+00	Uncontrolled, 4-stroke, Rich burn,<90% Load
CO	3.2-3.	3.72E+00	Uncontrolled, 4-stroke, Rich burn, 90 - 105% Load
CO	3.2-3.	3.51E+00	Uncontrolled, 4-stroke, Rich burn, <90% Load
SO_2	3.2-3.	5.88E-04	Uncontrolled, 4-stroke, Rich burn
VOC	3.2-3.	2.96E-02	Uncontrolled, 4-stroke, Rich burn
$PM_{2.5}$[2]	3.2-3.	9.50E-03	Uncontrolled, 4-stroke, Rich burn

Fuel Rate = 600 standard cubic feet per hour (SCFH)
AP-42 Table 3.2-3 emission factor for NOx = 2.21 lb/MMBtu (Table 3)
1020 BTU/SCF = Heating value of natural gas

$$NOx\ Baseline\ Emission\ Rate = 600\frac{SCF}{hr} * 1020\frac{BTU}{SCF} * \frac{MMBTU}{10^6 BTU} * 2.21\frac{lbs}{MMBTU}$$
$$= 1.35\frac{lbs}{hr}NOx$$

Example Calculations for Heater Increases for Emergency Generator DEMGEN:
Increases in emissions to account for miscellaneous facility natural gas space heaters and boilers were based only on the Boiler emission estimates. This is due to the similarity of emissions from the heaters and boilers. All heater emissions were added in with the boiler emissions. Emergency Generator emissions were not increased to account for the heaters.

Example Emergency Generator HAP and TAP Calculations for DEMGEN:

Table 4. AP-42 Hazardous Air Pollutant Emission Factors for Diesel and Natural Gas Fired Emergency Generators

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Generator Type
1,1,2,2-Tetrachloroethane	3.2-3.	2.53E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
1,1,2-Trichloroethane	3.2-3.	1.53E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
1,1-Dichloroethane	3.2-3.	1.13E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
1.2-Dichloroethane	3.2-3.	1.13E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
1,2-Dichloropropane	3.2-3.	1.30E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
1,3-Butadiene	3.2-3.	6.63E-04	Natural Gas, Uncontrolled, 4-stroke, Rich burn
1,3-Dichloropropene	3.2-3.	1.27E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Acetaldehyde	3.2-3.	2.79E-03	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Acetaldehyde	3.4-3.	2.52E-05	Large Uncontrolled Stationary Diesel Engine
Acrolein	3.2-3.	2.63E-03	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Acrolein	3.4-3.	7.88E-06	Large Uncontrolled Stationary Diesel Engine
Benzene	3.2-3.	1.58E-03	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Benzene	3.4-3.	7.76E-04	Large Uncontrolled Stationary Diesel Engine
Benzo(a)pyrene	3.4-4.	2.57E-07	Large Uncontrolled Stationary Diesel Engine
Carbon Tetrachloride	3.2-3.	1.77E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Chlorobenzene	3.2-3.	1.29E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Chloroform	3.2-3.	1.37E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Ethylene Dibromide	3.2-3.	2.48E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Formaldehyde	3.2-3.	2.05E-02	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Formaldehyde	3.4-3.	7.89E-05	Large Uncontrolled Stationary Diesel Engine
Methanol	3.2-3.	3.06E-03	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Methylene Chloride	3.2-3.	4.12E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Naphthalene	3.2-3.	9.71E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Generator Type
Naphthalene	3.4-4.	1.30E-04	Large Uncontrolled Stationary Diesel Engine
PAHs	3.2-3.	1.41E-04	Natural Gas, Uncontrolled, 4-stroke, Rich burn
PAHs	3.4-4	8.17E-05	Large Uncontrolled Stationary Diesel Engine
Styrene	3.2-3.	1.19E-05	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Toluene	3.2-3.	5.58E-04	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Toluene	3.4-3.	2.81E-04	Large Uncontrolled Stationary Diesel Engine
Vinyl Chloride	3.2-3.	7.18E-06	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Xylenes	3.2-3.	1.95E-04	Natural Gas, Uncontrolled, 4-stroke, Rich burn
Xylenes	3.4-3.	1.93E-04	Large Uncontrolled Stationary Diesel Engine

$$Benzene\ Emission\ Rate\ for\ DEMGEN$$
$$= 600\frac{SCF}{hr} * 1020\frac{BTU}{SCF} * \frac{MMBTU}{10^6 BTU} * 1.58E-03\frac{lbs}{MMBTU}$$
$$= 9.67E-04\frac{lbs}{hr}Benzene_{DEMGEN}$$

$$9.67E-04\frac{lbs}{hr}Benzene_{DEMGEN} * 100\frac{hrs}{yr} * \frac{ton}{2000\ lbs} = 4.83E-05\frac{tons}{yr}Benzene_{DEMGEN}$$

Example for Diesel Emergency Generator GEEMGEN:
All diesel generators have test data for the criteria pollutants except for sulfur dioxide. The diesel generator test data is provided in Appendix I. AP-42 emission factors were used to estimate sulfur dioxide emissions.

Table 5. AP-42 Sulfur Dioxide Emission Factor for Diesel Emergency Generators

Pollutant	AP-42 Table No.	Emission Factor (lb/MMBTU)	Conditions
SO_2	3.4-1	1.01xS	Large Stationary Diesel Engine

Fuel Rate = 46.6 gallons per hour (gph) @ 50% load
Fuel Sulfur Percentage = 0.15%
Diesel = 128,750 BTU/gal = Heating value of diesel

$$SOx\ Emission\ Rate = 46.6\frac{gal}{hr} * 128{,}750\frac{BTU}{gal} * \frac{MMBTU}{10^6 BTU} * 1.01\frac{lbs}{MMBTU} * 0.0015$$
$$= 0.009\frac{lbs}{hr}SOx_{GEEMGEN}$$
$$0.009\frac{lbs}{hr}SOx * 100\frac{hrs}{yr} * \frac{ton}{2000\ lbs} = .00045\frac{tons}{yr}SOx_{GEEMGEN}$$

3.0 COOLING TOWER EMISSIONS

Appendix H summarizes the cooling towers operating conditions. PM_{10} emissions for the cooling towers are calculated based on cooling tower configuration, water recirculation flow rate, conductivity, hours of use per year, and AP-42 emission factors using the following equation:

PM_{10} Baseline Emission Rate (lbs/hr) = Cooling Water Recirculation Rate (GPH) * AP-42 EF * Total Dissolved Solids

Example for Cooling Tower GCT1:
Conductivity = 2,900 µmho/cm
Cooling water flow = 3,000 gpm * 60 min/hr = 180,000 gph
AP-42 Table 13.4-1 emission factor for PM_{10} = 1.70 lb/10^3gallons[3]

$$Total\ Dissolved\ Solids = \frac{2900\ {}^{\mu mho}/_{cm} * 640{,}000}{10^6} = 1{,}856\ ppm$$

$$PM_{10}\ Emission\ Rate = 180{,}000\frac{gal}{hr} * \frac{1.7\ lbs}{1000\ gal} * \frac{1{,}856}{10^6} = 0.57\frac{lbs}{hr}PM_{10_{GCT1}}$$

$$0.57\frac{lbs}{hr}PM_{10_{GCT1}} * 8760\frac{hr}{yr} * \frac{tons}{2000\ lbs} = 2.49\frac{tons}{yr}PM_{10_{GCT1}}$$

Note: The web site http://www.lenntech.com/unit-conversion-calculator/tds_engels.htm provided the conversion from µmho/cm to ppm.

4.0 PROCESS AND FACILITY EMISSIONS

Chemical usage and emission rates have been calculated separately for Fab 9, Fab 10, and other process support activities (i.e. wastewater treatment system). The calculations are based upon chemical use and inventory information provided by ON Semiconductor for calendar year 2007[4] for each process, with each commercial product broken down into individual constituents and concentration based on their respective Material Safety Data Sheet (MSDS). Individual constituent concentrations taken from the MSDS were evaluated in one of two ways based on engineering judgment, 1) the maximum concentration was used for each individual constituent (regardless if the sum of the individual constituent percentages added up to greater than 100%) or 2) an average of the percent concentration range for each individual compound was used (i.e. a concentration range of 20%-40% would have an average of 30%). Regulated air pollutants, including HAPs, VOCs, and TAPs, are annotated in Appendix B and J.

To determine process HAP, VOC, and TAP pollutant emission rates the following approach was used:

[3] AP-42, Chapter 13, Table 13.4-2, January 1995.
[4] Staci O'Connel, ON, *2007 Chemical Use Worksheet*, January 7, 2008.

1. The 2007 usage rate for the chemical was established from ON inventory records. The 2007 emission rate was calculated by subtracting any material recovered in solvent waste recovery from the 2007 usage rate.
2. The emission rate for each chemical was then calculated by multiplying the 2007 uncontrolled emission rate by an emission factor. This provided the uncontrolled maximum potential emission rate. For chemicals ***not*** routed through an air pollution abatement system, the uncontrolled maximum potential emission rate is the baseline emission rate.
3. For emissions that are routed to an air pollution abatement system, a controlled maximum potential emission rate was then calculated by multiplying the 2007 uncontrolled emission rate by an efficiency rating for the pollution abatement system, providing the baseline emission rate.
4. For most chemicals, the hourly uncontrolled and/or controlled emission rate was converted into an annual rate by multiplying by 8760 hours.
5. The FEC calculation for HAPs and VOCs is described in Section 6.3.

And finally for the semiconductor process TAPs, an increase in emissions above the baseline emissions were calculated using the following approach:

6. Projected growth was based on process emission rates increasing by the ratio of the maximum projected wafer production rate to the 2007 wafer production rate. The 2007 wafer production rate is 217,601 wafer starts per year (approximately 4,100 wafer starts per week) and ON's maximum production projection of 391,040 wafer starts per year (or approximately 7,400 wafer starts per week).[5] This equates to a 180% increase in TAP emissions. This is the potential to emit (PTE) for TAPs.

   Note: This is for semiconductor process TAP projected growth calculations only. TAP projected growth calculations for non-fab or non-process TAPs are described in the individual equipment sections.

4.1 Emission Factors

Table 6 provides the emission factors (EF) assumed for each defined chemical process. If a chemical used in the fabrication of wafers did not fall into one of the categories below, it was assumed that 100% of that chemical was emitted (minus any waste recovery).

Table 6. Process Emission Factors

Process	EF	Source/Comment
Wet Chemical Station	30%	Bay Area Air Quality Management (BAAQM) District Permit Handbook Section 7 Chapter 4 - Semiconductor Manufacturing - Revision 2.0[6]. Very conservatively based on solvent station use since BAAQM recommends negligible.

[5] E-mail Message from Staci O'Connell, ON, to Mark Torf, TORF Environmental Management, *Re: Wafer Numbers to use for Max. Capacity*, July 29, 2003.

[6] Bay Area Air Quality Management District Permit Handbook Section 7 Chapter 4 - Semiconductor Manufacturing, Revision 2.

Process	EF	Source/Comment
Wafer Etchant - Gaseous (thermally destroyed)	90%	Assume 90% of *gaseous* emissions are sent to scrubbers based on BAAQM wafer coating EF. A number of the etching tools have Point of Use (POU) abatement. While these are identified for information, credit is not taken for these POU's and a conservative EF of 90% was used.
Wafer Etchant - Liquid	1%	Bay Area Air Quality Management District Permit Handbook Section 7 Chapter 4 - Semiconductor Manufacturing - Revision 2.0. Assume 1% of the *liquid* solutions are emitted as emission to scrubbers based on BAAQM wet chemical station recommendation for negligible emissions.
Wafer Coating	90%	Bay Area Air Quality Management District Permit Handbook Section 7 Chapter 4 - Semiconductor Manufacturing - Revision 2.0.
Wipe Cleaning	100%	Assume 100% of un-recovered solution emitted.
Solvent Station	30%	Bay Area Air Quality Management District Permit Handbook Section 7 Chapter 4 - Semiconductor Manufacturing - Revision 2.0
Electrochemically Destroyed (Doping/Etching/Implanting)	90%	Assume 90% of *gaseous* emissions are sent to scrubbers based on BAAQM wafer coating EF.

Wastewater treatment facility emission factors are provided below in Table 7. Ammonia addition to the wastewater treatment process is a closed process and all general exhaust for the water treatment building is vented through a packed-bed scrubber.

In addition, all storage and process tanks in the wastewater treatment area are vented through a packed-bed scrubber.

Table 7. Wastewater Treatment Facility Emission Factors

Process	EF	Source/Comment
Liquid Addition (ammonia)	100%	To conservatively calculate controlled ammonia emissions, vaporization of the ammonia is assumed to be 100% due to the difficulty in determining EF for fugitive ammonia emissions.
Solids Addition[a]	1%	Solids, with the exception of lime, that are manually added to the wastewater treatment system, cooling towers, and boilers are assumed to have a conservative emission factor of 1%.
Lime Silo	0.00005%	U.S. EPA, Compilation of Air Pollutant Emission Factors (AP-42), Section 11.12 Table 11.12-2.

[a.] U.S. EPA, Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.4 provided an equation for estimating dust emissions for aggregate storage cycle, providing a conservative estimate since the correlations are for outside storage with frequent material transfers. Solids addition for the waste treatment facility is all done within a building and in small batches.

Calculations showed that the 1% emission factor was much more conservative than the aggregate storage pile predictive equation. Since the moisture content of the different waste treatment solids varied, the simplified 1% emission factor was used.

4.2 HAP, VOC, and TAP Example Calculations

An example of how HAP, VOC, and TAP emission rates were calculated is presented below using N-Butyl Acetate. N-Butyl Acetate is a VOC and a TAP but not a HAP; however the calculation methodology for HAPs is the same as for VOCs and TAPs.

Example Calculation – N-butyl acetate (n-BAct):
Normal butyl acetate (CAS No. 123-86-4) is found in two commercial products used by ON:

a. THMRiP 3150LB 15 cp. used in Fab 9
b. THMRiP 3150LB 22 cp. used in Fab 10

The THMRiP 3150LB 15 cp used in Fab 9 in 2007 consisted of 23 containers. Each container is 9lbs. The MSDS lists the n-butyl acetate concentration as 7.5wt%.

The THMRiP 3150 22 cp used in Fab 10 in 2007 consisted of 113 containers. Each container is 10 liters. The MSDS lists the n-butyl acetate concentration as 5 wt%.

Physical Properties and Constants:
Specific gravity = 1.07
Density of water = 8.34 lbs/gal (@ 50°F)
1 liter = 0.26412 gallons

$$Fab\ 9\ THMRiP\ 3150\ 15cp = 23\frac{containers}{yr} * 9\frac{lbs}{container} = 207\frac{lbs}{yr} THMRiP\ 3150\ 15cp$$

$$\begin{aligned} Fab\ 10\ THMRiP\ 3150\ 22cp \\ &= 113\frac{containers}{yr} * 10\frac{liters}{container} * 0.26412\frac{gal}{liter} * 1.07 * 8.34\frac{lbs}{gal} \\ &= 2663\frac{lbs}{yr} THMRiP\ 3150\ 22cp \end{aligned}$$

$$\begin{aligned} 207\frac{lbs\ 15cp}{yr} * 0.075\frac{lbs\ n-BAct}{lb\ THMRiP\ 15cp} + 2663\frac{lbs\ 22cp}{yr} * 0.05\frac{lbs\ n-BAct}{lb\ THMRiP\ 22cp} \\ &= 148.7\frac{lbs}{yr} n-BAct \end{aligned}$$

The 2007 uncontrolled emission rates are conservatively assumed to be the same as the usage rate, less any waste recovery as reported by ON and adjusted by emission factors. Waste characterization data is provided in Appendix F-1. Waste recovery information is based on samples collected in 2002, which was the last analysis conducted by ON. No significant process changes had been made prior to 2007 that would require a reevaluation of the waste analysis data.

Hourly emission rates are calculated for most constituents on 365 days per year, 24 hours per day production basis. The hourly basis for those constituents used in batch water treatment processes are noted in Table 10. The emissions for *process* HAPs, VOCs, and TAPs are calculated using the following two equations:

Uncontrolled HAP, VOC, and TAP Emissions:
Baseline Uncontrolled Emission Rate (lb/yr) = Chemical usage (lb/yr) * (1-%Waste Recovery) * EF / (365 days) / (24 hrs)

Controlled HAP, VOC, and TAP Emissions (where applicable):
Baseline Controlled Emissions (lb/yr) = Uncontrolled Emission Rate (lb/yr) * (1 – Scrubber Efficiency)

2002 Waste Recovery: Total Solvent Waste = 208,979 lbs
Fab 9 Waste Quantity = 58.4% of total
Fab 9 Waste n-butyl acetate = 0 wt%
Fab 10 Waste n-butyl acetate = 0.0024 wt%

N-Butyl Acetate recovered in the waste:

$$0\frac{lb\ n-BAct}{lb\ Fab\ 9\ waste} * 0.584\frac{lb\ Fab\ 9\ waste}{lb\ waste} + 0.0000235\frac{lb\ n-BAct}{lb\ Fab\ 10\ waste} * (1-0.584)\frac{lb\ Fab\ 10\ waste}{lb\ waste} * 208{,}979\ lbs\ waste = 2.04\ lbs\ n-BAct$$

Percent N-Butyl Acetate recovered in the waste:

$$\frac{2.04\ lbs\ n-BAct\ 2002\ waste\ recoverd}{110.5\ lbs\ n-BAct\ 2002\ usage} * 100 = 2\%$$

HAP, VOC, and TAP Emissions:

$$148.7\frac{lb\ n-BAct}{yr} * (1-.02) * 90\% EF_{(wafer\ coating)} * \frac{yr}{365\ days} * \frac{day}{24\ hrs} = 1.50E-02\ \frac{lbs}{hr} n-BAct$$

Controlled process emission rates were calculated for HAPs, VOCs, and TAPs when these compounds were routed through a pollution abatement system, N-Butyl Acetate is not routed through a pollution abatement system so its uncontrolled baseline emission rate is equivalent to a controlled baseline emission rate.

Projected Growth for TAPs:

$$1.50E-02\frac{lb\ n-BAct}{hr} * 391{,}040\frac{wafer\ starts}{yr} * \frac{yr}{217{,}601\ wafer\ starts} - 1.50E-02\frac{lb\ n-BAct}{hr} = 1.20E-02\ \frac{lbs}{hr} n-BAct$$

The combustion equipment does not have air pollution abatement systems. All combustion equipment HAPs, VOCs, and TAPs baseline emission rates are uncontrolled. References to controlled emission rates are equivalent to uncontrolled emission rates for combustion related emissions.

4.2.1 Semiconductor Process TAP Calculation

Example N-Butyl Acetate:
Fab 9 + Fab 10 = 1.50E-02 lbs/hr n-BAct
Projected Growth = 1.20E-02 lbs/hr n-BAct

TAP PTE for N-Butyl Acetate:

$$1.50E-02\frac{lb\ n-BAct}{hr}_{baseline}+1.20E-02\frac{lb\ n-BAct}{hr}_{projected\ growth}$$
$$=2.70E-02\ \frac{lbs}{hr}n-BAct=$$

The modeled worst case 24-hour and annual Chi/Q for semiconductor process sources was used to determine the concentration of process TAPs for comparison against AAC and AACC limits listed in IDAPA 58.01.01.585-586. The following equations were used to calculate the concentration of the released ON process chemicals:

AAC TAP Emission (µg/m^3) = $TAP_{non\text{-}carcinogenic}$ (lb/hr) * Chi $_{24\text{-}hr}$/Q (µg/m^3/lb/hr)
AACC TAP Emission (µg/m^3) = $TAP_{carcinogenic}$ (lb/hr) * Chi $_{annual}$/Q (µg/m^3/lb/hr)

N-butyl acetate is a non-carcinogen, the AAC for n-Butyl Acetate is 35.5 mg/m^3. The maximum non-carcinogen $Chi_{24\text{-}hr}$/Q = 281.7 (µg/m^3)/(g/s) for process sources (i.e. exhausts and scrubbers).

N-Butyl Acetate Emission Concentration:

$$\frac{\text{Chi}}{\text{Q}}_{24-\text{hr}}=281.7\frac{\frac{\mu g}{m^3}}{\frac{g}{s}}*453.59\frac{g}{lb}*\frac{hr}{3600\ s}*\frac{mg}{1000\ \mu g}=0.0355\frac{\frac{mg}{m^3}}{\frac{lb}{hr}}$$

$$2.7E-02\frac{lb\ n-BAct}{hr}*0.0355\frac{mg/m^3}{lb/hr}=9.6E-04\frac{mg}{m^3}\ n-BAct$$

The n-Butyl Acetate emission concentration is less than the AAC regulatory limit of 35.5 mg/m^3.

$$9.6E-04\frac{mg}{m^3}\ n-BAct\Big/35.5\frac{mg}{m^3}\ n-BAct*100\%=0.003\%$$

4.2.2 Semiconductor Process TAP Emission Increase Regulatory Evaluation

Once baseline emission rates are established, emission increases will be used for regulatory evaluation. For evaluating TAP emission increases, the following equations are used:

$$TAPi = \frac{TAPm}{Hm} - B$$

$$TAPie = \frac{AAC * 0.95 * 1000\,{}^{\mu g}/_{mg}}{{}^{Chi_{24hr}}/_{Q}}$$

$$TAPie = \frac{AACC * 0.95}{{}^{Chi_{annual}}/_{Q}}$$

TAP_i = Calculated increase in hourly emission rate (lb/hr)
TAP_m = Calculated monthly emission rate (lb/month)
H_m = Hours of operation per month (hr/month)
B = Baseline hourly emission rate (established in permit) (lb/hr). If no baseline emission rate established, then B = 0.
TAP_{ie} = Increase in hourly emissions that triggers a refined modeling analysis (lb/hr)
AAC = Acceptable ambient concentration for non-carcinogens (mg/m^3)
AACC = Acceptable ambient concentration for carcinogens ($\mu g/m^3$)
$Chi_{24\text{-}hr}/Q$ = Chi/Q value for 24-hour averaging period = 35.5 ($\mu g/m^3$)/(lb/hr)
Chi_{annual}/Q = Chi/Q value for 24-hour averaging period = 1.32 ($\mu g/m^3$)/(lb/hr)

TAP AAC and AACC evaluations for the boilers and emergency generators are based on the individual stack Chi/Q and are calculated the same way as the criteria pollutant emission concentrations. See Section 8.0 for an example of how the concentrations were calculated for boiler and emergency generator TAPs.

4.2.3 Fluorides

A number of different compounds containing fluorine are used in the fabrication areas. These compounds can be divided into two classes: fluorine-containing gases used as dry etchants and dopants and fluorine-containing liquids used in wet chemical stations as cleaners and etchants.

Some of these fluorine-containing compounds are listed as TAPS individually, as well as fluoride compounds in terms of fluorine.

<u>Gases</u>
The fluorine-containing gases are processed in a plasma environment to create free radicals. In etching, the fluorine ion will etch the wafer surface. In doping, ions generated by the decomposition of the doping gas will penetrate into the wafer. In both

cases, free fluorine ions subsequently react to form hydrogen fluoride (HF). The HF is then vented to a scrubber.

To estimate fluorine-containing gas emissions, the plasma conversion efficiency to HF is conservatively estimated at 90%. The unconverted gases are conservatively assumed to pass through scrubbers or any other abatement devices unchanged and into the atmosphere.

Liquids
The fluorine-containing liquids are used in wet chemical stations in the process area for etching and cleaning. Vapors from these stations are routed to scrubbers. Spent liquid is piped to the water treatment area.

The wet chemical station emission factor is applied to determine vapor emissions. Emissions from liquid chemicals containing fluorine is calculated the same as gaseous fluorine containing compounds. The removal efficiency of the subsequent process area acid scrubbers is conservatively estimated at 90%.

Hydrogen Fluoride emissions are calculated using the following equations for determining controlled and uncontrolled emissions.

HF Formation Equation:
Uncontrolled HF Emission Rate (lb/hr) = Σchemical usage (lb/hr) * EF * Conversion Efficiency * HF formation Ratio

Controlled HF Baseline Emission Rate (lb/hr) = ΣUncontrolled HF Emission Rate * (1 – Scrubber Efficiency)

The formation ratio for each chemical is provided in Table 8.

Table 8. Formation Ratios for Fluorine Containing Chemicals

Chemical	Forms	Ratio
Ammonium Fluoride	HF	0.541
Boron Trifluoride	HF	0.882
Hexafluoroethane	HF	0.870
Nitrogen Trifluoride	HF	0.845
Octafluorocyclopentene	HF	0.755
Sulfur Hexafluoride	HF	0.821
Tetrafluoromethane	HF	0.909
Trifluoromethane	HF	0.588
Tungsten Hexafluoride	HF	0.403

Example Boron Trifluoride:

$$\left(20\ \frac{lb\ HF}{mol\ HF}\right) * \left(3\ \frac{mol\ HF}{mol\ BF^3}\right) * \left(\frac{molBF^3}{68\ lbs\ BF^3}\right) = 0.882 \frac{lb\ HF}{lb\ BF^3}$$

$$7.93\ E-04\ \frac{lbs}{hr}\ BF^3\ from\ Fab\ 9\ +\ 5.29E-04\ \frac{lbs}{hr}\ BF^3\ from\ Fab\ 10 = 1.322E-03\ \frac{lbs}{hr}\ BF^3$$

$$\left(1.322\ E-03\ \frac{lbs}{hr} BF^3\right) * 90\% EF * (90\%\ conversion\ efficiency)\ *\ 0.882\ = 9.44E-04\ \frac{lbs}{hr}\ HF\ Uncontrolled$$

$$(9.44E-04\ \frac{lbs}{hr}\ HF\ Uncontrolled\ PTE)\ *\ (1-90\%\ scrubber\ efficiency)\ = 9.44E-05 \frac{lbs}{hr} HF\ Controlled\ Baseline$$

$$Baseline\ BF^3 emission\ rate = 1.322E-03 \frac{lbs}{hr} BF^3 * (90\% EF) * (1-90\% conversion\ efficiency) * (1 - 90\%\ scrubber\ efficiency)\ = 1.19E-05 \frac{lbs}{hr} BF^3$$

The total controlled baseline emission rate of fluoride-containing constituents is calculated by summing the emissions of the gases that are used in etching and doping produced by the process conversion and/or abatement of those gases and the emissions of the liquids used in the wet chemical stations.

Projected Growth for BF^3:

$$1.19E-05 \frac{lb}{hr} BF^3 * 391{,}040 \frac{wafer\ starts}{yr} * \frac{yr}{217{,}601\ wafer\ starts} -1.19E-05 \frac{lb}{hr} BF^3 = 9.48E-06\ \frac{lbs}{hr} BF^3$$

PTE for BF^3:

$$1.19E-05 \frac{lb}{hr} BF^3 + 9.48E-06\ \frac{lbs}{hr} BF^3 = 2.14E-05 \frac{lbs}{hr} BF^3$$

4.2.4 Hydrogen Chloride

Hydrogen chloride (HCl) is used and generated in the fabrication areas. HCl gas and other chlorine-containing gases are used as dry etchants and dopants. Hydrochloric acid is used in wet

chemical stations as a cleaner and wet etchant.

Gases
The chlorine-containing gases are processed in a plasma environment to create free radicals. In etching, the chlorine ion will etch the wafer surface. In doping, ions produced by the decomposition of the gas will penetrate into the wafer. In both cases, the chlorine ions subsequently react to form HCl. The HCl is then vented to a scrubber.

To estimate the emissions of the HCl produced in plasma processes, the plasma conversion efficiency of the chlorine-containing gases is estimated at 100% to maximize HCl formation. The removal efficiency of the subsequent process area acid scrubbers is conservatively estimated at 90%.

Liquids
Hydrochloric acid is used in wet chemical stations in the process area for etching and cleaning. Vapors from these stations are routed to scrubbers. Spent liquid is piped to the water treatment area.

To calculate air emissions, the vaporization rate is conservatively estimated at 30% (see Table 6). Subsequent process area wet scrubber efficiency is estimated at 90%. Therefore, overall wet chemical station acid emissions are 3%. Since the Bay Area Air Quality Management District (BAAQMD) recommends assuming negligible emissions for wet chemical stations abated by a wet scrubber,[7] this is a very conservative estimate.

Hydrogen Chloride emissions are calculated using the following equations for determining controlled and uncontrolled emissions.

HCl Formation Emissions:
Uncontrolled HCl Emission Rate (lb/hr) = Σchemical usage (lb/hr) * EF * Conversion Efficiency * HCl formation Ratio

Controlled HCl Baseline Emissions (lb/hr) = ΣUncontrolled HCl Emission Rate * (1 – Scrubber Efficiency)

The formation ratio for each chemical is provided in Table 9.

Table 9. Formation Ratios for Chlorine Containing Chemicals

Chemical	Forms	Ratio
Boron Trichloride	HCl	0.933
Chlorine	HCl	1.028
Chloroform	HCl	0.916
Dichlorosilane	HCl	0.722
Phosphorus Oxychloride	HCl	0.714

[7] See Footnote 6.

Example Boron Trichloride:

$$\left(36.26\ \frac{lb\ HCl}{mol\ HCl}\right) * \left(3\ \frac{mol\ HCl}{mol\ BCl^3}\right) * \left(\frac{molBCl^3}{117.2\ lbs\ BCl^3}\right) = 0.933\frac{lb\ HCl}{lb\ BCl^3}$$

$$BCL^3\ emissions = 4.79\ E-02\ \frac{lbs}{hr}BCl^3\ from\ Fab\ 9 + 6.39\ E-02\ \frac{lbs}{hr}BCl^3\ from\ Fab\ 10$$
$$= 1.12\text{E}-02\frac{\text{lbs}}{\text{hr}}\text{BCl}^3$$

$$1.12\ E-01\ \frac{lbs\ BCl3}{hr} * (90\%EF) * (100\%\ conversion\ to\ HCl) * 0.933\frac{lbs\ HCl}{lbs\ BCl^3}$$
$$=\ 9.40\ E-02\ \frac{lbs}{hr}\ HCl\ Uncontrolled\ Emision\ Rate$$

$$(9.40\ E-02\ \frac{lbs}{hr}HCl\ uncontrolled) * (1-0.90\ Scrubber\ efficiency)$$
$$=\ 9.40\ E-03\ lbs/hr\ HCl\ Controlled\ Baseline$$

The total controlled baseline emission rate is calculated by summing the controlled emissions of the hydrogen chloride fed to and produced by the fabrication processes, and the controlled emissions of the hydrochloric acid used in wet chemical stations. Projected growth for HCl is calculated the same as described for BF^3 above.

5.0 PM_{10} AND $PM_{2.5}$

Particulate matter is emitted from wastewater processing, fuel burning equipment, and the cooling towers. For the most part, particulate matter size was differentiated based on AP-42 emission factor information. For the boilers and emergency generators, AP-42 indentified all particulate matter to be less than 1.0 micrometer in diameter. Therefore, the particulate emission factor provided in Sections 1.0 and 2.0 could be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. For this application, particulate matter identified as being 2.5 micrometers in diameter or less was calculated and modeled as $PM_{2.5}$. For the cooling towers, AP 42 identified all PM emitted from cooling towers to be PM_{10}. Therefore, the calculations and modeling assume all cooling tower PM emission are PM_{10} emissions. Particulate matter emitted during wastewater processing was assumed to be PM_{10}.

Calcium carbonate, filter powder, and flocculent are used inside the water treatment building. These powders are manually dumped from bags into the process. To estimate PM_{10} emissions, all of the controlled PTE rates of these constituents are assumed to be entirely PM_{10} and unloading of the powders is assumed to occur simultaneously. These compounds are added in batch amounts; conservative addition rates were used to determine the hourly rate and are provided in Table 10.

Table 10. Wastewater Treatment Facility Operations Rate and Emission Factors

Chemical	Operations	Emission Factor
Calcium	75 Batch Operations per year at 1 hour per batch[a]	1%
Filter Powder	75 Batch Operations per year at 1 hour per batch[a]	1%
Nalclear	75 Batch Operations per year at 1 hour per batch[a]	1%
Lithium Hypochlorite	104 Batch Operations per year at 0.5 hour per batch[b]	1%
Lime	4 Batch Filling Operations per year at 1 hour per batch[c]	0.00005%[d]

[a] In 2007 batch unloading, which corresponds to filter cake batch production runs, occurred approximately once per week (or 52 times a year). At maximum production rates it is projected that the batch water treatment operations would occur approximately 40% more often.
[b] Lithium hypochlorite is added to the wastewater treatment facility scrubber occurring approximately one to two times per week. At maximum production rates it is projected that the batch water treatment operations would twice a week.
[c] Lime is delivered and offloaded into the silo by truck quarterly.
[d] Lime silo and feed bin emissions are considered inconsequential.[8] The validity of this determination is confirmed by estimating emissions generated during silo loading. The AP-42 emission factor for unloading into a silo equipped with a filter is 0.00099 lb PM total/ton of material loaded (equivalent to an EF of 0.00005%). AP-42, Chapter 11, Table 11.12-2, October 2001

The general exhaust for the water treatment building is vented through a wet scrubber. The scrubber liquid will help capture particulate matter before it is released to the atmosphere. The air entrainment during unloading of all powders used in the wastewater treatment facility is estimated at 1%. The scrubber particulate matter removal efficiency is conservatively estimated at 90%. Hydrated lime (calcium hydroxide) is used in a wastewater treatment process to precipitate fluoride and aid in pH adjustment. It is stored in a metal silo adjacent to Building F. The silo has a capacity of 65,000 lbs and is equipped with a bag filter assembly on top. The lime is fed directly into the water treatment process inside Building F as needed via a powder auger. As such, the silos particulate emissions are not routed through the wastewater treatment facility scrubber.

PM_{10} emissions for the wastewater treatment facility are calculated using the following formulas:

PM_{10} Uncontrolled Emission Rate (lbs/hr) = Chemical usage (lb/yr) * EF / (Number of batches per year) / (Number of hr per batch)

PM_{10} Controlled Baseline Emission Rate (lbs/hr) = Uncontrolled Emission Rate (lb/hr) * (1-Scrubber Efficiency)

Example Calcium Carbonate:

$$13{,}392\ \frac{lbs}{yr} * 1\% * \frac{yr}{75\ batchs} * \frac{batch}{1\ hr} = 1.79\ \frac{lbs}{hr} PM_{10}\ Uncontrolled\ Emission\ Rate$$

$$1.79 \frac{lbs}{hr} * (1 - 90\%\ scrubber\ efficiency) = 1.79E-01\ \frac{lbs}{hr} PM_{10} Controlled\ Baseline$$

[8] State of Idaho Air Quality Modeling Guideline, Sections 5.3 and 5.3.2

6.0 FEC CALCULATIONS

FEC calculations for NOx, CO, SO_2, $PM_{2.5}$, and PM_{10} criteria pollutants are based on the addition of two new future boilers the same size as GBOISB1, 2, and 3 and two new future cooling towers the same size as GCT1 and GCT2. The new future boilers drive the NOx, CO, SO_2, and $PM_{2.5}$ FEC Proposed Growth calculations. The new future cooling towers drive the PM_{10} FEC Proposed Growth calculations.

FEC Emissions:
Operational $\text{Variability}_{\text{process}}$ = Process Baseline Emission Rate * (391,040 Maximum Wafer Starts/yr / 217,601 2007 Wafer Starts/yr) – Process Baseline Emission Rate

Proposed $\text{Growth}_{\text{process}}$ = (Process Baseline Emission Rate + Process Operational Variability) * 20%

Proposed $\text{Growth}_{\text{boilers}}$ = ∑GBOISB1, 2, & 3 Baseline Emissions * 66.67%

Proposed $\text{Growth}_{\text{PM10}}$ = ∑GCT1 & 2 Baseline Emissions * 100%

FEC = (Baseline Emission Rate + Operational Variability + Proposed Growth)

6.1 Example FEC for NOx

NOx Emissions for GBOISB1 = 0.62 lb/hr NOx
NOx Emissions for GBOISB2 = 0.62 lb/hr NOx
NOx Emissions for GBOISB3 = 0.62 lb/hr NOx

$$Baseline\ NOx\ Emissions_{for\ GBOISB1,2,3} = 0.62\frac{lbs}{hr}NOx + 0.62\frac{lbs}{hr}NOx + 0.62\frac{lbs}{hr}NOx$$
$$= 1.86\frac{lbs}{hr}NOx$$

$$Future\ NOx\ Emissions = 0.62\frac{lbs}{hr}NOx + 0.62\frac{lbs}{hr}NOx = 1.24\frac{lbs}{hr}NOx$$

$$Proposed\ Growth\ NOx\ Emissions\ Increase = \frac{1.24\frac{lbs}{hr}NOx}{1.86\frac{lbs}{hr}NOx} * 100\% = 66.67\%$$

$$Proposed\ Growth\ GBOISB1 = 0.62\frac{lbs}{hr}NOx * .6667 = 0.41\frac{lbs}{hr}NOx$$

The baseline criteria emissions for GBOISB1, 2, and 3 are each increased by 66.67% to account for the Proposed Growth component. An Operational Variability component for the boilers was not utilized.

$$NOx\ Emisssions\ FEC\ Proposed\ Growth$$
$$= 0.41\frac{lbs}{hr}NOx_{for\ GBOISB1} + 0.41\frac{lbs}{hr}NOx_{for\ GBOISB2} + 0.41\frac{lbs}{hr}NOx_{for\ GBOISB3}$$
$$= 1.23\frac{lbs}{hr}NOx * \frac{ton}{2000\ lbs} * 8760\frac{hr}{yr} = 5.39tpy\ NOx$$

Emergency Generators
ON is not expecting any additional emergency generator capacity. Therefore, no Operational Variability or Proposed Growth for the emergency generators was included in the emission estimate.

Total FEC for NOx
The FEC for NOx is based on the sum of all the baseline Boiler and Emergency Generator NOx emissions, the comfort heating units, and projected growth FEC component.

Baseline NOx Boilers = 25.24 tpy
Heating Units NOx = 1.26 tpy
Projected Growth NOx Boilers = 5.39 tpy
Baseline NOx Emergency Generators = 3.64 tpy

$$\sum FEC\ NOx = 25.24\ tpy_{boiler} + 1.26\ tpy_{heating\ unit} + 5.39\ tpy_{projected\ growth} + 3.64\ tpy_{EG} = 35.53\ tpy\ NOx$$

6.2 Example FEC Calculations for PM_{10}

The Operational Variability FEC component for PM_{10} is only based on the semiconductor process PM_{10} emission rates. Since ON already is accounting for operating the boilers, emergency generators, and cooling towers at their maximum operating times (i.e. 8,760 hours for the boilers and cooling towers and 100 hours for the emergency generators), there is no PM_{10} Operational Variability component being proposed for emissions associated with these pieces of equipment.

For the Proposed Growth FEC component, a 20% growth for manufacturing capabilities and for changes in process technologies (i.e. semiconductor processes) was used plus the PM_{10} emissions from the installation of two new future cooling towers.

6.2.1 Cooling Tower

The two future Cooling Towers are based on the design of GCT1 and GCT2.
PM_{10} Emissions for GCT1 = 0.568 lb/hr PM_{10}
PM_{10} Emissions for GCT2 = 0.568 lb/hr PM_{10}

$$Baseline\ PM_{10}\ Emissions_{for\ GCT1\ \&\ 2} = 0.568\frac{lbs}{hr}PM_{10} + 0.568\frac{lbs}{hr}PM_{10} = 1.136\frac{lbs}{hr}PM_{10}$$

$$Future\ PM_{10} Emissions =$$

$$0.568\frac{lbs}{hr}PM_{10} + 0.568\frac{lbs}{hr}PM_{10} = 1.136\frac{lbs}{hr}PM_{10}$$

$$Proposed\ Growth\ Emissions\ Increase = \frac{1.136\ {}^{lbs}/_{hr}\ PM_{10-future}}{1.136\ {}^{lbs}/_{hr}\ PM_{10-GCT1\&2}} * 100 = 100\%$$

$$Proposed\ Growth\ Emission\ Rate\ for\ GCT1 = 0.568\frac{lbs}{hr}PM_{10} * 100\% = 0.568\frac{lbs}{hr}PM_{10}$$

The baseline criteria emissions for GCT1 and GCT2 were each increased by 100% to account for the Proposed Growth component. An Operational Variability component for the cooling tower was not utilized.

$$Cooling\ Tower\ PM_{10}\ Emission\ FEC\ Proposed\ Growth$$
$$= 0.568\frac{lbs}{hr}PM_{10_{GCT1}} + 0.568\frac{lbs}{hr}PM_{10_{GCT2}} = 1.136\frac{lbs}{hr}PM_{10}$$
$$1.136\frac{lbs}{hr}PM_{10} * 8760\frac{hrs}{yr} * \frac{ton}{2000\ lbs} = 4.98\ tpy$$

6.2.2 Semiconductor Process

The Operational Variability and Proposed Growth components of the FEC for semiconductor process emitted PM_{10} and $PM_{2.5}$ were calculated based on the sum of all PM_{10} and $PM_{2.5}$ emissions, respectively.

Example PM_{10} FEC:
Total Baseline PM_{10} Fab 9 = 0 ton per year (tpy)
Total Baseline PM_{10} Fab 10 = 0 tpy
Total Baseline PM_{10} Facility = 1.483 tpy
Total Baseline PM_{10} Boilers = 0 tpy
Total Baseline PM_{10} Emergency Generators = 0.086 tpy
Total Baseline PM_{10} Cooling Towers = 11.09 tpy

$$Process\ PM_{10} = 0\ tpy_{Fab\ 9} + 0\ tpy_{Fab\ 10} + 1.483\ tpy_{facility} = 1.483\ tpy\ PM_{10}$$

$$Total\ Operational\ Growth$$
$$= 1.483\ tpy * 391{,}040\frac{wafer\ starts}{yr} * \frac{yr}{217{,}601\ wafer\ starts} - 1.483\ tpy$$
$$= 1.182\ tpy\ PM_{10}$$

$$Total\ Proposed\ Growth = (1.483\ tpy + 1.182\ tpy) * 20\% + 4.98 tpy_{Cooling\ Towers}$$
$$= 5.513 tpy\ PM_{10}$$

$$\begin{aligned} Total\ PM_{10}\ FEC \\ &= 0\ tpy_{Fab\ 9} + 0\ tpy_{Fab\ 10} + 1.483\ tpy_{facility} + 0\ tpy_{Boilers} \\ &+ 0.086\ tpy_{Emergency\ Generators} + 11.09\ tpy_{Cooling\ Towers} \\ &+ 1.182\ tpy_{Operational\ Variability} + 5.513\ tpy_{Proposed\ Growth} \\ &= 19.354\ tpy\ PM_{10} \end{aligned}$$

Example $PM_{2.5}$ FEC:
Total Baseline $PM_{2.5}$ Fab 9 = 0 ton per year (tpy)
Total Baseline $PM_{2.5}$ Fab 10 = 0 tpy
Total Baseline $PM_{2.5}$ Facility = 0 tpy
Total Baseline $PM_{2.5}$ Boilers = 2.659 tpy
Total Baseline $PM_{2.5}$ Emergency Generators = 0.001 tpy
Total Baseline $PM_{2.5}$ Cooling Towers = 0 tpy

$$Process\ PM_{2.5} = 0\ tpy_{Fab\ 9} + 0\ tpy_{Fab\ 10} + 0\ tpy_{facility} = 0\ tpy\ PM_{2.5}$$

$$Total\ Operational\ Growth = 0\ tpy\ PM_{2.5}$$

There is no operational growth proposed for $PM_{2.5}$ because the facility does not contribute the $PM_{2.5}$ emissions and the boilers are already assumed to operate at maximum capacity.

Proposed growth for $PM_{2.5}$ for the boilers is based on the FEC calculation methodology shown in Section 6.1 (the addition of two future boilers). The baseline $PM_{2.5}$ emissions for GBOIS1, 2, and 3 is 1.229 tpy. This is multiplied by 66.67% to obtain the proposed growth for $PM_{2.5}$

$$Total\ Proposed\ Growth = \left(1.229\ tpy_{GBOISB1,2,3}\right) * 66.67\% = 0.819 tpy\ PM_{2.5}$$

$$\begin{aligned} Total\ PM_{2.5}\ FEC \\ &= 0\ tpy_{Fab\ 9} + 0\ tpy_{Fab\ 10} + 0\ tpy_{facility} + 2.659\ tpy_{Boilers} \\ &+ 0.001\ tpy_{Emergency\ Generators} + 0\ tpy_{Cooling\ Towers} \\ &+ 0\ tpy_{Operational\ Variability} + 0.819\ tpy_{Proposed\ Growth} = 3.478\ tpy\ PM_{2.5} \end{aligned}$$

6.3 Example FEC for HAPs and VOCs

To determine Operational Variability, semiconductor process emission rates were calculated by multiplying the 2007 baseline emission rate by a ratio of the maximum projected wafer production rate to the 2007 wafer production rate. The 2007 baseline emission rate is based on 217,601 wafer starts per year (approximately 4,100 wafer starts per week) and ON's maximum production projection of 391,040 wafer starts per year (or approximately 7,400 wafer starts per week).[9] This equates to a 180% increase in VOC and HAP for the Operational Variability.

The Proposed Growth component is based on semiconductor process related activities and the

[9] E-mail Message from Staci O'Connell, ON, to Mark Torf, TORF Environmental Management, *Re: Wafer Numbers to use for Max. Capacity*, July 29, 2003.

two potential future boilers. For the semiconductor process, the Proposed Growth component for VOCs, and HAPs was based on an assumed 20% growth of process activities, either through replacement of outdated tools or growth of either Fab. The growth component for the boiler HAPs and VOCs is based on the installation of two new future boilers, or increased by 66.67% as described in Section 6.1.

FEC Emission for HAP and VOC:
Operational $\text{Variability}_{\text{process}}$ = Process Baseline HAP/VOC Emission Rate * (391,040 Maximum Wafer Starts/yr / 217,601 2007 Wafer Starts/yr) – HAP/VOC Baseline Emission Rate

Proposed $\text{Growth}_{\text{process}}$ = (Process Baseline HAP/VOC Emission Rate + Operational Variability) * 20%

Proposed $\text{Growth}_{\text{boilers}}$ = ∑GBOISB1, 2, & 3 Baseline HAP/VOC Emissions * 66.67%

HAP/VOC FEC = (HAP/VOC Baseline Emission Rate + Operational Variability + Proposed Growth)

Example Calculation for FEC HAPs:
Total HAP Fab 9 = 0.977 ton per year (tpy)
Total HAP Fab 10 = 1.851 tpy
Total HAP Facility = 0 tpy
Total HAP Boilers = 0.660 tpy
GBOISB1 HAP = 0.102 tpy
GBOISB2 HAP = 0.102 tpy
GBOISB3 HAP = 0.102 tpy
Total HAP Emergency Generators = 0.005 tpy
Total HAP Cooling Towers = 0 tpy

$$Proess\ HAPs = 0.977\ tpy_{Fab\ 9} + 1.851\ tpy_{Fab\ 10} + 0\ tpy_{facility} = 2.828\ tpy\ HAPs$$

$$\begin{aligned} Operational\ Growth \\ &= 2.828\ tpy * 391{,}040 \frac{wafer\ starts}{yr} * \frac{yr}{217{,}601\ wafer\ starts} - 2.828\ tpy \\ &= 2.254\ tpy \end{aligned}$$

$$Proposed\ Growth_{process} = (2.828\ tpy + 2.254\ tpy) * 20\% = 1.016\ tpy$$

$$\begin{aligned} Proposed\ Growth_{boiler} \\ &= (0.102\ tpy_{GBOISB1} + 0.102\ tpy_{GBOISB2} + 0.102\ tpy_{GBOISB3}) * 66.67\% \\ &= 0.204\ tpy \end{aligned}$$

$$Total\ HAP\ FEC = 0.977\ tpy_{Fab\ 9} + 1.851\ tpy_{Fab\ 10} + 0\ tpy_{facility} + 0.660\ tpy_{Boilers} + 0.005\ tpy_{Emergency\ Generators} + 0\ tpy_{Cooling\ Towers} + 2.254\ tpy_{Operational\ Variability} + 1.016\ tpy_{Proposed\ Growth_{facility}} + 0.204\ tpy_{Proposed\ Growth_{boiler}} = 6.967\ tpy\ HAP$$

7.0 AVERAGING TIMES

Multiple averaging times for different pollutants are required in order to demonstrate compliance for criteria pollutants and TAPs.

Example for Diesel Emergency Generator GEEMGEN:
The example provided is for sulfur dioxide emissions from the emergency generator. All the averaging calculations for the other criteria pollutants were conducted in the same manner. Operating duration is based on the length of time the source operates during the averaging period.

All of the emergency generators are assumed to operate 100 hours per year, with a maximum of 1 hour operation within a 24-hour duration. The example provided in Section 2.0 for GEEMGEN provided the maximum one hour emission rate for SO_2.

$$1 - hr\ SOx\ Emission\ Rate = 0.009 \frac{lbs}{hr} SOx$$

SO_2 has a regulatory requirement for 3-hr, 24-hr, and annual average. These are calculated as follows:

$$3 - hr\ SOx\ Emission\ Rate = 0.009 \frac{lbs}{hr} SOx * \frac{1 - hr\ operating\ duration}{3 - hour\ average} = 0.003 \frac{lbs}{hr} SOx$$

$$24 - hr\ SOx\ Emission\ Rate = 0.009 \frac{lbs}{hr} SOx * \frac{1 - hr\ operating\ duration}{24 - hour\ average} = 0.0004 \frac{lbs}{hr} SOx$$

$$Annual\ SOx\ Emission\ Rate = 0.009 \frac{lbs}{hr} SOx * \frac{100\ operating\ duration}{8760\ hours\ annually} = 0.00001 \frac{lbs}{hr} SOx$$

Example for Cooling Tower GCT1:
The cooling towers operating times are provided in Table 11. All of the cooling towers (or combinations thereof) are assumed to operate at these on-line ratings, with a maximum of 24-hours of operation within a 24-hour duration. The example from Section 6.2 shows the FEC calculation of PM_{10} for GCT1.

Table 11. Cooling Tower Operating Limits

Location	Unit ID(s)	On-line Rating Used for PTE (hrs/yr)	Remarks
Building B	BCT1 and BCT2	13,140	Assumed one tower operates year round and one is on
Building C	CCT1 and CCT2	13,140	Assumed one tower operates year round and one is on
Building D	DCT1 and DCT2	13,140	Assumed one tower operates year round and one is on-line for 6 months of the year.
Building G	GCT1	8,760	Assumed to operate year round.
Building G	GCT2	8,760	Assumed to operate year round.

$$1-hr\ PM_{10}\ Emission\ Rate_{GCT1} = 1.136\frac{lbs}{hr}PM_{10}$$

$$24-hr\ PM_{10}\ Emission\ Rate_{GCT1} = 1.136\frac{lbs}{hr}PM_{10} * \frac{24-hr\ operating\ duration}{24-hour\ average}$$
$$= 1.136\frac{lbs}{hr}PM_{10}$$

$$Annual\ PM_{10}\ Emission\ Rate_{GCT1} = 1.136\frac{lbs}{hr}PM_{10} * \frac{8760-hr\ operating\ duration}{8760\ hours\ annually}$$
$$= 1.136\frac{lbs}{hr}PM_{10}$$

For Cooling Tower DCT2, where the annual operation is only for half a year or 4,380 hrs, the annual average calculation is:

$$Annual\ PM_{10}\ Emission\ Rate_{DCT2} = 0.338\frac{lbs}{hr}PM_{10} * \frac{4380-hr\ operating\ duration}{8760\ hours\ annually}$$
$$= 0.169\frac{lbs}{hr}PM_{10}$$

8.0 DATABASE CALCULATIONS

Each stack and emission source is modeled in AERMOD assuming a unit release rate (1 g/s). Concentrations are calculated at 3691 discrete and 18 fence line receptors. For each model averaging time (1-hour, 8-hour, 24-hour, and annual), the highest concentration (based on a unit release rate) for the averaging time at each receptor is output for a given stack. For example, the stack ABOI will have output values at all 3709 receptors for 1-hour, 8-hour, 24-hour, and annual averaging times or 3709 × 4 = 14836 values. These concentrations are then scaled to the actual release rate for each pollutant as given by

$$\chi_{i,j,k,l} = DF_{i,j,l} Q_{j,k} \quad (1)$$

Where:

$\chi_{i,j,k,l}$ = concentration for receptor *i*, stack *j*, pollutant *k*, and averaging time *l* (g/m^3)
$DF_{i,j,l}$ = dispersion factor for receptor *i*, stack *j*, and averaging time *l* (s/m^3),
$Q_{j,k}$ = release rate for stack j and pollutant k (g/s).

The dispersion factor ($DF_{i,j,l}$) is commonly referred to as the χ/Q value (concentration divided by source term) and is the concentration output by AERMOD for the specified stack, receptor and averaging time (g/m^3) divided by the unit release rate (1 g/s) yielding units of s/m^3.

The total concentration of a given pollutant from all operations is calculated by:

$$X_{i,k,l} = \sum_{j=1}^{n} \chi_{i,j,k,l} \quad (2)$$

where $X_{i,k,l}$ = the total concentration at receptor *i* for pollutant *k* and averaging time *l* (g/m^3), and *n* is the number of sources emitting pollutant *k*.

The maximum concentration across all receptors for a given pollutant and averaging time is calculated by:

$$X\max_{k,l} = \max(X_{i,k,l}) \quad (3)$$

where $Xmax_{k,l}$ = the maximum concentration across all receptors for pollutant *k* and averaging time *l* (g/m^3).

The database example tables below are populated by AERMOD output and other information including 1) a list of all emission points, 2) the emission rate of each pollutant from all emission points, 3) all receptor locations, and 4) the averaging times considered. These tables are then used with the queries to determine pollutant concentrations at each receptor for a given averaging time. Three dots shown in the last row indicate that the table continues and only a sample of the data contained in the table is shown.

Dispersion Factor for each Source each Receptor and each Averaging Time:

ChiQ				
RecID	AvgTime	Stack	ChiQ	Units
1	1-HR	ABOI	4.4734E-06	s/m^3
1	1-HR	BBOIHWB	3.5639E-06	s/m^3
1	1-HR	BBOIST1	2.6438E-06	s/m^3
…	…	…	…	…

Maximum Individual Emission Rate per Pollutant, Source, and Averaging Time (in g/s):

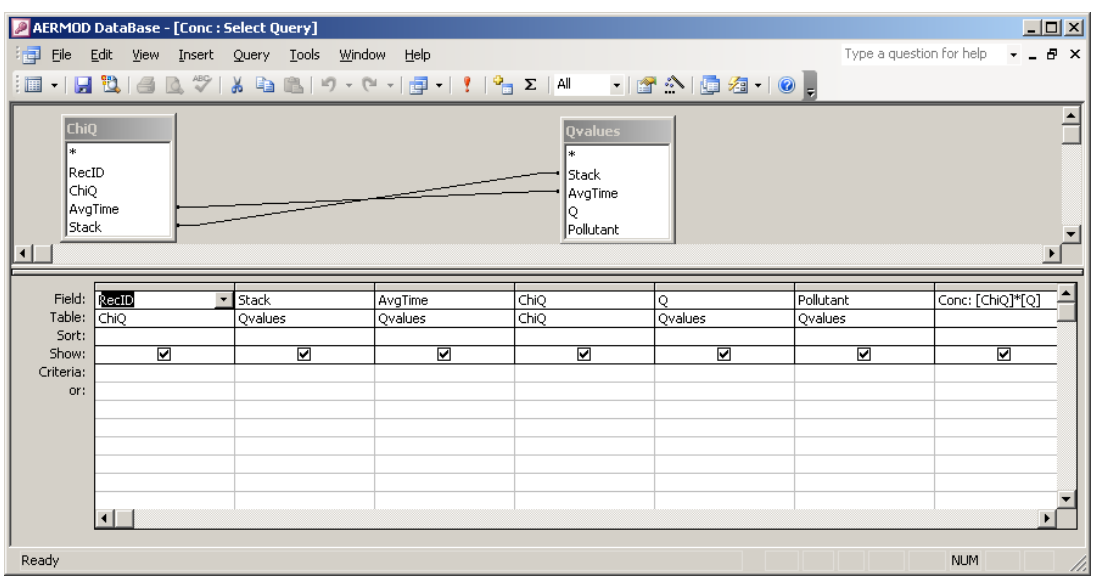
Qvalues			
Stack	AvgTime	Q	Pollutant
ABOI	ANNUAL	0.011	NOx
BBOIHWB	ANNUAL	0.109	NOx
BBOIST1	ANNUAL	0.095	NOx
…	…	…	…

Receptor Coordinates:

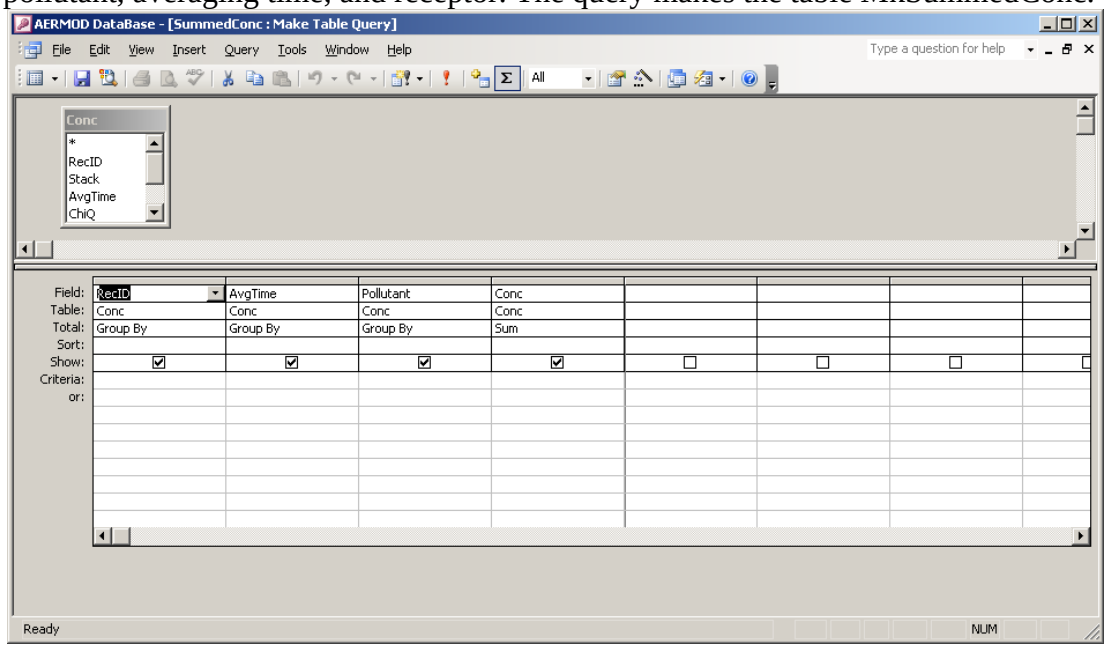
Receptor			
RecNum	UTME	UTMN	ELEV
1	384628	4746888	1438
2	384614	4746877	1439
3	384601	4746865	1439
…	…	…	…

Queries are used to process, sort, group, and filter the data contained in the tables. The primary query is the concentration query. This query calculates the concentration at each receptor location from each emission source and pollutant and for each averaging time. Subsequent questing uses this query or data subsets of this query to find maximum concentrations and location of maximum concentrations.

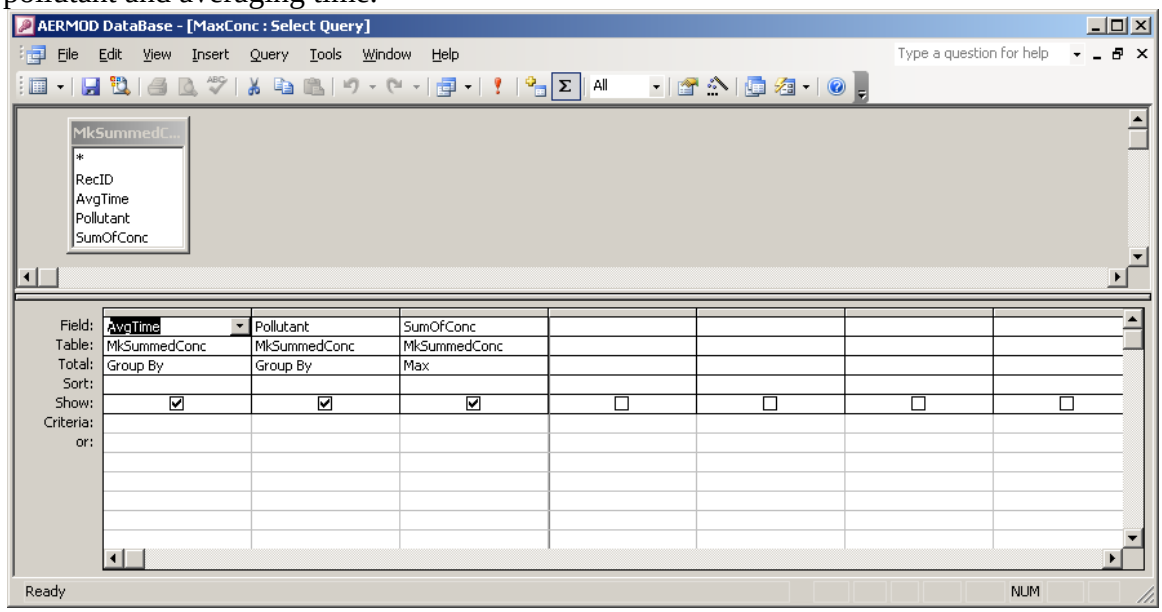
Query Conc: Calculates concentration at each receptor location for each emission source, averaging time and pollutant. The concentration is the product of the ChiQ (s/m^3) and Q (g/s) yielding the concentration (g/m^3).



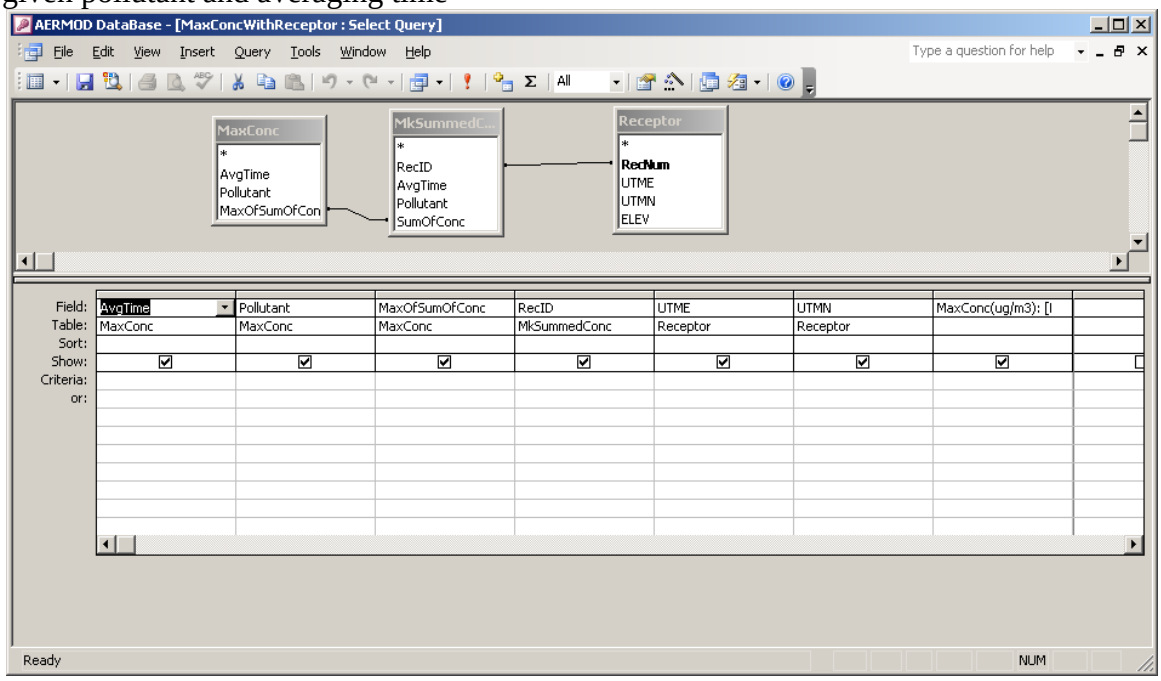
Query SummedConc: Sums concentration across all emission sources and groups results by pollutant, averaging time, and receptor. The query makes the table MkSummedConc.



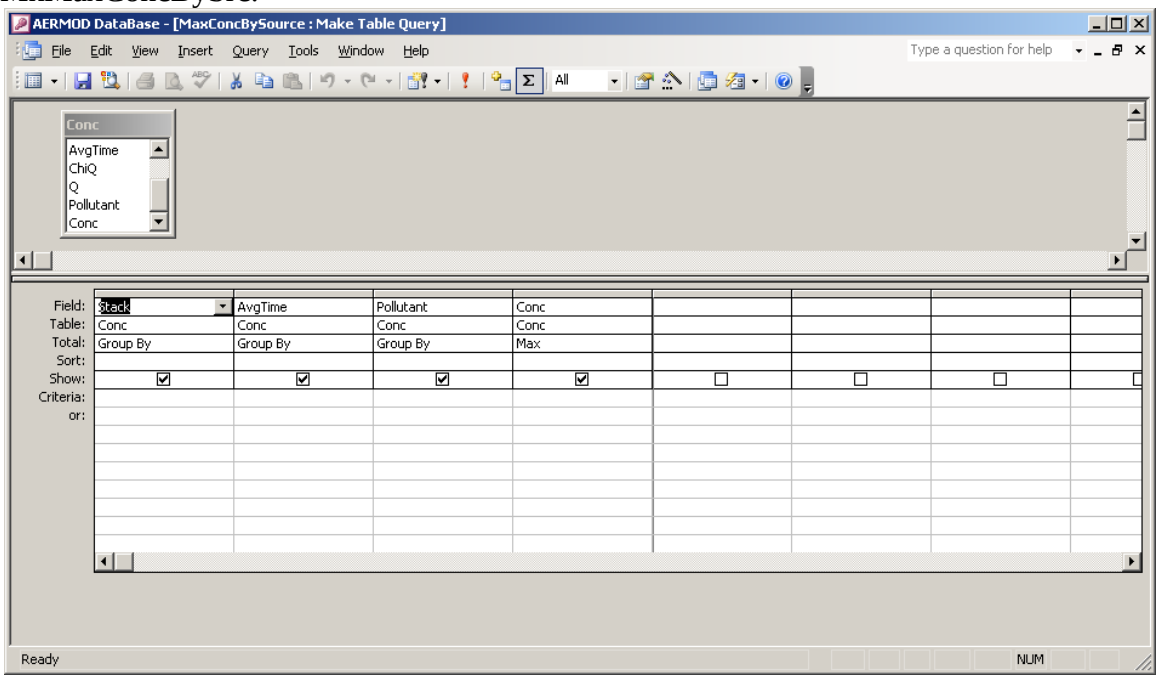
Query MaxConc: Finds the maximum concentration across all receptors and groups results by pollutant and averaging time.



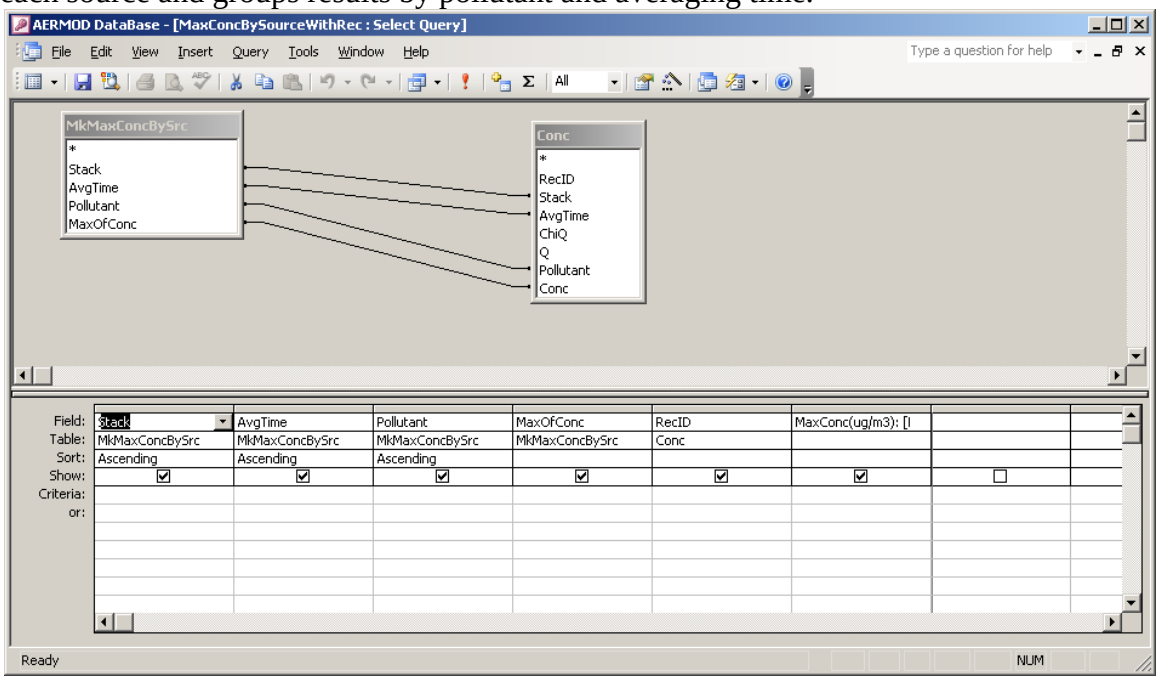
Query MaxConcWithReceptor: Finds the receptor with the maximum concentration for a given pollutant and averaging time



Query MaxConcBySource: Finds the maximum concentration across all receptors and groups results by emission source, averaging time, and pollutant. The query makes the table MkMaxConcBySrc.



Query MaxConcBySourceWithRec: Finds the receptor with the maximum concentration for each source and groups results by pollutant and averaging time.



Appendix F1

Calculations

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Boiler Emissions

ON Semiconductors, Pocatello, ID

Fuel Burning Equipment - Boilers

Location	Unit ID	Manufacturer Model Number	Install Year	Rated Output[3] HP	Rated Output[3] MMBtu per Hr	On-line Rating Actual	On-line Rating Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	lb/MMBtu	Baseline Emission Rate lbs/hr	Baseline Emission Rate tons/yr	Remarks	% Increase for Heating Units 5% lbs/hr	% Increase for Heating Units 5% tons/yr	Increase for FEC[4] or Potential Growth lbs/hr	Increase for FEC[4] or Potential Growth tons/yr	Total Emissions lbs/hr	Total Emissions tons/yr
				A = B *1E6/33475	B = A*33475/1E+06		C	D	E = B*1E+06/D/Eff			F	G = E*D/1E+06*F	H = C*G/2000		I = G*.05	J = I*C/2000	K = I*(.6667)	L=K*C/2000	M = G + I + K	N = H + J +L
Building A	ABOI Boiler	Teledyne Laars PH0850 IN0 9K01	1987	20.6	0.69	4,380	8,760	Natural Gas @ 1020 BTU/CF	833	NO_x	1.4-1.	9.80E-02	8.33E-02	3.65E-01	Hot water boiler, winter service only. 81% efficiency per manufacturer. AP-42 class: small boiler, uncontrolled.	4.17E-03	1.83E-02	0.00E+00	0.00E+00	8.75E-02	3.83E-01
										CO	1.4-1.	8.24E-02	7.00E-02	3.07E-01		3.50E-03	1.53E-02	0.00E+00	0.00E+00	7.35E-02	3.22E-01
										SO_2	1.4-2.	5.88E-04	5.00E-04	2.19E-03		2.50E-05	1.10E-04	0.00E+00	0.00E+00	5.25E-04	2.30E-03
										VOC	1.4-2.	5.39E-03	4.58E-03	2.01E-02		2.29E-04	1.00E-03	0.00E+00	0.00E+00	4.81E-03	2.11E-02
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	6.33E-03	2.77E-02		3.17E-04	1.39E-03	0.00E+00	0.00E+00	6.65E-03	2.91E-02
										HAPs	–	–	1.57E-03	6.89E-03		7.86E-05	3.44E-04	0.00E+00	0.00E+00	1.65E-03	7.23E-03
										Benzene	1.4-3	2.06E-06	1.75E-06	7.67E-06		8.75E-08	3.83E-07	0.00E+00	0.00E+00	1.84E-06	8.05E-06
										Benzo(a)pyrene	1.4-3	1.18E-09	1.00E-09	4.38E-09		5.00E-11	2.19E-10	0.00E+00	0.00E+00	1.05E-09	4.60E-09
										Formaldehyde	1.4-3	7.35E-05	6.25E-05	2.74E-04		3.13E-06	1.37E-05	0.00E+00	0.00E+00	6.56E-05	2.87E-04
										Hexane	1.4-3	1.76E-03	1.50E-03	6.57E-03		7.50E-05	3.29E-04	0.00E+00	0.00E+00	1.58E-03	6.90E-03
										3-Methylcholanthrene	1.4-3	1.76E-09	1.50E-09	6.57E-09		7.50E-11	3.29E-10	0.00E+00	0.00E+00	1.58E-09	6.90E-09
										Naphthalene	1.4-3	5.98E-07	5.08E-07	2.23E-06		2.54E-08	1.11E-07	0.00E+00	0.00E+00	5.34E-07	2.34E-06
										Pentane	1.4-3	2.55E-03	2.17E-03	9.49E-03		1.08E-04	4.75E-04	0.00E+00	0.00E+00	2.28E-03	9.96E-03
										Toluene	1.4-3	3.33E-06	2.83E-06	1.24E-05		1.42E-07	6.21E-07	0.00E+00	0.00E+00	2.98E-06	1.30E-05
										Arsenic	1.4-4	1.96E-07	1.67E-07	7.30E-07		8.33E-09	3.65E-08	0.00E+00	0.00E+00	1.75E-07	7.67E-07
										Barium	1.4-4	4.31E-06	3.67E-06	1.61E-05		1.83E-07	8.03E-07	0.00E+00	0.00E+00	3.85E-06	1.69E-05
										Cadmium	1.4-4	1.08E-06	9.17E-07	4.02E-06		4.58E-08	2.01E-07	0.00E+00	0.00E+00	9.63E-07	4.22E-06
										Chromium	1.4-4	1.37E-06	1.17E-06	5.11E-06		5.83E-08	2.56E-07	0.00E+00	0.00E+00	1.23E-06	5.37E-06
										Cobalt	1.4-4	8.24E-08	7.00E-08	3.07E-07		3.50E-09	1.53E-08	0.00E+00	0.00E+00	7.35E-08	3.22E-07
										Copper	1.4-4	8.33E-07	7.08E-07	3.10E-06		3.54E-08	1.55E-07	0.00E+00	0.00E+00	7.44E-07	3.26E-06
										Manganese	1.4-4	3.73E-07	3.17E-07	1.39E-06		1.58E-08	6.94E-08	0.00E+00	0.00E+00	3.33E-07	1.46E-06
										Mercury	1.4-4	2.55E-07	2.17E-07	9.49E-07		1.08E-08	4.75E-08	0.00E+00	0.00E+00	2.28E-07	9.96E-07
										Molybdenum	1.4-4	1.08E-06	9.17E-07	4.02E-06		4.58E-08	2.01E-07	0.00E+00	0.00E+00	9.63E-07	4.22E-06
										Nickel	1.4-4	2.06E-06	1.75E-06	7.67E-06		8.75E-08	3.83E-07	0.00E+00	0.00E+00	1.84E-06	8.05E-06
										Zinc	1.4-4	2.84E-05	2.42E-05	1.06E-04		1.21E-06	5.29E-06	0.00E+00	0.00E+00	2.54E-05	1.11E-04
Building B	BBOIHWB Boiler (AMIS: HWB-1)	Sellers 15 Senior S-200-W	1990	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	NO_x	1.4-1.	9.80E-02	8.20E-01	3.59E+00	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.	4.10E-02	1.80E-01	0.00E+00	0.00E+00	8.61E-01	3.77E+00
										CO	1.4-1.	8.24E-02	6.89E-01	3.02E+00		3.45E-02	1.51E-01	0.00E+00	0.00E+00	7.24E-01	3.17E+00
										SO_2	1.4-2.	5.88E-04	4.92E-03	2.16E-02		2.46E-04	1.08E-03	0.00E+00	0.00E+00	5.17E-03	2.26E-02
										VOC	1.4-2.	5.39E-03	4.51E-02	1.98E-01		2.26E-03	9.88E-03	0.00E+00	0.00E+00	4.74E-02	2.08E-01
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	6.24E-02	2.73E-01		3.12E-03	1.37E-02	0.00E+00	0.00E+00	6.55E-02	2.87E-01
										HAPs	–	–	1.55E-02	6.78E-02		7.74E-04	3.39E-03	0.00E+00	0.00E+00	1.63E-02	7.12E-02
										Benzene	1.4-3	2.06E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	0.00E+00	0.00E+00	1.81E-05	7.92E-05
										Benzo(a)pyrene	1.4-3	1.18E-09	9.85E-09	4.31E-08		4.92E-10	2.16E-09	0.00E+00	0.00E+00	1.03E-08	4.53E-08
										Formaldehyde	1.4-3	7.35E-05	6.15E-04	2.70E-03		3.08E-05	1.35E-04	0.00E+00	0.00E+00	6.46E-04	2.83E-03
										Hexane	1.4-3	1.76E-03	1.48E-02	6.47E-02		7.38E-04	3.23E-03	0.00E+00	0.00E+00	1.55E-02	6.79E-02
										3-Methylcholanthrene	1.4-3	1.76E-09	1.48E-08	6.47E-08		7.38E-10	3.23E-09	0.00E+00	0.00E+00	1.55E-08	6.79E-08
										Naphthalene	1.4-3	5.98E-07	5.00E-06	2.19E-05		2.50E-07	1.10E-06	0.00E+00	0.00E+00	5.26E-06	2.30E-05
										Pentane	1.4-3	2.55E-03	2.13E-02	9.34E-02		1.07E-03	4.67E-03	0.00E+00	0.00E+00	2.24E-02	9.81E-02
										Toluene	1.4-3	3.33E-06	2.79E-05	1.22E-04		1.39E-06	6.11E-06	0.00E+00	0.00E+00	2.93E-05	1.28E-04
										Arsenic	1.4-4	1.96E-07	1.64E-06	7.19E-06		8.20E-08	3.59E-07	0.00E+00	0.00E+00	1.72E-06	7.55E-06
										Barium	1.4-4	4.31E-06	3.61E-05	1.58E-04		1.81E-06	7.91E-06	0.00E+00	0.00E+00	3.79E-05	1.66E-04
										Cadmium	1.4-4	1.08E-06	9.03E-06	3.95E-05		4.51E-07	1.98E-06	0.00E+00	0.00E+00	9.48E-06	4.15E-05
										Chromium	1.4-4	1.37E-06	1.15E-05	5.03E-05		5.74E-07	2.52E-06	0.00E+00	0.00E+00	1.21E-05	5.28E-05
										Cobalt	1.4-4	8.24E-08	6.89E-07	3.02E-06		3.45E-08	1.51E-07	0.00E+00	0.00E+00	7.24E-07	3.17E-06
										Copper	1.4-4	8.33E-07	6.97E-06	3.05E-05		3.49E-07	1.53E-06	0.00E+00	0.00E+00	7.32E-06	3.21E-05
										Manganese	1.4-4	3.73E-07	3.12E-06	1.37E-05		1.56E-07	6.83E-07	0.00E+00	0.00E+00	3.27E-06	1.43E-05
										Mercury	1.4-4	2.55E-07	2.13E-06	9.34E-06		1.07E-07	4.67E-07	0.00E+00	0.00E+00	2.24E-06	9.81E-06
										Molybdenum	1.4-4	1.08E-06	9.03E-06	3.95E-05		4.51E-07	1.98E-06	0.00E+00	0.00E+00	9.48E-06	4.15E-05
										Nickel	1.4-4	2.06E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	0.00E+00	0.00E+00	1.81E-05	7.92E-05
										Zinc	1.4-4	2.84E-05	2.38E-04	1.04E-03		1.19E-05	5.21E-05	0.00E+00	0.00E+00	2.50E-04	1.09E-03
Building B	BBOIST Boiler (AMIS: ST-1)	Sellers 15 Senior 175 HP	1995	175	5.86	8,760	8,760	Natural Gas @ 1020 BTU/CF	7,179	NO_x	1.4-1.	9.80E-02	7.18E-01	3.14E+00	Steam boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.	3.59E-02	1.57E-01	0.00E+00	0.00E+00	7.54E-01	3.30E+00
										CO	1.4-1.	8.24E-02	6.03E-01	2.64E+00		3.02E-02	1.32E-01	0.00E+00	0.00E+00	6.33E-01	2.77E+00
										SO_2	1.4-2.	5.88E-04	4.31E-03	1.89E-02		2.15E-04	9.43E-04	0.00E+00	0.00E+00	4.52E-03	1.98E-02
										VOC	1.4-2.	5.39E-03	3.95E-02	1.73E-01		1.97E-03	8.65E-03	0.00E+00	0.00E+00	4.15E-02	1.82E-01
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	5.46E-02	2.39E-01		2.73E-03	1.19E-02	0.00E+00	0.00E+00	5.73E-02	2.51E-01
										HAPs	–	–	1.35E-02	5.93E-02		6.77E-04	2.97E-03	0.00E+00	0.00E+00	1.42E-02	6.23E-02
										Benzene	1.4-3	2.06E-06	1.51E-05	6.60E-05		7.54E-07	3.30E-06	0.00E+00	0.00E+00	1.58E-05	6.93E-05
										Benzo(a)pyrene	1.4-3	1.18E-09	8.61E-09	3.77E-08		4.31E-10	1.89E-09	0.00E+00	0.00E+00	9.05E-09	3.96E-08
										Formaldehyde	1.4-3	7.35E-05	5.38E-04	2.36E-03		2.69E-05	1.18E-04	0.00E+00	0.00E+00	5.65E-04	2.48E-03
										Hexane	1.4-3	1.76E-03	1.29E-02	5.66E-02		6.46E-04	2.83E-03	0.00E+00	0.00E+00	1.36E-02	5.94E-02
										3-Methylcholanthrene	1.4-3	1.76E-09	1.29E-08	5.66E-08		6.46E-10	2.83E-09	0.00E+00	0.00E+00	1.36E-08	5.94E-08
										Naphthalene	1.4-3	5.98E-07	4.38E-06	1.92E-05		2.19E-07	9.59E-07	0.00E+00	0.00E+00	4.60E-06	2.01E-05
										Pentane	1.4-3	2.55E-03	1.87E-02	8.18E-02		9.33E-04	4.09E-03	0.00E+00	0.00E+00	1.96E-02	8.58E-02
										Toluene	1.4-3	3.33E-06	2.44E-05	1.07E-04		1.22E-06	5.35E-06	0.00E+00	0.00E+00	2.56E-05	1.12E-04
										Arsenic	1.4-4	1.96E-07	1.44E-06	6.29E-06		7.18E-08	3.14E-07	0.00E+00	0.00E+00	1.51E-06	6.60E-06
										Barium	1.4-4	4.31E-06	3.16E-05	1.38E-04		1.58E-06	6.92E-06	0.00E+00	0.00E+00	3.32E-05	1.45E-04
										Cadmium	1.4-4	1.08E-06	7.90E-06	3.46E-05		3.95E-07	1.73E-06	0.00E+00	0.00E+00	8.29E-06	3.63E-05
										Chromium	1.4-4	1.37E-06	1.01E-05	4.40E-05		5.03E-07	2.20E-06	0.00E+00	0.00E+00	1.06E-05	4.62E-05
										Cobalt	1.4-4	8.24E-08	6.03E-07	2.64E-06		3.02E-08	1.32E-07	0.00E+00	0.00E+00	6.33E-07	2.77E-06
										Copper	1.4-4	8.33E-07	6.10E-06	2.67E-05		3.05E-07	1.34E-06	0.00E+00	0.00E+00	6.41E-06	2.81E-05
										Manganese	1.4-4	3.73E-07	2.73E-06	1.19E-05		1.36E-07	5.97E-07	0.00E+00	0.00E+00	2.86E-06	1.25E-05
										Mercury	1.4-4	2.55E-07	1.87E-06	8.18E-06		9.33E-08	4.09E-07	0.00E+00	0.00E+00	1.96E-06	8.58E-06
										Molybdenum	1.4-4	1.08E-06	7.90E-06	3.46E-05		3.95E-07	1.73E-06	0.00E+00	0.00E+00	8.29E-06	3.63E-05
										Nickel	1.4-4	2.06E-06	1.51E-05	6.60E-05		7.54E-07	3.30E-06	0.00E+00	0.00E+00	1.58E-05	6.93E-05
										Zinc	1.4-4	2.84E-05	2.08E-04	9.12E-04		1.04E-05	4.56E-05	0.00E+00	0.00E+00	2.19E-04	9.57E-04

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Location	Unit ID	Manufacturer Model Number	Install Year	Rated Output[3] HP	Rated Output[3] MMBtu per Hr	On-line Rating Actual	On-line Rating Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	Emission Factor lb/MMBtu	Baseline Emission Rate lbs/hr	Baseline Emission Rate tons/yr	Remarks	% Increase for Heating Units 5% lbs/hr	% Increase for Heating Units 5% tons/yr	Increase for FEC[4] or Potential Growth lbs/hr	Increase for FEC[4] or Potential Growth tons/yr	Total Emissions lbs/hr	Total Emissions tons/yr
Building C	CBOIHWB Boiler (AMIS: HWB-2)	Sellers 15 Senior S-200-W	1982	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	NO_x	1.4-1	9.80E-02	8.20E-01	3.59E+00	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.	4.10E-02	1.80E-01	0.00E+00	0.00E+00	8.61E-01	3.77E+00
										CO	1.4-1	8.24E-02	6.89E-01	3.02E+00		3.45E-02	1.51E-01	0.00E+00	0.00E+00	7.24E-01	3.17E+00
										SO_2	1.4-2	5.88E-04	4.92E-03	2.16E-02		2.46E-04	1.08E-03	0.00E+00	0.00E+00	5.17E-03	2.26E-02
										VOC	1.4-2	5.39E-03	4.51E-02	1.98E-01		2.26E-03	9.88E-03	0.00E+00	0.00E+00	4.74E-02	2.08E-01
										$PM_{2.5}$[2]	1.4-2	7.45E-03	6.24E-02	2.73E-01		3.12E-03	1.37E-02	0.00E+00	0.00E+00	6.55E-02	2.87E-01
										HAPs	–	–	1.55E-02	6.78E-02		7.74E-04	3.39E-03	0.00E+00	0.00E+00	1.63E-02	7.12E-02
										Benzene	1.4-3	2.06E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	0.00E+00	0.00E+00	1.81E-05	7.92E-05
										Benzo(a)pyrene	1.4-3	1.18E-09	9.85E-09	4.31E-08		4.92E-10	2.16E-09	0.00E+00	0.00E+00	1.03E-08	4.53E-08
										Formaldehyde	1.4-3	7.35E-05	6.15E-04	2.70E-03		3.08E-05	1.35E-04	0.00E+00	0.00E+00	6.46E-04	2.83E-03
										Hexane	1.4-3	1.76E-03	1.48E-02	6.47E-02		7.38E-04	3.23E-03	0.00E+00	0.00E+00	1.55E-02	6.79E-02
										3-Methylcholanthrene	1.4-3	1.76E-09	1.48E-08	6.47E-08		7.38E-10	3.23E-09	0.00E+00	0.00E+00	1.55E-08	6.79E-08
										Naphthalene	1.4-3	5.98E-07	5.00E-06	2.19E-05		2.50E-07	1.10E-06	0.00E+00	0.00E+00	5.26E-06	2.30E-05
										Pentane	1.4-3	2.55E-03	2.13E-02	9.34E-02		1.07E-03	4.67E-03	0.00E+00	0.00E+00	2.24E-02	9.81E-02
										Toluene	1.4-3	3.33E-06	2.79E-05	1.22E-04		1.39E-06	6.11E-06	0.00E+00	0.00E+00	2.93E-05	1.28E-04
										Arsenic	1.4-4	1.96E-07	1.64E-06	7.19E-06		8.20E-08	3.59E-07	0.00E+00	0.00E+00	1.72E-06	7.55E-06
										Barium	1.4-4	4.31E-06	3.61E-05	1.58E-04		1.81E-06	7.91E-06	0.00E+00	0.00E+00	3.79E-05	1.66E-04
										Cadmium	1.4-4	1.08E-06	9.03E-06	3.95E-05		4.51E-07	1.98E-06	0.00E+00	0.00E+00	9.48E-06	4.15E-05
										Chromium	1.4-4	1.37E-06	1.15E-05	5.03E-05		5.74E-07	2.52E-06	0.00E+00	0.00E+00	1.21E-05	5.28E-05
										Cobalt	1.4-4	8.24E-08	6.89E-07	3.02E-06		3.45E-08	1.51E-07	0.00E+00	0.00E+00	7.24E-07	3.17E-06
										Copper	1.4-4	8.33E-07	6.97E-06	3.05E-05		3.49E-07	1.53E-06	0.00E+00	0.00E+00	7.32E-06	3.21E-05
										Manganese	1.4-4	3.73E-07	3.12E-06	1.37E-05		1.56E-07	6.83E-07	0.00E+00	0.00E+00	3.27E-06	1.43E-05
										Mercury	1.4-4	2.55E-07	2.13E-06	9.34E-06		1.07E-07	4.67E-07	0.00E+00	0.00E+00	2.24E-06	9.81E-06
										Molybdenum	1.4-4	1.08E-06	9.03E-06	3.95E-05		4.51E-07	1.98E-06	0.00E+00	0.00E+00	9.48E-06	4.15E-05
										Nickel	1.4-4	2.06E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	0.00E+00	0.00E+00	1.81E-05	7.92E-05
										Zinc	1.4-4	2.84E-05	2.38E-04	1.04E-03		1.19E-05	5.21E-05	0.00E+00	0.00E+00	2.50E-04	1.09E-03
Building D	DBOIHWB Boiler (AMIS: HWB-1)	Sellers 15 Senior S-200-W	1982	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	NO_x	1.4-1	9.80E-02	8.20E-01	3.59E+00	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.	4.10E-02	1.80E-01	0.00E+00	0.00E+00	8.61E-01	3.77E+00
										CO	1.4-1	8.24E-02	6.89E-01	3.02E+00		3.45E-02	1.51E-01	0.00E+00	0.00E+00	7.24E-01	3.17E+00
										SO_2	1.4-2	5.88E-04	4.92E-03	2.16E-02		2.46E-04	1.08E-03	0.00E+00	0.00E+00	5.17E-03	2.26E-02
										VOC	1.4-2	5.39E-03	4.51E-02	1.98E-01		2.26E-03	9.88E-03	0.00E+00	0.00E+00	4.74E-02	2.08E-01
										$PM_{2.5}$[2]	1.4-2	7.45E-03	6.24E-02	2.73E-01		3.12E-03	1.37E-02	0.00E+00	0.00E+00	6.55E-02	2.87E-01
										HAPs	–	–	1.55E-02	6.78E-02		7.74E-04	3.39E-03	0.00E+00	0.00E+00	1.63E-02	7.12E-02
										Benzene	1.4-3	2.06E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	0.00E+00	0.00E+00	1.81E-05	7.92E-05
										Benzo(a)pyrene	1.4-3	1.18E-09	9.85E-09	4.31E-08		4.92E-10	2.16E-09	0.00E+00	0.00E+00	1.03E-08	4.53E-08
										Formaldehyde	1.4-3	7.35E-05	6.15E-04	2.70E-03		3.08E-05	1.35E-04	0.00E+00	0.00E+00	6.46E-04	2.83E-03
										Hexane	1.4-3	1.76E-03	1.48E-02	6.47E-02		7.38E-04	3.23E-03	0.00E+00	0.00E+00	1.55E-02	6.79E-02
										3-Methylcholanthrene	1.4-3	1.76E-09	1.48E-08	6.47E-08		7.38E-10	3.23E-09	0.00E+00	0.00E+00	1.55E-08	6.79E-08
										Naphthalene	1.4-3	5.98E-07	5.00E-06	2.19E-05		2.50E-07	1.10E-06	0.00E+00	0.00E+00	5.26E-06	2.30E-05
										Pentane	1.4-3	2.55E-03	2.13E-02	9.34E-02		1.07E-03	4.67E-03	0.00E+00	0.00E+00	2.24E-02	9.81E-02
										Toluene	1.4-3	3.33E-06	2.79E-05	1.22E-04		1.39E-06	6.11E-06	0.00E+00	0.00E+00	2.93E-05	1.28E-04
										Arsenic	1.4-4	1.96E-07	1.64E-06	7.19E-06		8.20E-08	3.59E-07	0.00E+00	0.00E+00	1.72E-06	7.55E-06
										Barium	1.4-4	4.31E-06	3.61E-05	1.58E-04		1.81E-06	7.91E-06	0.00E+00	0.00E+00	3.79E-05	1.66E-04
										Cadmium	1.4-4	1.08E-06	9.03E-06	3.95E-05		4.51E-07	1.98E-06	0.00E+00	0.00E+00	9.48E-06	4.15E-05
										Chromium	1.4-4	1.37E-06	1.15E-05	5.03E-05		5.74E-07	2.52E-06	0.00E+00	0.00E+00	1.21E-05	5.28E-05
										Cobalt	1.4-4	8.24E-08	6.89E-07	3.02E-06		3.45E-08	1.51E-07	0.00E+00	0.00E+00	7.24E-07	3.17E-06
										Copper	1.4-4	8.33E-07	6.97E-06	3.05E-05		3.49E-07	1.53E-06	0.00E+00	0.00E+00	7.32E-06	3.21E-05
										Manganese	1.4-4	3.73E-07	3.12E-06	1.37E-05		1.56E-07	6.83E-07	0.00E+00	0.00E+00	3.27E-06	1.43E-05
										Mercury	1.4-4	2.55E-07	2.13E-06	9.34E-06		1.07E-07	4.67E-07	0.00E+00	0.00E+00	2.24E-06	9.81E-06
										Molybdenum	1.4-4	1.08E-06	9.03E-06	3.95E-05		4.51E-07	1.98E-06	0.00E+00	0.00E+00	9.48E-06	4.15E-05
										Nickel	1.4-4	2.06E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	0.00E+00	0.00E+00	1.81E-05	7.92E-05
										Zinc	1.4-4	2.84E-05	2.38E-04	1.04E-03		1.19E-05	5.21E-05	0.00E+00	0.00E+00	2.50E-04	1.09E-03
Building D	DBOIST1 Boiler (AMIS: ST-2)	Sellers 15 Commodore 125	1983	125	4.18	8,760	8,760	Natural Gas @ 1020 BTU/CF	5,128	NO_x	1.4-1	9.80E-02	5.13E-01	2.25E+00	Steam boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.	2.56E-02	1.12E-01	0.00E+00	0.00E+00	5.38E-01	2.36E+00
										CO	1.4-1	8.24E-02	4.31E-01	1.89E+00		2.15E-02	9.43E-02	0.00E+00	0.00E+00	4.52E-01	1.98E+00
										SO_2	1.4-2	5.88E-04	3.08E-03	1.35E-02		1.54E-04	6.74E-04	0.00E+00	0.00E+00	3.23E-03	1.41E-02
										VOC	1.4-2	5.39E-03	2.82E-02	1.24E-01		1.41E-03	6.18E-03	0.00E+00	0.00E+00	2.96E-02	1.30E-01
										$PM_{2.5}$[2]	1.4-2	7.45E-03	3.90E-02	1.71E-01		1.95E-03	8.53E-03	0.00E+00	0.00E+00	4.09E-02	1.79E-01
										HAPs	–	–	9.67E-03	4.24E-02		4.84E-04	2.12E-03	0.00E+00	0.00E+00	1.02E-02	4.45E-02
										Benzene	1.4-3	2.06E-06	1.08E-05	4.72E-05		5.38E-07	2.36E-06	0.00E+00	0.00E+00	1.13E-05	4.95E-05
										Benzo(a)pyrene	1.4-3	1.18E-09	6.15E-09	2.70E-08		3.08E-10	1.35E-09	0.00E+00	0.00E+00	6.46E-09	2.83E-08
										Formaldehyde	1.4-3	7.35E-05	3.85E-04	1.68E-03		1.92E-05	8.42E-05	0.00E+00	0.00E+00	4.04E-04	1.77E-03
										Hexane	1.4-3	1.76E-03	9.23E-03	4.04E-02		4.62E-04	2.02E-03	0.00E+00	0.00E+00	9.69E-03	4.24E-02
										3-Methylcholanthrene	1.4-3	1.76E-09	9.23E-09	4.04E-08		4.62E-10	2.02E-09	0.00E+00	0.00E+00	9.69E-09	4.24E-08
										Naphthalene	1.4-3	5.98E-07	3.13E-06	1.37E-05		1.56E-07	6.85E-07	0.00E+00	0.00E+00	3.28E-06	1.44E-05
										Pentane	1.4-3	2.55E-03	1.33E-02	5.84E-02		6.67E-04	2.92E-03	0.00E+00	0.00E+00	1.40E-02	6.13E-02
										Toluene	1.4-3	3.33E-06	1.74E-05	7.64E-05		8.72E-07	3.82E-06	0.00E+00	0.00E+00	1.83E-05	8.02E-05
										Arsenic	1.4-4	1.96E-07	1.03E-06	4.49E-06		5.13E-08	2.25E-07	0.00E+00	0.00E+00	1.08E-06	4.72E-06
										Barium	1.4-4	4.31E-06	2.26E-05	9.88E-05		1.13E-06	4.94E-06	0.00E+00	0.00E+00	2.37E-05	1.04E-04
										Cadmium	1.4-4	1.08E-06	5.64E-06	2.47E-05		2.82E-07	1.24E-06	0.00E+00	0.00E+00	5.92E-06	2.59E-05
										Chromium	1.4-4	1.37E-06	7.18E-06	3.14E-05		3.59E-07	1.57E-06	0.00E+00	0.00E+00	7.54E-06	3.30E-05
										Cobalt	1.4-4	8.24E-08	4.31E-07	1.89E-06		2.15E-08	9.43E-08	0.00E+00	0.00E+00	4.52E-07	1.98E-06
										Copper	1.4-4	8.33E-07	4.36E-06	1.91E-05		2.18E-07	9.55E-07	0.00E+00	0.00E+00	4.58E-06	2.00E-05
										Manganese	1.4-4	3.73E-07	1.95E-06	8.53E-06		9.74E-08	4.27E-07	0.00E+00	0.00E+00	2.05E-06	8.96E-06
										Mercury	1.4-4	2.55E-07	1.33E-06	5.84E-06		6.67E-08	2.92E-07	0.00E+00	0.00E+00	1.40E-06	6.13E-06
										Molybdenum	1.4-4	1.08E-06	5.64E-06	2.47E-05		2.82E-07	1.24E-06	0.00E+00	0.00E+00	5.92E-06	2.59E-05
										Nickel	1.4-4	2.06E-06	1.08E-05	4.72E-05		5.38E-07	2.36E-06	0.00E+00	0.00E+00	1.13E-05	4.95E-05
										Zinc	1.4-4	2.84E-05	1.49E-04	6.51E-04		7.44E-06	3.26E-05	0.00E+00	0.00E+00	1.56E-04	6.84E-04

ON Semiconductors, Pocatello, ID

Fuel Burning Equipment - Boilers

Location	Unit ID	Manufacturer Model Number	Install Year	Rated Output[3] HP	Rated Output[3] MMBtu per Hr	On-line Rating Actual	On-line Rating Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	lb/MMBtu	Baseline Emission Rate lbs/hr	Baseline Emission Rate tons/yr	Remarks	% Increase for Heating Units 5% lbs/hr	% Increase for Heating Units 5% tons/yr	Increase for FEC[4] or Potential Growth lbs/hr	Increase for FEC[4] or Potential Growth tons/yr	Total Emissions lbs/hr	Total Emissions tons/yr
Building G	GBOIHWE Boiler	Lochinvar CWN1436PM	1997	35	1.16	4,380	8,760	Natural Gas @ 1020 BTU/CF	1,407	NO_x	1.4-1.	9.80E-02	1.41E-01	6.16E-01	Hot water boiler, winter service only. 81% efficiency per manufacture. AP-42 class: small boiler, uncontrolled.	7.03E-03	3.08E-02	0.00E+00	0.00E+00	1.48E-01	6.47E-01
										CO	1.4-1.	8.24E-02	1.18E-01	5.18E-01		5.91E-03	2.59E-02	0.00E+00	0.00E+00	1.24E-01	5.43E-01
										SO_2	1.4-2.	5.88E-04	8.44E-04	3.70E-03		4.22E-05	1.85E-04	0.00E+00	0.00E+00	8.86E-04	3.88E-03
										VOC	1.4-2.	5.39E-03	7.74E-03	3.39E-02		3.87E-04	1.69E-03	0.00E+00	0.00E+00	8.12E-03	3.56E-02
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	1.07E-02	4.68E-02		5.35E-04	2.34E-03	0.00E+00	0.00E+00	1.12E-02	4.92E-02
										HAPs	–	–	2.65E-03	1.16E-02		1.33E-04	5.81E-04	0.00E+00	0.00E+00	2.79E-03	1.22E-02
										Benzene	1.4-3	2.06E-06	2.95E-06	1.29E-05		1.48E-07	6.47E-07	0.00E+00	0.00E+00	3.10E-06	1.36E-05
										Benzo(a)pyrene	1.4-3	1.18E-09	1.69E-09	7.39E-09		8.44E-11	3.70E-10	0.00E+00	0.00E+00	1.77E-09	7.76E-09
										Formaldehyde	1.4-3	7.35E-05	1.06E-04	4.62E-04		5.28E-06	2.31E-05	0.00E+00	0.00E+00	1.11E-04	4.85E-04
										Hexane	1.4-3	1.76E-03	2.53E-03	1.11E-02		1.27E-04	5.55E-04	0.00E+00	0.00E+00	2.66E-03	1.16E-02
										3-Methylcholanthrene	1.4-3	1.76E-09	2.53E-09	1.11E-08		1.27E-10	5.55E-10	0.00E+00	0.00E+00	2.66E-09	1.16E-08
										Naphthalene	1.4-3	5.98E-07	8.58E-07	3.76E-06		4.29E-08	1.88E-07	0.00E+00	0.00E+00	9.01E-07	3.95E-06
										Pentane	1.4-3	2.55E-03	3.66E-03	1.60E-02		1.83E-04	8.01E-04	0.00E+00	0.00E+00	3.84E-03	1.68E-02
										Toluene	1.4-3	3.33E-06	4.78E-06	2.09E-05		2.39E-07	1.05E-06	0.00E+00	0.00E+00	5.02E-06	2.20E-05
										Arsenic	1.4-4	1.96E-07	2.81E-07	1.23E-06		1.41E-08	6.16E-08	0.00E+00	0.00E+00	2.95E-07	1.29E-06
										Barium	1.4-4	4.31E-06	6.19E-06	2.71E-05		3.09E-07	1.36E-06	0.00E+00	0.00E+00	6.50E-06	2.85E-05
										Cadmium	1.4-4	1.08E-06	1.55E-06	6.78E-06		7.74E-08	3.39E-07	0.00E+00	0.00E+00	1.62E-06	7.12E-06
										Chromium	1.4-4	1.37E-06	1.97E-06	8.63E-06		9.85E-08	4.31E-07	0.00E+00	0.00E+00	2.07E-06	9.06E-06
										Cobalt	1.4-4	8.24E-08	1.18E-07	5.18E-07		5.91E-09	2.59E-08	0.00E+00	0.00E+00	1.24E-07	5.43E-07
										Copper	1.4-4	8.33E-07	1.20E-06	5.24E-06		5.98E-08	2.62E-07	0.00E+00	0.00E+00	1.26E-06	5.50E-06
										Manganese	1.4-4	3.73E-07	5.35E-07	2.34E-06		2.67E-08	1.17E-07	0.00E+00	0.00E+00	5.61E-07	2.46E-06
										Mercury	1.4-4	2.55E-07	3.66E-07	1.60E-06		1.83E-08	8.01E-08	0.00E+00	0.00E+00	3.84E-07	1.68E-06
										Molybdenum	1.4-4	1.08E-06	1.55E-06	6.78E-06		7.74E-08	3.39E-07	0.00E+00	0.00E+00	1.62E-06	7.12E-06
										Nickel	1.4-4	2.06E-06	2.95E-06	1.29E-05		1.48E-07	6.47E-07	0.00E+00	0.00E+00	3.10E-06	1.36E-05
										Zinc	1.4-4	2.84E-05	4.08E-05	1.79E-04		2.04E-06	8.93E-06	0.00E+00	0.00E+00	4.28E-05	1.88E-04
Building G	GBOISB1 Boiler (ONS: SB-1)	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	NO_x	1.4-1.	4.90E-02	6.15E-01	2.70E+00	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.	3.08E-02	1.35E-01	4.10E-01	1.80E+00	1.06E+00	4.63E+00
										CO	1.4-1.	8.24E-02	1.03E+00	4.53E+00		5.17E-02	2.26E-01	6.89E-01	3.02E+00	1.77E+00	7.77E+00
										SO_2	1.4-2.	5.88E-04	7.38E-03	3.23E-02		3.69E-04	1.62E-03	4.92E-03	2.16E-02	1.27E-02	5.55E-02
										VOC	1.4-2.	5.39E-03	6.77E-02	2.96E-01		3.38E-03	1.48E-02	4.51E-02	1.98E-01	1.16E-01	5.09E-01
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	9.35E-02	4.10E-01		4.68E-03	2.05E-02	6.24E-02	2.73E-01	1.61E-01	7.03E-01
										HAPs	–	–	2.32E-02	1.02E-01		1.16E-03	5.08E-03	1.55E-02	6.78E-02	3.99E-02	1.75E-01
										Benzene	1.4-3	2.06E-06	2.58E-05	1.13E-04		1.29E-06	5.66E-06	1.72E-05	7.55E-05	4.44E-05	1.94E-04
										Benzo(a)pyrene	1.4-3	1.18E-09	1.48E-08	6.47E-08		7.38E-10	3.23E-09	9.85E-09	4.31E-08	2.54E-08	1.11E-07
										Formaldehyde	1.4-3	7.35E-05	9.23E-04	4.04E-03		4.62E-05	2.02E-04	6.15E-04	2.70E-03	1.58E-03	6.94E-03
										Hexane	1.4-3	1.76E-03	2.22E-02	9.70E-02		1.11E-03	4.85E-03	1.48E-02	6.47E-02	3.80E-02	1.67E-01
										3-Methylcholanthrene	1.4-3	1.76E-09	2.22E-08	9.70E-08		1.11E-09	4.85E-09	1.48E-08	6.47E-08	3.80E-08	1.67E-07
										Napthalene	1.4-3	5.98E-07	7.51E-06	3.29E-05		3.75E-07	1.64E-06	5.00E-06	2.19E-05	1.29E-05	5.64E-05
										Pentane	1.4-3	2.55E-03	3.20E-02	1.40E-01		1.60E-03	7.01E-03	2.13E-02	9.34E-02	5.49E-02	2.41E-01
										Toluene	1.4-3	3.33E-06	4.18E-05	1.83E-04		2.09E-06	9.16E-06	2.79E-05	1.22E-04	7.18E-05	3.15E-04
										Arsenic	1.4-4	1.96E-07	2.46E-06	1.08E-05		1.23E-07	5.39E-07	1.64E-06	7.19E-06	4.23E-06	1.85E-05
										Barium	1.4-4	4.31E-06	5.42E-05	2.37E-04		2.71E-06	1.19E-05	3.61E-05	1.58E-04	9.30E-05	4.07E-04
										Cadmium	1.4-4	1.08E-06	1.35E-05	5.93E-05		6.77E-07	2.96E-06	9.03E-06	3.95E-05	2.32E-05	1.02E-04
										Chromium	1.4-4	1.37E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	1.15E-05	5.03E-05	2.96E-05	1.30E-04
										Cobalt	1.4-4	8.24E-08	1.03E-06	4.53E-06		5.17E-08	2.26E-07	6.89E-07	3.02E-06	1.77E-06	7.77E-06
										Copper	1.4-4	8.33E-07	1.05E-05	4.58E-05		5.23E-07	2.29E-06	6.97E-06	3.05E-05	1.80E-05	7.87E-05
										Manganese	1.4-4	3.73E-07	4.68E-06	2.05E-05		2.34E-07	1.02E-06	3.12E-06	1.37E-05	8.03E-06	3.52E-05
										Mercury	1.4-4	2.55E-07	3.20E-06	1.40E-05		1.60E-07	7.01E-07	2.13E-06	9.34E-06	5.49E-06	2.41E-05
										Molybdenum	1.4-4	1.08E-06	1.35E-05	5.93E-05		6.77E-07	2.96E-06	9.03E-06	3.95E-05	2.32E-05	1.02E-04
										Nickel	1.4-4	2.06E-06	2.58E-05	1.13E-04		1.29E-06	5.66E-06	1.72E-05	7.55E-05	4.44E-05	1.94E-04
										Zinc	1.4-4	2.84E-05	3.57E-04	1.56E-03		1.78E-05	7.82E-05	2.38E-04	1.04E-03	6.13E-04	2.68E-03
Building G	GBOISB2 Boiler (ONS: SB-2)	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	NO_x	1.4-1.	4.90E-02	6.15E-01	2.70E+00	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.	3.08E-02	1.35E-01	4.10E-01	1.80E+00	1.06E+00	4.63E+00
										CO	1.4-1.	8.24E-02	1.03E+00	4.53E+00		5.17E-02	2.26E-01	6.89E-01	3.02E+00	1.77E+00	7.77E+00
										SO_2	1.4-2.	5.88E-04	7.38E-03	3.23E-02		3.69E-04	1.62E-03	4.92E-03	2.16E-02	1.27E-02	5.55E-02
										VOC	1.4-2.	5.39E-03	6.77E-02	2.96E-01		3.38E-03	1.48E-02	4.51E-02	1.98E-01	1.16E-01	5.09E-01
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	9.35E-02	4.10E-01		4.68E-03	2.05E-02	6.24E-02	2.73E-01	1.61E-01	7.03E-01
										HAPs	–	–	2.32E-02	1.02E-01		1.16E-03	5.08E-03	1.55E-02	6.78E-02	3.99E-02	1.75E-01
										Benzene	1.4-3	2.06E-06	2.58E-05	1.13E-04		1.29E-06	5.66E-06	1.72E-05	7.55E-05	4.44E-05	1.94E-04
										Benzo(a)pyrene	1.4-3	1.18E-09	1.48E-08	6.47E-08		7.38E-10	3.23E-09	9.85E-09	4.31E-08	2.54E-08	1.11E-07
										Formaldehyde	1.4-3	7.35E-05	9.23E-04	4.04E-03		4.62E-05	2.02E-04	6.15E-04	2.70E-03	1.58E-03	6.94E-03
										Hexane	1.4-3	1.76E-03	2.22E-02	9.70E-02		1.11E-03	4.85E-03	1.48E-02	6.47E-02	3.80E-02	1.67E-01
										3-Methylcholanthrene	1.4-3	1.76E-09	2.22E-08	9.70E-08		1.11E-09	4.85E-09	1.48E-08	6.47E-08	3.80E-08	1.67E-07
										Napthalene	1.4-3	5.98E-07	7.51E-06	3.29E-05		3.75E-07	1.64E-06	5.00E-06	2.19E-05	1.29E-05	5.64E-05
										Pentane	1.4-3	2.55E-03	3.20E-02	1.40E-01		1.60E-03	7.01E-03	2.13E-02	9.34E-02	5.49E-02	2.41E-01
										Toluene	1.4-3	3.33E-06	4.18E-05	1.83E-04		2.09E-06	9.16E-06	2.79E-05	1.22E-04	7.18E-05	3.15E-04
										Arsenic	1.4-4	1.96E-07	2.46E-06	1.08E-05		1.23E-07	5.39E-07	1.64E-06	7.19E-06	4.23E-06	1.85E-05
										Barium	1.4-4	4.31E-06	5.42E-05	2.37E-04		2.71E-06	1.19E-05	3.61E-05	1.58E-04	9.30E-05	4.07E-04
										Cadmium	1.4-4	1.08E-06	1.35E-05	5.93E-05		6.77E-07	2.96E-06	9.03E-06	3.95E-05	2.32E-05	1.02E-04
										Chromium	1.4-4	1.37E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	1.15E-05	5.03E-05	2.96E-05	1.30E-04
										Cobalt	1.4-4	8.24E-08	1.03E-06	4.53E-06		5.17E-08	2.26E-07	6.89E-07	3.02E-06	1.77E-06	7.77E-06
										Copper	1.4-4	8.33E-07	1.05E-05	4.58E-05		5.23E-07	2.29E-06	6.97E-06	3.05E-05	1.80E-05	7.87E-05
										Manganese	1.4-4	3.73E-07	4.68E-06	2.05E-05		2.34E-07	1.02E-06	3.12E-06	1.37E-05	8.03E-06	3.52E-05
										Mercury	1.4-4	2.55E-07	3.20E-06	1.40E-05		1.60E-07	7.01E-07	2.13E-06	9.34E-06	5.49E-06	2.41E-05
										Molybdenum	1.4-4	1.08E-06	1.35E-05	5.93E-05		6.77E-07	2.96E-06	9.03E-06	3.95E-05	2.32E-05	1.02E-04
										Nickel	1.4-4	2.06E-06	2.58E-05	1.13E-04		1.29E-06	5.66E-06	1.72E-05	7.55E-05	4.44E-05	1.94E-04
										Zinc	1.4-4	2.84E-05	3.57E-04	1.56E-03		1.78E-05	7.82E-05	2.38E-04	1.04E-03	6.13E-04	2.68E-03

ON Semiconductors, Pocatello, ID

Fuel Burning Equipment - Boilers

Location	Unit ID	Manufacturer Model Number	Install Year	Rated Output[3] HP	Rated Output[3] MMBtu per Hr	On-line Rating Actual	On-line Rating Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	lb/MMBtu	Baseline Emission Rate lbs/hr	Baseline Emission Rate tons/yr	Remarks	% Increase for Heating Units 5% lbs/hr	% Increase for Heating Units 5% tons/yr	Increase for FEC[4] or Potential Growth lbs/hr	Increase for FEC[4] or Potential Growth tons/yr	Total Emissions lbs/hr	Total Emissions tons/yr
Building G	GBOISB3 Boiler (ONS: SB-3)	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	NO_x	1.4-1.	4.90E-02	6.15E-01	2.70E+00	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.	3.08E-02	1.35E-01	4.10E-01	1.80E+00	1.06E+00	4.63E+00
										CO	1.4-1.	8.24E-02	1.03E+00	4.53E+00		5.17E-02	2.26E-01	6.89E-01	3.02E+00	1.77E+00	7.77E+00
										SO_2	1.4-2.	5.88E-04	7.38E-03	3.23E-02		3.69E-04	1.62E-03	4.92E-03	2.16E-02	1.27E-02	5.55E-02
										VOC	1.4-2.	5.39E-03	6.77E-02	2.96E-01		3.38E-03	1.48E-02	4.51E-02	1.98E-01	1.16E-01	5.09E-01
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	9.35E-02	4.10E-01		4.68E-03	2.05E-02	6.24E-02	2.73E-01	1.61E-01	7.03E-01
										HAPs	--	--	2.32E-02	1.02E-01		1.16E-03	5.08E-03	1.55E-02	6.78E-02	3.99E-02	1.75E-01
										Benzene	1.4-3	2.06E-06	2.58E-05	1.13E-04		1.29E-06	5.66E-06	1.72E-05	7.55E-05	4.44E-05	1.94E-04
										Benzo(a)pyrene	1.4-3	1.18E-09	1.48E-08	6.47E-08		7.38E-10	3.23E-09	9.85E-09	4.31E-08	2.54E-08	1.11E-07
										Formaldehyde	1.4-3	7.35E-05	9.23E-04	4.04E-03		4.62E-05	2.02E-04	6.15E-04	2.70E-03	1.58E-03	6.94E-03
										Hexane	1.4-3	1.76E-03	2.22E-02	9.70E-02		1.11E-03	4.85E-03	1.48E-02	6.47E-02	3.80E-02	1.67E-01
										3-Methylcholanthrene	1.4-3	1.76E-09	2.22E-08	9.70E-08		1.11E-09	4.85E-09	1.48E-08	6.47E-08	3.80E-08	1.67E-07
										Napthalene	1.4-3	5.98E-07	7.51E-06	3.29E-05		3.75E-07	1.64E-06	5.00E-06	2.19E-05	1.29E-05	5.64E-05
										Pentane	1.4-3	2.55E-03	3.20E-02	1.40E-01		1.60E-03	7.01E-03	2.13E-02	9.34E-02	5.49E-02	2.41E-01
										Toluene	1.4-3	3.33E-06	4.18E-05	1.83E-04		2.09E-06	9.16E-06	2.79E-05	1.22E-04	7.18E-05	3.15E-04
										Arsenic	1.4-4	1.96E-07	2.46E-06	1.08E-05		1.23E-07	5.39E-07	1.64E-06	7.19E-06	4.23E-06	1.85E-05
										Barium	1.4-4	4.31E-06	5.42E-05	2.37E-04		2.71E-06	1.19E-05	3.61E-05	1.58E-04	9.30E-05	4.07E-04
										Cadmium	1.4-4	1.08E-06	1.35E-05	5.93E-05		6.77E-07	2.96E-06	9.03E-06	3.95E-05	2.32E-05	1.02E-04
										Chromium	1.4-4	1.37E-06	1.72E-05	7.55E-05		8.61E-07	3.77E-06	1.15E-05	5.03E-05	2.96E-05	1.30E-04
										Cobalt	1.4-4	8.24E-08	1.03E-06	4.53E-06		5.17E-08	2.26E-07	6.89E-07	3.02E-06	1.77E-06	7.77E-06
										Copper	1.4-4	8.33E-07	1.05E-05	4.58E-05		5.23E-07	2.29E-06	6.97E-06	3.05E-05	1.80E-05	7.87E-05
										Manganese	1.4-4	3.73E-07	4.68E-06	2.05E-05		2.34E-07	1.02E-06	3.12E-06	1.37E-05	8.03E-06	3.52E-05
										Mercury	1.4-4	2.55E-07	3.20E-06	1.40E-05		1.60E-07	7.01E-07	2.13E-06	9.34E-06	5.49E-06	2.41E-05
										Molybdenum	1.4-4	1.08E-06	1.35E-05	5.93E-05		6.77E-07	2.96E-06	9.03E-06	3.95E-05	2.32E-05	1.02E-04
										Nickel	1.4-4	2.06E-06	2.58E-05	1.13E-04		1.29E-06	5.66E-06	1.72E-05	7.55E-05	4.44E-05	1.94E-04
										Zinc	1.4-4	2.84E-05	3.57E-04	1.56E-03		1.78E-05	7.82E-05	2.38E-04	1.04E-03	6.13E-04	2.68E-03
Building G	GBOISB4 Boiler	TBD	TBD	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	NO_x	1.4-1.	4.90E-02	6.15E-01	2.70E+00	Future potential boiler. Assumed will be sized equivalent to GBOISB1-3						
										CO	1.4-1.	8.24E-02	1.03E+00	4.53E+00							
										SO_2	1.4-2.	5.88E-04	7.38E-03	3.23E-02							
										VOC	1.4-2.	5.39E-03	6.77E-02	2.96E-01							
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	9.35E-02	4.10E-01							
										Benzene	1.4-3	2.06E-06	2.58E-05	1.13E-04							
										Benzo(a)pyrene	1.4-3	1.18E-09	1.48E-08	6.47E-08							
										Formaldehyde	1.4-3	7.35E-05	9.23E-04	4.04E-03							
										Hexane	1.4-3	1.76E-03	2.22E-02	9.70E-02							
										3-Methylcholanthrene	1.4-3	1.76E-09	2.22E-08	9.70E-08							
										Napthalene	1.4-3	5.98E-07	7.51E-06	3.29E-05							
										Pentane	1.4-3	2.55E-03	3.20E-02	1.40E-01							
										Toluene	1.4-3	3.33E-06	4.18E-05	1.83E-04							
										Arsenic	1.4-4	1.96E-07	2.46E-06	1.08E-05							
										Barium	1.4-4	4.31E-06	5.42E-05	2.37E-04							
										Cadmium	1.4-4	1.08E-06	1.35E-05	5.93E-05							
										Chromium	1.4-4	1.37E-06	1.72E-05	7.55E-05							
										Cobalt	1.4-4	8.24E-08	1.03E-06	4.53E-06							
										Copper	1.4-4	8.33E-07	1.05E-05	4.58E-05							
										Manganese	1.4-4	3.73E-07	4.68E-06	2.05E-05							
										Mercury	1.4-4	2.55E-07	3.20E-06	1.40E-05							
										Molybdenum	1.4-4	1.08E-06	1.35E-05	5.93E-05							
										Nickel	1.4-4	2.06E-06	2.58E-05	1.13E-04							
										Zinc	1.4-4	2.84E-05	3.57E-04	1.56E-03							
Building G	GBOISB5 Boiler	TBD	TBD	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	NO_x	1.4-1.	4.90E-02	6.15E-01	2.70E+00	Future potential boiler. Assumed will be sized equivalent to GBOISB1-3						
										CO	1.4-1.	8.24E-02	1.03E+00	4.53E+00							
										SO_2	1.4-2.	5.88E-04	7.38E-03	3.23E-02							
										VOC	1.4-2.	5.39E-03	6.77E-02	2.96E-01							
										$PM_{2.5}$[2]	1.4-2.	7.45E-03	9.35E-02	4.10E-01							
										Benzene	1.4-3	2.06E-06	2.58E-05	1.13E-04							
										Benzo(a)pyrene	1.4-3	1.18E-09	1.48E-08	6.47E-08							
										Formaldehyde	1.4-3	7.35E-05	9.23E-04	4.04E-03							
										Hexane	1.4-3	1.76E-03	2.22E-02	9.70E-02							
										3-Methylcholanthrene	1.4-3	1.76E-09	2.22E-08	9.70E-08							
										Napthalene	1.4-3	5.98E-07	7.51E-06	3.29E-05							
										Pentane	1.4-3	2.55E-03	3.20E-02	1.40E-01							
										Toluene	1.4-3	3.33E-06	4.18E-05	1.83E-04							
										Arsenic	1.4-4	1.96E-07	2.46E-06	1.08E-05							
										Barium	1.4-4	4.31E-06	5.42E-05	2.37E-04							
										Cadmium	1.4-4	1.08E-06	1.35E-05	5.93E-05							
										Chromium	1.4-4	1.37E-06	1.72E-05	7.55E-05							
										Cobalt	1.4-4	8.24E-08	1.03E-06	4.53E-06							
										Copper	1.4-4	8.33E-07	1.05E-05	4.58E-05							
										Manganese	1.4-4	3.73E-07	4.68E-06	2.05E-05							
										Mercury	1.4-4	2.55E-07	3.20E-06	1.40E-05							
										Molybdenum	1.4-4	1.08E-06	1.35E-05	5.93E-05							
										Nickel	1.4-4	2.06E-06	2.58E-05	1.13E-04							
										Zinc	1.4-4	2.84E-05	3.57E-04	1.56E-03							

1. AP 42, Fifth Edition, Volume I Chapter 1: External Combustion Sources, Section 1.4, July 1998.
2. All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_t emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.
3. Boiler HP is equivalent to 33,475 BTU/hr.
4. FEC proposed growth percentage is based on the percent increase in emissions above the baseline (for GBOISB1, 2, &3) that two future Boilers would have. The percentage was calculated by dividing the sum of the future boiler individual pollutant emission by the sum of the existing boiler (for GBOISB1, 2, &3) individual pollutant emission, i.e. [2.07 lb/hr CO]/[3.1 lb/hr CO] = .6667 and [9.06 ton/yr CO]/[13.6 ton/yr] = 0.6667.

ON Semiconductors, Pocatello, ID

Summary Boiler Emissions

Annual NG Use	Existing Boilers															Potential New Boilers - FEC Increase and Proposed Growth Calc					
SCF/Yr	Compound	CAS No.	lbs/hr	tons/year				lbs/hr	tons/year	lbs/hr	tons/year	lbs/hr	tons/year	lbs/hr	tons/year	lbs/hr	tons/year	lb/hr	tpy	% Increase	
			Base Emissions		HAP	TAP	VOC	Heating Unit Increase		Baseline w/Heating		FEC Increase or Projected Growth		Total Emissions		Future Boilers		GBOISB1, 2, & 3 Boilers			
666,478	NO_X		5.76	25.24	--	--	--	0.29	1.26	6.05	26.50	1.23	5.39	7.28	31.89	1.23	5.39	1.85E+00	8.09E+00	66.67%	66.67%
	CO		6.39	27.99	--	--	--	0.32	1.40	6.71	29.39	2.07	9.06	8.78	38.45	2.07	9.06	3.10E+00	1.36E+01	66.67%	66.67%
	SO_2		0.05	0.20	--	--	--	0.00	0.01	0.05	0.21	0.01	0.06	0.06	0.27	0.01	0.06	2.22E-02	9.70E-02	66.67%	66.67%
	VOC		0.42	1.83	--	--	--	0.02	0.09	0.44	1.92	0.14	0.59	0.57	2.52	0.14	0.59	2.03E-01	8.89E-01	66.67%	66.67%
	$PM_{2.5}$		0.58	2.53	--	--	--	0.03	0.13	0.61	2.66	0.19	0.82	0.79	3.48	0.19	0.82	2.81E-01	1.23E+00	66.67%	66.67%
	HAP		0.14	0.63	--	--	--	0.01	0.03	0.15	0.66	0.05	0.20	0.20	0.86	0.05	0.20	6.97E-02	3.05E-01	66.67%	66.67%
	Benzene	71-43-2	1.60E-04	7.00E-04	yes	yes	yes	7.99E-06	3.50E-05	1.68E-04	7.35E-04	5.17E-05	2.26E-04	2.19E-04	9.61E-04	5.17E-05	2.26E-04	7.75E-05	3.40E-04	66.67%	66.67%
	Benzo(a)pyrene	50-32-8	9.13E-08	4.00E-07	yes	yes	yes	4.56E-09	2.00E-08	9.59E-08	4.20E-07	2.95E-08	1.29E-07	1.25E-07	5.49E-07	2.95E-08	1.29E-07	4.43E-08	1.94E-07	66.67%	66.67%
	Formaldehyde	50-00-0	5.71E-03	2.50E-02	yes	yes	yes	2.85E-04	1.25E-03	5.99E-03	2.62E-02	1.85E-03	8.09E-03	7.84E-03	3.43E-02	1.85E-03	8.09E-03	2.77E-03	1.21E-02	66.67%	66.67%
	Hexane	110-54-3	1.37E-01	6.00E-01	yes	yes	yes	6.85E-03	3.00E-02	1.44E-01	6.30E-01	4.43E-02	1.94E-01	1.88E-01	8.24E-01	4.43E-02	1.94E-01	6.65E-02	2.91E-01	66.67%	66.67%
	3-Methylcholanthrene	56-49-5	1.37E-07	6.00E-07	no	yes	yes	6.85E-09	3.00E-08	1.44E-07	6.30E-07	4.43E-08	1.94E-07	1.88E-07	8.24E-07	4.43E-08	1.94E-07	6.65E-08	2.91E-07	66.67%	66.67%
	Napthalene	91-20-3	4.64E-05	2.03E-04	yes	yes	yes	2.32E-06	1.02E-05	4.87E-05	2.13E-04	1.50E-05	6.58E-05	6.37E-05	2.79E-04	1.50E-05	6.58E-05	2.25E-05	9.86E-05	66.67%	66.67%
	Pentane	109-66-0	1.98E-01	8.66E-01	no	yes	yes	9.89E-03	4.33E-02	2.08E-01	9.10E-01	6.40E-02	2.80E-01	2.72E-01	1.19E+00	6.40E-02	2.80E-01	9.60E-02	4.20E-01	66.67%	66.67%
	Toluene	108-88-3	2.59E-04	1.13E-03	yes	yes	yes	1.29E-05	5.67E-05	2.72E-04	1.19E-03	8.37E-05	3.67E-04	3.55E-04	1.56E-03	8.37E-05	3.67E-04	1.26E-04	5.50E-04	66.67%	66.67%
	Arsenic	7440-38-2	1.52E-05	6.66E-05	yes	yes	no	7.61E-07	3.33E-06	1.60E-05	7.00E-05	4.92E-06	2.16E-05	2.09E-05	9.15E-05	4.92E-06	2.16E-05	7.38E-06	3.23E-05	66.67%	66.67%
	Barium	7440-39-3	3.35E-04	1.47E-03	no	yes	no	1.67E-05	7.33E-05	3.51E-04	1.54E-03	1.08E-04	4.74E-04	4.60E-04	2.01E-03	1.08E-04	4.74E-04	1.62E-04	7.12E-04	66.67%	66.67%
	Cadmium	7440-43-9	8.37E-05	3.67E-04	yes	yes	no	4.18E-06	1.83E-05	8.79E-05	3.85E-04	2.71E-05	1.19E-04	1.15E-04	5.03E-04	2.71E-05	1.19E-04	4.06E-05	1.78E-04	66.67%	66.67%
	Chromium	7440-47-3	1.07E-04	4.67E-04	yes	yes	no	5.33E-06	2.33E-05	1.12E-04	4.90E-04	3.45E-05	1.51E-04	1.46E-04	6.41E-04	3.45E-05	1.51E-04	5.17E-05	2.26E-04	66.67%	66.67%
	Cobalt	7440-48-4	6.39E-06	2.80E-05	yes	yes	no	3.20E-07	1.40E-06	6.71E-06	2.94E-05	2.07E-06	9.06E-06	8.78E-06	3.84E-05	2.07E-06	9.06E-06	3.10E-06	1.36E-05	66.67%	66.67%
	Copper	7440-50-8	6.47E-05	2.83E-04	no	yes	no	3.23E-06	1.42E-05	6.79E-05	2.97E-04	2.09E-05	9.16E-05	8.88E-05	3.89E-04	2.09E-05	9.16E-05	3.14E-05	1.37E-04	66.67%	66.67%
	Manganese	7439-96-5	2.89E-05	1.27E-04	yes	yes	no	1.45E-06	6.33E-06	3.04E-05	1.33E-04	9.35E-06	4.10E-05	3.97E-05	1.74E-04	9.35E-06	4.10E-05	1.40E-05	6.15E-05	66.67%	66.67%
	Mercury	7439-97-6	1.98E-05	8.66E-05	yes	yes	no	9.89E-07	4.33E-06	2.08E-05	9.10E-05	6.40E-06	2.80E-05	2.72E-05	1.19E-04	6.40E-06	2.80E-05	9.60E-06	4.20E-05	66.67%	66.67%
	Molybdenum	7439-98-7	8.37E-05	3.67E-04	no	yes	no	4.18E-06	1.83E-05	8.79E-05	3.85E-04	2.71E-05	1.19E-04	1.15E-04	5.03E-04	2.71E-05	1.19E-04	4.06E-05	1.78E-04	66.67%	66.67%
	Nickel	7440-02-0	1.60E-04	7.00E-04	yes	yes	no	7.99E-06	3.50E-05	1.68E-04	7.35E-04	5.17E-05	2.26E-04	2.19E-04	9.61E-04	5.17E-05	2.26E-04	7.75E-05	3.40E-04	66.67%	66.67%
	Zinc	7440-66-6	2.21E-03	9.66E-03	no	yes	no	1.10E-04	4.83E-04	2.32E-03	1.01E-02	7.14E-04	3.13E-03	3.03E-03	1.33E-02	7.14E-04	3.13E-03	1.07E-03	4.69E-03	66.67%	66.67%

ON Semiconductors, Pocatello, ID

Summary Boiler TAP Emssions

Toxic Air Pollutants	CAS #	Average	OEL or UR	EL	AAC	AACC	Baseline Over EL	Baseline % of EL	Growth Over EL	Growth % of EL
			(mg/m^3)	(lb/hr)	(mg/m^3)	(µg/m^3)				
Benzene	71-43-2	Annual	8.30E-06	8.00E-04		1.20E-01	no	20%	no	27%
Benzo(a)pyrene	50-32-8	Annual	3.30E-03	2.00E-06		3.00E-04	no	5%	no	6%
Formaldehyde	50-00-0	Annual	1.30E-05	5.10E-04		7.70E-02	yes	1119%	yes	1537%
Hexane	110-54-3	24-hr	1.80E+02	1.20E+01	9.00E+00		no	1%	no	2%
3-Methylcholanthrene	56-49-5	Annual	2.70E-03	2.50E-06		3.70E-04	no	5%	no	8%
Naphthalene	91-20-3	24-hr	5.00E+01	3.33E+00	2.50E+00		no	0%	no	0%
Pentane	109-66-0	24-hr	1.77E+03	1.18E+02	8.85E+01		no	0%	no	0%
Toluene	108-88-3	24-hr	3.75E+02	2.50E+01	1.88E+01		no	0%	no	0%
Arsenic	7440-38-2	Annual	4.30E-03	1.50E-06		2.30E-04	yes	1014%	yes	1393%
Barium	7440-39-3	24-hr	5.00E-01	3.30E-02	2.50E-02		no	1%	no	1%
Cadmium	7440-43-9	Annual	1.80E-03	3.70E-06		5.60E-04	yes	2262%	yes	3107%
Chromium	7440-47-3	24-hr	5.00E-01	3.30E-02	2.50E-02		no	0%	no	0%
Cobalt	7440-48-4	24-hr	5.00E-02	3.30E-03	2.50E-03		no	0%	no	0%
Copper	7440-50-8	24-hr	2.00E-01	1.30E-02	1.00E-02		no	0%	no	1%
Manganese	7439-96-5	24-hr	1.00E+00	6.70E-02	5.00E-02		no	0%	no	0%
Mercury	7439-97-6	24-hr	5.00E-02	3.00E-03	2.50E-03		no	1%	no	1%
Molybdenum	7439-98-7	24-hr	1.00E+01	6.67E-01	5.00E-01		no	0%	no	0%
Nickel	7440-02-0	Annual	2.40E-04	2.70E-05		4.20E-03	yes	592%	yes	813%
Zinc	7440-66-6	24-hr	–	6.67E-01	5.00E-01		no	0%	no	0%

Summary Boiler HAP Emssions

Hazardous Air Pollutants	CAS #	Baseline HAP		Projected Growth HAP	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Benzene	71-43-2	1.68E-04	7.35E-04	5.17E-05	2.26E-04
Benzo(a)pyrene	50-32-8	9.59E-08	4.20E-07	2.95E-08	1.29E-07
Formaldehyde	50-00-0	5.99E-03	2.62E-02	1.85E-03	8.09E-03
Hexane	110-54-3	1.44E-01	6.30E-01	4.43E-02	1.94E-01
3-Methylcholanthrene	56-49-5	NA	NA	NA	NA
Naphthalene	91-20-3	4.87E-05	2.13E-04	1.50E-05	6.58E-05
Pentane	109-66-0	NA	NA	NA	NA
Toluene	108-88-3	2.72E-04	1.19E-03	8.37E-05	3.67E-04
Arsenic	7440-38-2	1.60E-05	7.00E-05	4.92E-06	2.16E-05
Barium	7440-39-3	NA	NA	NA	NA
Cadmium	7440-43-9	8.79E-05	3.85E-04	2.71E-05	1.19E-04
Chromium	7440-47-3	1.12E-04	4.90E-04	3.45E-05	1.51E-04
Cobalt	7440-48-4	6.71E-06	2.94E-05	2.07E-06	9.06E-06
Copper	7440-50-8	NA	NA	NA	NA
Manganese	7439-96-5	3.04E-05	1.33E-04	9.35E-06	4.10E-05
Mercury	7439-97-6	2.08E-05	9.10E-05	6.40E-06	2.80E-05
Molybdenum	7439-98-7	NA	NA	NA	NA
Nickel	7440-02-0	1.68E-04	7.35E-04	5.17E-05	2.26E-04
Zinc	7440-66-6	NA	NA	NA	NA

Emergency Generator Emissions

ON Semiconductors, Pocatello, ID

Fuel Burning Equipment - Emergency Generators

Location	Unit ID	Manufacturer / Model Number	Install Year	Gen Rated Output HP	Engine Rated Output HP	On-line Rating (hrs/yr) Actual	On-line Rating (hrs/yr) Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	Emission Factor lb/MMBtu	Baseline Emissions lbs/hr	Baseline Emissions tons/yr	Remarks	FEC or Projected Growth lbs/hr	FEC or Projected Growth tons/yr	Total Potential Emissions lbs/hr	Total Potential Emissions tons/yr
					A		B	C	D			E	F = D*C/1E+06*E	G = B*F/2000				F	G
Building B	BEMGEN Emergency Generator	Onan 15.0 RJC 15 kW	1970	20		26	100	Natural Gas @ 1020 MMBTU/10^6S CF	255	NO_x	3.2-3.	2.21E+00	0.57	0.03	Supports Building B. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.			5.75E-01	2.87E-02
										CO	3.2-3.	3.72E+00	0.97	0.05				9.68E-01	4.84E-02
										SO_2	3.2-3.	5.88E-04	1.53E-04	7.65E-06				1.53E-04	7.65E-06
										VOC	3.2-3.	2.96E-02	7.70E-03	3.85E-04				7.70E-03	3.85E-04
										$PM_{2.5}$[2]	3.2-3.	9.50E-03	2.47E-03	1.24E-04				2.47E-03	1.24E-04
										HAPs	–	–	8.44E-03	4.22E-04				8.44E-03	4.22E-04
										1,1,2,2-Tetrachloroethane	3.2-3.	2.53E-05	6.58E-06	3.29E-07				6.58E-06	3.29E-07
										1,1,2-Trichloroethane	3.2-3.	1.53E-05	3.98E-06	1.99E-07				3.98E-06	1.99E-07
										1,1-Dichloroethane	3.2-3.	1.13E-05	2.94E-06	1.47E-07				2.94E-06	1.47E-07
										1.2-Dichloroethane	3.2-3.	1.13E-05	2.94E-06	1.47E-07				2.94E-06	1.47E-07
										1,2-Dichloropropane	3.2-3.	1.30E-05	3.38E-06	1.69E-07				3.38E-06	1.69E-07
										1,3-Butadiene	3.2-3.	6.63E-04	1.72E-04	8.62E-06				1.72E-04	8.62E-06
										1,3-Dichloropropene	3.2-3.	1.27E-05	3.30E-06	1.65E-07				3.30E-06	1.65E-07
										Acetaldehyde	3.2-3.	2.79E-03	7.26E-04	3.63E-05				7.26E-04	3.63E-05
										Acrolein	3.2-3.	2.63E-03	6.84E-04	3.42E-05				6.84E-04	3.42E-05
										Benzene	3.2-3.	1.58E-03	4.11E-04	2.05E-05				4.11E-04	2.05E-05
										Carbon Tetrachloride	3.2-3.	1.77E-05	4.60E-06	2.30E-07				4.60E-06	2.30E-07
										Chlorobenzene	3.2-3.	1.29E-05	3.36E-06	1.68E-07				3.36E-06	1.68E-07
										Chloroform	3.2-3.	1.37E-05	3.56E-06	1.78E-07				3.56E-06	1.78E-07
										Ethylene Dibromide	3.2-3.	2.48E-05	6.45E-06	3.23E-07				6.45E-06	3.23E-07
										Formaldehyde	3.2-3.	2.05E-02	5.33E-03	2.67E-04				5.33E-03	2.67E-04
										Methanol	3.2-3.	3.06E-03	7.96E-04	3.98E-05				7.96E-04	3.98E-05
										Methylene Chloride	3.2-3.	4.12E-05	1.07E-05	5.36E-07				1.07E-05	5.36E-07
										Naphthalene	3.2-3.	9.71E-05	2.53E-05	1.26E-06				2.53E-05	1.26E-06
										PAHs	3.2-3.	1.41E-04	3.67E-05	1.83E-06				3.67E-05	1.83E-06
										Styrene	3.2-3.	1.19E-05	3.10E-06	1.55E-07				3.10E-06	1.55E-07
										Toluene	3.2-3.	5.58E-04	1.45E-04	7.26E-06				1.45E-04	7.26E-06
										Vinyl Chloride	3.2-3.	7.18E-06	1.87E-06	9.34E-08				1.87E-06	9.34E-08
										Xylenes	3.2-3.	1.95E-04	5.07E-05	2.54E-06				5.07E-05	2.54E-06
Building C	CEMGENR Emergency Generator	Onan 15.0 RJC 15 kW	1974	20		26	100	Natural Gas @ 1020 MMBTU/10^6S CF	255	NO_x	3.2-3.	2.21E+00	0.57	2.87E-02	Supports Building C. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.			5.75E-01	2.87E-02
										CO	3.2-3.	3.72E+00	0.97	4.84E-02				9.68E-01	4.84E-02
										SO_2	3.2-3.	5.88E-04	1.53E-04	7.65E-06				1.53E-04	7.65E-06
										VOC	3.2-3.	2.96E-02	7.70E-03	3.85E-04				7.70E-03	3.85E-04
										$PM_{2.5}$[2]	3.2-3.	9.50E-03	2.47E-03	1.24E-04				2.47E-03	1.24E-04
										HAPs	–	–	8.44E-03	4.22E-04				8.44E-03	4.22E-04
										1,1,2,2-Tetrachloroethane	3.2-3.	2.53E-05	6.58E-06	3.29E-07				6.58E-06	3.29E-07
										1,1,2-Trichloroethane	3.2-3.	1.53E-05	3.98E-06	1.99E-07				3.98E-06	1.99E-07
										1,1-Dichloroethane	3.2-3.	1.13E-05	2.94E-06	1.47E-07				2.94E-06	1.47E-07
										1.2-Dichloroethane	3.2-3.	1.13E-05	2.94E-06	1.47E-07				2.94E-06	1.47E-07
										1,2-Dichloropropane	3.2-3.	1.30E-05	3.38E-06	1.69E-07				3.38E-06	1.69E-07
										1,3-Butadiene	3.2-3.	6.63E-04	1.72E-04	8.62E-06				1.72E-04	8.62E-06
										1,3-Dichloropropene	3.2-3.	1.27E-05	3.30E-06	1.65E-07				3.30E-06	1.65E-07
										Acetaldehyde	3.2-3.	2.79E-03	7.26E-04	3.63E-05				7.26E-04	3.63E-05
										Acrolein	3.2-3.	2.63E-03	6.84E-04	3.42E-05				6.84E-04	3.42E-05
										Benzene	3.2-3.	1.58E-03	4.11E-04	2.05E-05				4.11E-04	2.05E-05
										Carbon Tetrachloride	3.2-3.	1.77E-05	4.60E-06	2.30E-07				4.60E-06	2.30E-07
										Chlorobenzene	3.2-3.	1.29E-05	3.36E-06	1.68E-07				3.36E-06	1.68E-07
										Chloroform	3.2-3.	1.37E-05	3.56E-06	1.78E-07				3.56E-06	1.78E-07
										Ethylene Dibromide	3.2-3.	2.48E-05	6.45E-06	3.23E-07				6.45E-06	3.23E-07
										Formaldehyde	3.2-3.	2.05E-02	5.33E-03	2.67E-04				5.33E-03	2.67E-04
										Methanol	3.2-3.	3.06E-03	7.96E-04	3.98E-05				7.96E-04	3.98E-05
										Methylene Chloride	3.2-3.	4.12E-05	1.07E-05	5.36E-07				1.07E-05	5.36E-07
										Naphthalene	3.2-3.	9.71E-05	2.53E-05	1.26E-06				2.53E-05	1.26E-06
										PAHs	3.2-3.	1.41E-04	3.67E-05	1.83E-06				3.67E-05	1.83E-06
										Styrene	3.2-3.	1.19E-05	3.10E-06	1.55E-07				3.10E-06	1.55E-07
										Toluene	3.2-3.	5.58E-04	1.45E-04	7.26E-06				1.45E-04	7.26E-06
										Vinyl Chloride	3.2-3.	7.18E-06	1.87E-06	9.34E-08				1.87E-06	9.34E-08
										Xylenes	3.2-3.	1.95E-04	5.07E-05	2.54E-06				5.07E-05	2.54E-06

ON Semiconductors, Pocatello, ID

Fuel Burning Equipment - Emergency Generators

Location	Unit ID	Manufacturer / Model Number	Install Year	Gen Rated Output HP	Engine Rated Output HP	On-line Rating (hrs/yr) Actual	On-line Rating (hrs/yr) Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	lb/MMBtu	Baseline Emissions lbs/hr	Baseline Emissions tons/yr	Remarks	FEC or Projected Growth lbs/hr	FEC or Projected Growth tons/yr	Total Potential Emissions lbs/hr	Total Potential Emissions tons/yr
Building C (outside, S side)	CEMGENS Emergency Generator	Caterpillar 1250 kW	2001	1676	1818	26	100	Diesel @ 128,750 BTU/gal[a], 0.15% sulfur	48.9	NO_x	Factors based on actual engine test[b]		23.91	1.20	Supports Building D (Fab 9). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. [b]TMI Engine and Compressor Performance Test DM6686-00. Emissions and fuel rate are at 50% load. This is conservative since the generators are tested under no load. Fuel rate per engine test.			2.39E+01	1.20E+00
										CO			3.01	0.15				3.01E+00	1.51E-01
										PM_{10}			0.57	2.85E-02				5.70E-01	2.85E-02
										VOC			1.25	6.25E-02				1.25E+00	6.25E-02
										SO_2	3.4-1.	1.52E-03	9.53E-03	4.76E-04				9.53E-03	4.76E-04
										HAPs	–	–	9.90E-03	4.95E-04				9.90E-03	4.95E-04
										Acetaldehyde	3.4-3.	2.52E-05	1.58E-04	7.92E-06				1.58E-04	7.92E-06
										Acrolein	3.4-3.	7.88E-06	4.96E-05	2.48E-06				4.96E-05	2.48E-06
										Benzene	3.4-3.	7.76E-04	4.88E-03	2.44E-04				4.88E-03	2.44E-04
										Benzo(a)pyrene	3.4-4.	2.57E-07	1.62E-06	8.08E-08				1.62E-06	8.08E-08
										Formaldehyde	3.4-3.	7.89E-05	4.96E-04	2.48E-05				4.96E-04	2.48E-05
										Naphthalene	3.4-4.	1.30E-04	8.18E-04	4.09E-05				8.18E-04	4.09E-05
										PAHs	3.4-4	8.17E-05	5.14E-04	2.57E-05				5.14E-04	2.57E-05
										Toluene	3.4-3.	2.81E-04	1.77E-03	8.84E-05				1.77E-03	8.84E-05
										Xylenes	3.4-3.	1.93E-04	1.21E-03	6.07E-05				1.21E-03	6.07E-05
Building D	DEMGEN Emergency Generator	Onan 30.OEK-15R/9336M 30 kW	1983	40	82	26	100	Natural Gas @ 1020 MMBTU/10^6SCF	600	NO_x	3.2-3.	2.21E+00	1.35	0.07	Supports Building D. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.			1.35E+00	6.76E-02
										CO	3.2-3.	3.72E+00	2.28	0.11				2.28E+00	1.14E-01
										SO_2	3.2-3.	5.88E-04	3.60E-04	1.80E-05				3.60E-04	1.80E-05
										VOC	3.2-3.	2.96E-02	1.81E-02	9.06E-04				1.81E-02	9.06E-04
										$PM_{2.5}$[2]	3.2-3.	9.50E-03	5.81E-03	2.91E-04				5.81E-03	2.91E-04
										HAPs	–	–	1.98E-02	9.92E-04				1.98E-02	9.92E-04
										1,1,2,2-Tetrachloroethane	3.2-3.	2.53E-05	1.55E-05	7.74E-07				1.55E-05	7.74E-07
										1,1,2-Trichloroethane	3.2-3.	1.53E-05	9.36E-06	4.68E-07				9.36E-06	4.68E-07
										1,1-Dichloroethane	3.2-3.	1.13E-05	6.92E-06	3.46E-07				6.92E-06	3.46E-07
										1,2-Dichloroethane	3.2-3.	1.13E-05	6.92E-06	3.46E-07				6.92E-06	3.46E-07
										1,2-Dichloropropane	3.2-3.	1.30E-05	7.96E-06	3.98E-07				7.96E-06	3.98E-07
										1,3-Butadiene	3.2-3.	6.63E-04	4.06E-04	2.03E-05				4.06E-04	2.03E-05
										1,3-Dichloropropene	3.2-3.	1.27E-05	7.77E-06	3.89E-07				7.77E-06	3.89E-07
										Acetaldehyde	3.2-3.	2.79E-03	1.71E-03	8.54E-05				1.71E-03	8.54E-05
										Acrolein	3.2-3.	2.63E-03	1.61E-03	8.05E-05				1.61E-03	8.05E-05
										Benzene	3.2-3.	1.58E-03	9.67E-04	4.83E-05				9.67E-04	4.83E-05
										Carbon Tetrachloride	3.2-3.	1.77E-05	1.08E-05	5.42E-07				1.08E-05	5.42E-07
										Chlorobenzene	3.2-3.	1.29E-05	7.89E-06	3.95E-07				7.89E-06	3.95E-07
										Chloroform	3.2-3.	1.37E-05	8.38E-06	4.19E-07				8.38E-06	4.19E-07
										Ethylene Dibromide	3.2-3.	2.48E-05	1.52E-05	7.59E-07				1.52E-05	7.59E-07
										Formaldehyde	3.2-3.	2.05E-02	1.25E-02	6.27E-04				1.25E-02	6.27E-04
										Methanol	3.2-3.	3.06E-03	1.87E-03	9.36E-05				1.87E-03	9.36E-05
										Methylene Chloride	3.2-3.	4.12E-05	2.52E-05	1.26E-06				2.52E-05	1.26E-06
										Naphthalene	3.2-3.	9.71E-05	5.94E-05	2.97E-06				5.94E-05	2.97E-06
										PAHs	3.2-3.	1.41E-04	8.63E-05	4.31E-06				8.63E-05	4.31E-06
										Styrene	3.2-3.	1.19E-05	7.28E-06	3.64E-07				7.28E-06	3.64E-07
										Toluene	3.2-3.	5.58E-04	3.41E-04	1.71E-05				3.41E-04	1.71E-05
										Vinyl Chloride	3.2-3.	7.18E-06	4.39E-06	2.20E-07				4.39E-06	2.20E-07
										Xylenes	3.2-3.	1.95E-04	1.19E-04	5.97E-06				1.19E-04	5.97E-06

ON Semiconductors, Pocatello, ID

Fuel Burning Equipment - Emergency Generators

Location	Unit ID	Manufacturer	Model Number	Install Year	Gen Rated Output HP	Engine Rated Output HP	On-line Rating (hrs/yr) Actual	On-line Rating (hrs/yr) Used for PTE	Fuel	Fuel Rate SCFH or GPH	Emission Factor	AP-42 Table[1]	lb/MMBtu	Baseline Emissions lbs/hr	Baseline Emissions tons/yr	Remarks	FEC or Projected Growth lbs/hr	FEC or Projected Growth tons/yr	Total Potential Emissions lbs/hr	Total Potential Emissions tons/yr
Building D Support Room 1138	DMREMGEN Emergency Generator	Kohler	60RZ72 60 kW	1996	80	126	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	960	NO_x	3.2-3.	2.27E+00	2.22	0.11	Supports Bldg D (Fab 9) and GH 10. AP-42 classification: 4-stroke, rich-burn engine, 60% load.			2.22E+00	1.11E-01
											CO	3.2-3.	3.51E+00	3.44	0.17				3.44E+00	1.72E-01
											SO_2	3.2-3.	5.88E-04	5.76E-04	2.88E-05				5.76E-04	2.88E-05
											VOC	3.2-3.	2.96E-02	2.90E-02	1.45E-03				2.90E-02	1.45E-03
											$PM_{2.5}$[2]	3.2-3.	9.50E-03	9.30E-03	4.65E-04				9.30E-03	4.65E-04
											HAPs	–	–	3.18E-02	1.59E-03				3.18E-02	1.59E-03
											1,1,2,2-Tetrachloroethane	3.2-3.	2.53E-05	2.48E-05	1.24E-06				2.48E-05	1.24E-06
											1,1,2-Trichloroethane	3.2-3.	1.53E-05	1.50E-05	7.49E-07				1.50E-05	7.49E-07
											1,1-Dichloroethane	3.2-3.	1.13E-05	1.11E-05	5.53E-07				1.11E-05	5.53E-07
											1.2-Dichloroethane	3.2-3.	1.13E-05	1.11E-05	5.53E-07				1.11E-05	5.53E-07
											1,2-Dichloropropane	3.2-3.	1.30E-05	1.27E-05	6.36E-07				1.27E-05	6.36E-07
											1,3-Butadiene	3.2-3.	6.63E-04	6.49E-04	3.25E-05				6.49E-04	3.25E-05
											1,3-Dichloropropene	3.2-3.	1.27E-05	1.24E-05	6.22E-07				1.24E-05	6.22E-07
											Acetaldehyde	3.2-3.	2.79E-03	2.73E-03	1.37E-04				2.73E-03	1.37E-04
											Acrolein	3.2-3.	2.63E-03	2.58E-03	1.29E-04				2.58E-03	1.29E-04
											Benzene	3.2-3.	1.58E-03	1.55E-03	7.74E-05				1.55E-03	7.74E-05
											Carbon Tetrachloride	3.2-3.	1.77E-05	1.73E-05	8.67E-07				1.73E-05	8.67E-07
											Chlorobenzene	3.2-3.	1.29E-05	1.26E-05	6.32E-07				1.26E-05	6.32E-07
											Chloroform	3.2-3.	1.37E-05	1.34E-05	6.71E-07				1.34E-05	6.71E-07
											Ethylene Dibromide	3.2-3.	2.48E-05	2.43E-05	1.21E-06				2.43E-05	1.21E-06
											Formaldehyde	3.2-3.	2.05E-02	2.01E-02	1.00E-03				2.01E-02	1.00E-03
											Methanol	3.2-3.	3.06E-03	3.00E-03	1.50E-04				3.00E-03	1.50E-04
											Methylene Chloride	3.2-3.	4.12E-05	4.03E-05	2.02E-06				4.03E-05	2.02E-06
											Naphthalene	3.2-3.	9.71E-05	9.51E-05	4.75E-06				9.51E-05	4.75E-06
											PAHs	3.2-3.	1.41E-04	1.38E-04	6.90E-06				1.38E-04	6.90E-06
											Styrene	3.2-3.	1.19E-05	1.17E-05	5.83E-07				1.17E-05	5.83E-07
											Toluene	3.2-3.	5.58E-04	5.46E-04	2.73E-05				5.46E-04	2.73E-05
											Vinyl Chloride	3.2-3.	7.18E-06	7.03E-06	3.52E-07				7.03E-06	3.52E-07
											Xylenes	3.2-3.	1.95E-04	1.91E-04	9.55E-06				1.91E-04	9.55E-06
Building G (outside, E side)	GEEMGEN Emergency Generator	Caterpillar	1250 kW	1998	1676	1818	26	100	Diesel @ 128,750 BTU/gal[a] 0.15% sulfur	46.6	NO_x	Factors based on actual engine test[b]		26.54	1.33	Supports Building H (Fab 10). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. [b]TMI Engine and Compressor Performance Test TM3401. Emissions and fuel rate are at 50% load. This is conservative since the generators are tested under no load. Fuel rate per engine test.			2.65E+01	1.33E+00
											CO			4.07	0.20				4.07E+00	2.04E-01
											PM_{10}			0.72	3.60E-02				7.20E-01	3.60E-02
											VOC			1.10	5.50E-02				1.10E+00	5.50E-02
											SO_2	3.4-1	1.52E-03	9.08E-03	4.54E-04				9.08E-03	4.54E-04
											HAPs	–	–	9.44E-03	4.72E-04				9.44E-03	4.72E-04
											Acetaldehyde	3.4-3.	2.52E-05	1.51E-04	7.55E-06				1.51E-04	7.55E-06
											Acrolein	3.4-3.	7.88E-06	4.72E-05	2.36E-06				4.72E-05	2.36E-06
											Benzene	3.4-3.	7.76E-04	4.65E-03	2.33E-04				4.65E-03	2.33E-04
											Benzo(a)pyrene	3.4-4.	2.57E-07	1.54E-06	7.70E-08				1.54E-06	7.70E-08
											Formaldehyde	3.4-3.	7.89E-05	4.73E-04	2.37E-05				4.73E-04	2.37E-05
											Naphthalene	3.4-4.	1.30E-04	7.79E-04	3.90E-05				7.79E-04	3.90E-05
											PAHs	3.4-4	8.17E-05	4.90E-04	2.45E-05				4.90E-04	2.45E-05
											Toluene	3.4-3.	2.81E-04	1.68E-03	8.42E-05				1.68E-03	8.42E-05
											Xylenes	3.4-3.	1.93E-04	1.16E-03	5.79E-05				1.16E-03	5.79E-05
Building G (outside, S side)	GOEMGEN Emergency Generator	Caterpillar	1825 kW	2005	2447	2593	26	100	Diesel @ 128,750 BTU/gal[a] 0.15% sulfur	67.3	NO_x	Factors based on actual engine test[b]		17.66	0.88	Supports Building H (Fab 10). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. Fuel rate per engine test. [b]Cat Gen Set Package Emission Certification. Emissions and fuel rate are at 50% load. This is conservative since the generators are tested under no load.			1.77E+01	8.83E-01
											CO			1.37	0.07				1.37E+00	6.85E-02
											PM_{10}			0.43	0.02				4.30E-01	2.15E-02
											VOC			0.76	0.04				7.60E-01	3.80E-02
											SO_2	3.4-1	1.52E-03	1.31E-02	6.56E-04				1.31E-02	6.56E-04
											HAPs	–	–	1.36E-02	6.82E-04				1.36E-02	6.82E-04
											Acetaldehyde	3.4-3.	2.52E-05	2.18E-04	1.09E-05				2.18E-04	1.09E-05
											Acrolein	3.4-3.	7.88E-06	6.83E-05	3.41E-06				6.83E-05	3.41E-06
											Benzene	3.4-3.	7.76E-04	6.72E-03	3.36E-04				6.72E-03	3.36E-04
											Benzo(a)pyrene	3.4-4.	2.57E-07	2.23E-06	1.11E-07				2.23E-06	1.11E-07
											Formaldehyde	3.4-3.	7.89E-05	6.84E-04	3.42E-05				6.84E-04	3.42E-05
											Naphthalene	3.4-4.	1.30E-04	1.13E-03	5.63E-05				1.13E-03	5.63E-05
											PAHs	3.4-4	8.17E-05	7.08E-04	3.54E-05				7.08E-04	3.54E-05
											Toluene	3.4-3.	2.81E-04	2.43E-03	1.22E-04				2.43E-03	1.22E-04
											Xylenes	3.4-3.	1.93E-04	1.67E-03	8.36E-05				1.67E-03	8.36E-05

[1] AP 42, Fifth Edition, Volume I Chapter 3: Stationary Internal Combustion Sources, Section 3.2, Natural Gas-fired Reciprocating Engines, August 2000 and Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines, October 1996.

[2] Considered ≤ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM_{10}(filterable) = $PM_{2.5}$(filterable).

ON Semiconductors, Pocatello, ID

Summary Emergency Gnerator Emissions

Annual Fuel Use		Emission	CAS No	lbs/hr	tons/yr	HAP	TAP	lbs/hr	tons/year
				Baseline				Total (with Projected Growth)	
Nat.Gas MCF/Yr	Diesel Gal/Yr	NO_x		7.28E+01	3.64E+00	--	--	7.28E+01	3.64E+00
		CO		1.61E+01	8.05E-01	--	--	1.61E+01	8.05E-01
		PM_{10}		1.72E+00	8.60E-02	--	--	1.72E+00	8.60E-02
		$PM_{2.5}$		2.01E-02	1.00E-03	--	--	2.01E-02	1.00E-03
		VOC		3.17E+00	1.59E-01	--	--	3.17E+00	1.59E-01
		SO_2		3.30E-02	1.65E-03	--	--	3.30E-02	1.65E-03
		HAPs		1.01E-01	5.07E-03	--	--	1.01E-01	5.07E-03
		1,1,2,2-Tetrachloroethane	79-34-5	5.34E-05	2.67E-06	yes	yes	5.34E-05	2.67E-06
		1,1,2-Trichloroethane	79-00-5	3.23E-05	1.62E-06	yes	yes	3.23E-05	1.62E-06
		1,1-Dichloroethane	75-34-3	2.39E-05	1.19E-06	yes	yes	2.39E-05	1.19E-06
		1.2-Dichloroethane	107-06-2	2.39E-05	1.19E-06	yes	yes	2.39E-05	1.19E-06
		1,2-Dichloropropane	78-87-5	2.74E-05	1.37E-06	yes	yes	2.74E-05	1.37E-06
		1,3-Butadiene	106-99-0	1.40E-03	7.00E-05	yes	yes	1.40E-03	7.00E-05
		1,3-Dichloropropene	542-75-6	2.68E-05	1.34E-06	yes	yes	2.68E-05	1.34E-06
		Acetaldehyde	75-07-0	6.42E-03	3.21E-04	yes	yes	6.42E-03	3.21E-04
		Acrolein	107-02-8	5.72E-03	2.86E-04	yes	yes	5.72E-03	2.86E-04
207	16,272	Benzene	71-43-2	1.96E-02	9.80E-04	yes	yes	1.96E-02	9.80E-04
		Benzo(a)pyren	50-32-8	5.38E-06	2.69E-07	yes	yes	5.38E-06	2.69E-07
		Carbon Tetrachloride	56-23-5	3.74E-05	1.87E-06	yes	yes	3.74E-05	1.87E-06
		Chlorobenzene	108-90-7	2.72E-05	1.36E-06	yes	yes	2.72E-05	1.36E-06
		Chloroform	67-66-3	2.89E-05	1.45E-06	yes	yes	2.89E-05	1.45E-06
		Ethylene Dibromide	106-93-4	5.24E-05	2.62E-06	yes	yes	5.24E-05	2.62E-06
		Formaldehyde	50-00-0	4.49E-02	2.25E-03	yes	yes	4.49E-02	2.25E-03
		Methanol	67-56-1	6.46E-03	3.23E-04	yes	yes	6.46E-03	3.23E-04
		Methylene Chloride	75-09-2	8.70E-05	4.35E-06	yes	yes	8.70E-05	4.35E-06
		Naphthalene	91-20-3	2.93E-03	1.46E-04	yes	yes	2.93E-03	1.46E-04
		PAHs		2.01E-03	1.01E-04	yes	yes	2.01E-03	1.01E-04
		Styrene	100-42-5	2.51E-05	1.26E-06	yes	yes	2.51E-05	1.26E-06
		Toluene	108-88-3	7.07E-03	3.53E-04	yes	yes	7.07E-03	3.53E-04
		Vinyl Chloride	75-01-4	1.52E-05	7.58E-07	yes	yes	1.52E-05	7.58E-07
		Xylenes	1330-20-7	4.46E-03	2.23E-04	yes	yes	4.46E-03	2.23E-04

Summary Emergency Generator TAP Emssions

Toxic Air Pollutants	CAS #	Average	24-hr Avg	Annual Avg	OEL or UR	EL	AAC	AACC	Baseline Over EL	Baseline %of EL	Growth Over EL	Growth %of EL
					(mg/m^3)	(lb/hr)	(mg/m^3)	(µg/m^3)				
1,1,2,2-Tetrachloroethane	79-34-5	Annual	NA	6.10E-07	5.80E-05	1.10E-05		1.70E-02	yes	486%	yes	486%
1,1,2-Trichloroethane	79-00-5	Annual	NA	3.69E-07	1.60E-05	4.20E-04		6.20E-02	no	8%	no	8%
1,1-Dichloroethane	75-34-3	24-hr	9.94E-07	NA	4.05E+02	2.70E+01	2.03E+01		no	0%	no	0%
1.2-Dichloroethane	107-06-2	24-hr	9.94E-07	NA	4.00E+01	2.67E+00	2.00E+00		no	0%	no	0%
1,2-Dichloropropane	78-87-5	24-hr	1.14E-06	NA	3.47E+02	2.31E+01	1.74E+01		no	0%	no	0%
1,3-Butadiene	106-99-0	Annual	NA	1.60E-05	2.80E-04	2.40E-05		3.60E-03	yes	5833%	yes	5833%
1,3-Dichloropropene	542-75-6	Annual	NA	3.06E-07	3.50E-01	1.90E-07		2.90E-06	yes	14113%	yes	14113%
Acetaldehyde	75-07-0	Annual	NA	7.33E-05	2.20E-06	3.00E-03		4.50E-01	yes	214%	yes	214%
Acrolein	107-02-8	24-hr	2.38E-04	NA	2.50E-01	1.70E-02	1.25E-02		no	34%	no	34%
Benzene	71-43-2	Annual	NA	2.24E-04	8.30E-06	8.00E-04		1.20E-01	yes	2449%	yes	2449%
Benzo(a)pyrene	50-32-8	Annual	NA	6.15E-08	3.30E-03	2.00E-06		3.00E-04	yes	269%	yes	269%
Carbon Tetrachloride	56-23-5	Annual	NA	4.27E-07	1.50E+05	4.40E-04		6.70E-02	no	8%	no	8%
Chlorobenzene	108-90-7	24-hr	1.13E-06	NA	3.50E+02	2.33E+01	1.75E+01		no	0%	no	0%
Chloroform	67-66-3	Annual	NA	3.30E-07	2.30E-05	2.80E-04		4.30E-02	no	10%	no	10%
Ethylene Dibromide	106-93-4	Annual	NA	5.98E-07	2.20E-04	3.00E-05		4.50E-03	yes	175%	yes	175%
Formaldehyde	50-00-0	Annual	NA	5.13E-04	1.30E-05	5.10E-04		7.70E-02	yes	8811%	yes	8811%
Methanol	67-56-1	24-hr	2.69E-04	NA	2.60E+02	1.73E+01	1.30E+01		no	0%	no	0%
Methylene Chloride	75-09-2	Annual	NA	9.93E-07	4.10E-06	1.60E-03		2.40E-01	no	5%	no	5%
Naphthalene	91-20-3	24-hr	1.22E-04	NA	5.00E+01	3.33E+00	2.50E+00		no	0%	no	0%
PAH	NA	Annual	NA	2.29E-05	7.30E-05	9.10E-05		1.40E-02	yes	2209%	yes	2209%
Styrene	100-42-5	24-hr	1.05E-06	NA	--	6.67E+00	1.00E+00		no	0%	no	0%
Toluene	108-88-3	24-hr	2.94E-04	NA	3.75E+02	2.50E+01	1.88E+01		no	0%	no	0%
Vinyl Chloride	75-01-4	Annual	NA	1.73E-07	7.10E-06	9.40E-04		1.40E-01	no	2%	no	2%
Xylene	1330-20-7	24-hr	1.86E-04	NA	4.35E+02	2.90E+01	2.18E+01		no	0%	no	0%

Cooling Tower Emissions

ON Semiconductors, Pocatello, ID

Facility Equipment - Cooling Towers

Location	Unit ID	Conductivity	Total Disolved Solids[1]	On-line Rating (hrs/yr)	MAX FLOW	Cooling Water	Emission Factor[2]			Baseline Emissions[4]		Remarks	Increase for FEC[5]		Total Emissions	
		(µmho/cm)	(ppm)	Used for PTE	(GPM)	(GPH)		AP-42 Table	Total Drift lb/10^3 gal	lbs/hr	tons/yr		lbs/hr	tons/yr	lbs/hr	tons/yr
		A	B = A/1E+06*640,000	C	D	E = D*60			F	G =E*F/1000*B/1E+06	H = C*G/2000		I = G*100%	J = I*C/2000	K = G + I	L = H + J
Building B	BCT1	2,900	1,856	8,760	1,870	112,200	PM_{10}	13.4-1	1.70E+00	0.35	1.55	Vertical discharge, Crossflow, Induced draft. One tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).			0.35	1.55
Building B	BCT2	2,900	1,856	4,380	858	51,480	PM_{10}	13.4-1	1.70E+00	0.16	0.36	Vertical discharge, Crossflow, Induced draft. One tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.			0.16	0.36
Building C	CCT1	2,900	1,856	8,760	1,600	96,000	PM_{10}	13.4-1	1.70E+00	0.30	1.33	Vertical discharge, Crossflow, Induced draft. One tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).			0.30	1.33
Building C	CCT2	2,900	1,856	4,380	1,600	96,000	PM_{10}	13.4-1	1.70E+00	0.30	0.66	Vertical discharge, Crossflow, Induced draft. One tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.			0.30	0.66
Building D	DCT1	2,900	1,856	8,760	1,787	107,220	PM_{10}	13.4-1	1.70E+00	0.34	1.48	Vertical discharge, Crossflow, Induced draft. One tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).			0.34	1.48
Building D	DCT2	2,900	1,856	4,380	1,787	107,220	PM_{10}	13.4-1	1.70E+00	0.34	0.74	Vertical discharge, Crossflow, Induced draft. One tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.			0.34	0.74
Building G	GCT1	2,900	1,856	8,760	3,000	180,000	PM_{10}	13.4-1	1.70E+00	0.57	2.49	Vertical discharge, Crossflow, Induced draft. Both towers (GCT1 and GCT2) are assumed to operate year round.	0.57	2.49	1.14	4.98
Building G	GCT2	2,900	1,856	8,760	3,000	180,000	PM_{10}	13.4-1	1.70E+00	0.57	2.49	Vertical discharge, Crossflow, Induced draft. Both towers (GCT1 and GCT2) are assumed to operate year round.	0.57	2.49	1.14	4.98

1. The web site http://www.lenntech.com/unit-conversion-calculator/tds_engels.htm provided the conversion from umho/cm to ppm.

2. AP 42, Fifth Edition, Volume I Chapter 13: Miscellaneous Sources, Section 13.4, Wet Cooling Towers, February 1980.

3. In calculating the potential emissions, the stand-by cooling towers for Buildings B and C are not included since only two of the four cooling towers is operational at one time (where there is a size difference, the emissions are calculated for the larger cooling tower).

4. AP 42, Section 13.4, assumed all PM emitted from cooling towers to be PM-10. Therefore, the PM emission factors presented here were used to estimate PM-10 emissions.

5. FEC proposed growth is based on the increase in emissions above the baseline that two future Cooling Towers would have. The FEC proposed growth is based on the cooling tower size, type, and manufacture as the existing Building G towers.

6. Protential Growth is based on the size, type, and manufacture of the existing Bld. G cooling towers.

Cooling Tower Emissions Summary		
	lbs/hr	tons/yr
PM_{10}	2.93	11.09
Operational Variability	0.00	0.00
Proposed Growth[6]	1.14	4.98
FEC	4.07	16.07

FAB 9

ON Semiconductors, Pocatello, ID

FAB 9 Chemical Usage

FAB 9 Chemical Products [1]	Process [1]	Usage Rate 2007 [1] (containers/yr)	Container Weight/Size [1]	Units [1]	Gallons per container	Specific Gravity	Density (lbs/gal)	Weight per Container[7] (lbs/container)	Usage Rate (lbs/yr)	Usage Rate (lbs/yr)		CAS Number [1,2]	Average Constituent Concentration [1] (wt.%)	Constituent Usage Rate (lbs/yr)	2002 Waste Recovery[6] (%)	Emission Rate (lb/hr)[6]	Uncontrolled Emission Factor [3,6]	Uncontrolled Emission Rate with Emission Factor Applied (lb/hr)
		A	B		C	D	E = D * ρ_{water}	F = See Note 7	G = A*F	H				I	J = H*I	K	L = [J*(1-K)]/8760	M	N = L*M
13:2 Buffered HF Etch, ppb, Drums	Wet Chemical Station	27.0	440.0	lbs				440.00	11880.00	11880.00	ammonium fluoride	12125-01-8	40.0%	4752.00		5.42E-01	30.0%	1.83E-01
13:2 Buffered HF Etch, ppb, Drums	Wet Chemical Station									11880.00	Hydrofluoric acid	7664-39-3	7.0%	831.60		9.49E-02	30.0%	2.85E-02
20:1 BOE EL-UM, Drums	Wet Chemical Station	0.0	440.0	lbs				440.00	0.00	0.00	ammonium fluoride	12125-01-8	40.0%	0.00		0.00E+00	30.0%	0.00E+00
20:1 BOE EL-UM, Drums	Wet Chemical Station									0.00	Hydrofluoric acid	7664-39-3	10.0%	0.00		0.00E+00	30.0%	0.00E+00
20:1 Buffered HF Etch, ppb, Drums	Wet Chemical Station	4.0	440.0	lbs				440.00	1760.00	1760.00	ammonium fluoride	12125-01-8	40.0%	704.00		8.04E-02	30.0%	2.41E-02
20:1 Buffered HF Etch, ppb, Drums	Wet Chemical Station									1760.00	Hydrofluoric acid	7664-39-3	10.0%	176.00		2.01E-02	30.0%	6.03E-03
50:1 HF	Wet Chemical Station	0.0	484.0	lbs				484.00	0.00	0.00	Hydrofluoric acid	7664-39-3	49.0%	0.00		0.00E+00	30.0%	0.00E+00
Accuglass #111 LT	Wafer Coating	48.0	1.0	liters	0.26	0.85	7.09	1.87	89.89	89.89	Acetone	67-64-1	23.0%	20.67	19%	1.92E-03	90.0%	1.73E-03
Accuglass #111 LT	Wafer Coating									89.89	ethyl alcohol	64-17-5	11.0%	9.89	3%	1.10E-03	90.0%	9.89E-04
Accuglass #111 LT	Wafer Coating									89.89	Isopropanol	67-63-0	46.0%	41.35	94%	3.02E-04	90.0%	2.72E-04
Accuglass #111 LT	Wafer Coating									89.89	methylsiloxane polymer	67763-97-4	4.0%	3.60		4.10E-04	90.0%	3.69E-04
Accuglass #111 LT	Wafer Coating									89.89	n-butyl alcohol	71-36-3	8.0%	7.19		8.21E-04	90.0%	7.39E-04
Acetic Acid, Bottle	Wafer Etchant (TD assume 90% EF)	1936.0	8.0	lbs				8.00	15488.00	15488.00	Acetic Acid	64-19-7	99.7%	15441.54		1.76E+00	90.0%	1.59E+00
Acetone, Bottle	Wipe Cleaning	20.0	8.0	lbs				8.00	160.00	160.00	Acetone	67-64-1	100.0%	160.00	19%	1.49E-02	100.0%	1.49E-02
Acetone, Drum	Solvent Stations	67.0	350.0	lbs				350.00	23450.00	23450.00	Acetone	67-64-1	100.0%	23450.00	19%	2.18E+00	30.0%	6.54E-01
Ammonia,Anhydrous	Wafer Etchant (TD assume 90% EF)	3.0	50.0	lbs				50.00	150.00	150.00	Ammonia	7664-41-7	100.0%	150.00		1.71E-02	90.0%	1.54E-02
Ammonium Fluoride, Bottle	Wet Chemical Station	16.0	9.0	lbs				9.00	144.00	144.00	ammonium fluoride	12125-01-8	40.0%	57.60		6.58E-03	30.0%	1.97E-03
Ammonium Hydroxide, Bottle	Wet Chemical Station	1132.0	8.0	lbs				8.00	9056.00	9056.00	Ammonium hydroxide	1336-21-6	29.0%	2626.24		3.00E-01	30.0%	8.99E-02
Ammonium Hydroxide, ppb, Drums	Wet Chemical Station	50.0	375.0	lbs				375.00	18750.00	18750.00	Ammonium hydroxide	1336-21-6	29.0%	5437.50		6.21E-01	30.0%	1.86E-01
Arsine 30% Bal Hydrogen	Electrochemically Destroyed (90% EF)	26.0	2.8	cu ft.	20.95			0.544	14.16	14.16	Arsine	7784-42-1	30.0%	4.25		4.85E-04	90.0%	4.36E-04
Arsine, SDS 216 g. fill	Electrochemically Destroyed (90% EF)	0.0	400.0	grams				0.88	0.00	0.00	Arsine	7784-42-1	100.0%	0.00		0.00E+00	90.0%	0.00E+00
AZ P4620 Photoresist	Electrochemically Destroyed (90% EF)	0.0	9.0	lbs				9.00	0.00	0.00	1 methoxy 2 propyanol acetate	108-65-6	62.5%	0.00	100%	0.00E+00	90.0%	0.00E+00
AZ P4620 Photoresist	Electrochemically Destroyed (90% EF)									0.00	Cresol Novalak Resin	NA	35.0%	0.00		0.00E+00	90.0%	0.00E+00
AZ P4620 Photoresist	Electrochemically Destroyed (90% EF)									0.00	Diazonaphthohydroquinone sulfonic acid esters	5610-94-6	3.0%	0.00		0.00E+00	90.0%	0.00E+00
Boron Trichloride ULSI	Electrochemically Destroyed (90% EF)	6.0	70.0	lbs				70.00	420.00	420.00	Boron trichloride	10294-34-5	100.0%	420.00		4.79E-02	90.0%	4.32E-02
Boron Trifluoride B-11 350gm	Electrochemically Destroyed (90% EF)	9.0	350.0	grams				0.77	6.95	6.95	Boron trifloride	7637-07-2	100.0%	6.95		7.93E-04	90.0%	7.14E-04
Chlorine ULSI	Electrochemically Destroyed (90% EF)	11.0	70.0	lbs				70.00	770.00	770.00	Chlorine	7782-50-5	100.0%	770.00		8.79E-02	90.0%	7.91E-02
Chloroform, Cannister	Wafer Etchant (TD assume 90% EF)	6.0	1.5	liters	0.40	1.492	12.44	4.93	29.58	29.58	Chloroform	66-87-3	100.0%	29.58		3.38E-03	90.0%	3.04E-03
Defreckle Etch	Electrochemically Destroyed (90% EF)	30.0	540.0	lbs				540.00	16200.00	16200.00	Nitric Acid	7697-37-2	65.0%	10530.00		1.20E+00	90.0%	1.08E+00
Defreckle Etch	Electrochemically Destroyed (90% EF)									16200.00	Ammonium Fluoride	12125-01-8	3.0%	486.00		5.55E-02	90.0%	4.99E-02
Dichlorosilane	Wafer Coating	3.0	50.0	lbs				50.00	150.00	150.00	Dichlorosilane	4109-96-0	100.0%	150.00		1.71E-02	90.0%	1.54E-02
Ethyl Lactate	Wafer Coating	148.0	16	kg				35.27	5220.55	5220.55	Ethyl lactate	97-64-3	100.0%	5220.55	94%	3.82E-02	90.0%	3.44E-02
Freon (Halocarbon) 116 ULSI	Wafer Etchant (TD assume 90% EF)	25.0	95.0	lbs				95.00	2375.00	2375.00	hexafluoroethane	76-16-4	100.0%	2375.00		2.71E-01	90.0%	2.44E-01
Freon (Halocarbon) 14 ULSI	Wafer Etchant (TD assume 90% EF)	32.0	50.0	lbs				50.00	1600.00	1600.00	tetrafluoromethane	75-73-0	100.0%	1600.00		1.83E-01	90.0%	1.64E-01
Freon (Halocarbon) 23	Wafer Etchant (TD assume 90% EF)	0.0	70.0	lbs				70.00	0.00	0.00	Trifluoromethane	75-46-7	100.0%	0.00		0.00E+00	90.0%	0.00E+00
Freon (Halocarbon) 23 ULSI	Wafer Etchant (TD assume 90% EF)	6.0	70.0	lbs				70.00	420.00	420.00	Trifluoromethane	75-46-7	100.0%	420.00		4.79E-02	90.0%	4.32E-02
H.M.D.S. 100%, Bottle	Wafer Coating	52.0	6.4	lbs				6.42	333.93	333.93	hexamethyldisilazane	999-97-3	100.0%	333.93		3.81E-02	90.0%	3.43E-02
H.M.D.S. 100%, Bubbler	Wafer Coating	0.0	1500.0	grams				3.31	0.00	0.00	hexamethyldisilazane	999-97-3	100.0%	0.00		0.00E+00	90.0%	0.00E+00
H2SO4 EL-UM, Drums (Sulfuric Acid)	Wet Chemical Station	373.0	55.0	gal	55		10.77	592.21	220893.55	220893.55	Sulfuric acid	7664-93-9	96.0%	212057.81		2.42E+01	30.0%	7.26E+00
H3PO4 EL-UM, Drums (Phosphoric Acid)	Wet Chemical Station	26.0	660.0	lbs				660.00	17160.00	17160.00	Phosphoric acid	7664-38-2	86.0%	14757.60		1.68E+00	30.0%	5.05E-01
HCl EL-UM, Drums	Wet Chemical Station	30.0	506.0	lbs				506.00	15180.00	15180.00	Hydrochloric acid	7647-01-0	36.0%	5464.80		6.24E-01	30.0%	1.87E-01
HF 10:1 ppb Drums	Wet Chemical Station	0.0	484.0	lbs				484.00	0.00	0.00	Hydrofluoric acid	7664-39-3	49.0%	0.00		0.00E+00	30.0%	0.00E+00
HF 100:1 ppb Bottles	Wet Chemical Station	0.0	10.0	lbs				10.00	0.00	0.00	Hydrofluoric acid	7664-39-3	0.8%	0.00		0.00E+00	30.0%	0.00E+00
HF EL-UM, Drums	Wet Chemical Station	39.0	484.0	lbs				484.00	18876.00	18876.00	Hydrofluoric acid	7664-39-3	49.0%	9249.24		1.06E+00	30.0%	3.17E-01
HF ppb, Bottles	Wet Chemical Station	533.0	10.0	lbs				10.00	5330.00	5330.00	Hydrofluoric acid	7664-39-3	49.0%	2611.70		2.98E-01	30.0%	8.94E-02
Hydrochloric Acid, Bottle	Wet Chemical Station	263.0	10.0	lbs				10.00	2630.00	2630.00	Hydrochloric acid	7647-01-0	36.0%	946.80		1.08E-01	30.0%	3.24E-02
Hydrochloric Acid, Drum	Wet Chemical Station	0.0	506.0	lbs				506.00	0.00	0.00	Hydrochloric acid	7647-01-0	36.0%	0.00		0.00E+00	30.0%	0.00E+00
Hydrofluoric Acid, Bottle	Wet Chemical Station	0.0	10.0	lbs				10.00	0.00	0.00	Hydrofluoric acid	7664-39-3	49.0%	0.00		0.00E+00	30.0%	0.00E+00
Hydrofluoric Acid, ppb, Drum	Wet Chemical Station	0.0	484.0	lbs				484.00	0.00	0.00	Hydrofluoric acid	7664-39-3	49.0%	0.00		0.00E+00	30.0%	0.00E+00
Hydrogen Chloride, SEMI	Wet Chemical Station	8.0	55.0	lbs				55.00	440.00	440.00	Hydrochloric acid	7647-01-0	100.0%	440.00		5.02E-02	30.0%	1.51E-02
Hydrogen Peroxide, Bottle	Wet Chemical Station	536.0	10.0	lbs				10.00	5360.00	5360.00	Hydrogen Peroxide	7722-84-1	35.0%	1876.00		2.14E-01	30.0%	6.42E-02
Hydrogen Peroxide, Tank	Wet Chemical Station	44.0	2317.0	lbs				2317.00	101948.00	101948.00	Hydrogen Peroxide	7722-84-1	35.0%	35681.80		4.07E+00	30.0%	1.22E+00
Hydrogen Bromide	Wafer Etchant (TD assume 90% EF)	1.0	120	lbs				120.00	120.00	120.00	Hydrogen Bromide	10035-10-6	100.0%	120.0		1.37E-02	90.0%	1.23E-02
IPA EL-UM, Drums	Solvent Stations	0.0	330.0	lbs				330.00	0.00	0.00	Isopropanol	67-63-0	100.0%	0.00	94%	0.00E+00	30.0%	0.00E+00
Isopropyl Alcohol SV-IPA	Wipe Cleaning	0.0	7.7	lbs				7.67	0.00	0.00	Isopropanol	67-63-0	100.0%	0.00	94%	0.00E+00	100.0%	0.00E+00
Isopropyl Alcohol, 10 PPB	Wipe Cleaning	203.0	350.0	lbs				350.00	71050.00	71050.00	Isopropanol	67-63-0	100.0%	71050.00	94%	5.20E-01	100.0%	5.20E-01
Isopropyl Alcohol, Drum	Wipe Cleaning	0.0	330.0	lbs				330.00	0.00	0.00	Isopropanol	67-63-0	100.0%	0.00	94%	0.00E+00	100.0%	0.00E+00
LDD-26-W Microposit Developer	Solvent Stations	0.0	440.0	lbs				440.00	0.00	0.00	Tetramethyl ammonium hydroxide	75-59-2	2.4%	0.00		0.00E+00	30.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating	0.0	22.0	lbs				22.00	0.00	0.00	Diazo Photoactive Compound	NA	10.0%	0.00		0.00E+00	90.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating									0.00	n-Butyl acetate	123-86-4	5.0%	0.00	5%	0.00E+00	90.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating									0.00	Cresol	1319-77-3	1.0%	0.00		0.00E+00	90.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating									0.00	Cresol Novolak Resin	NA	30.0%	0.00		0.00E+00	90.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating									0.00	Ethyl Lactate	97-64-3	86.0%	0.00	94%	0.00E+00	90.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating									0.00	Xylene	1330-20-7	5.0%	0.00		0.00E+00	90.0%	0.00E+00
Megaposit SPR 518 L-A Photoresist	Wafer Coating									0.00	Organic Siloxane Surfactant	NA	1.0%	0.00		0.00E+00	90.0%	0.00E+00
NF3 ULSI, DISS	Wafer Etchant (TD assume 90% EF)	5.0	44.0	lbs				44.00	220.00	220.00	Nitrogen Trifluoride	7783-54-2	100.0%	220.00		2.51E-02	90.0%	2.26E-02
NH4OH EL-UM, Drums	Wet Chemical Station	0.0	375.0	lbs				375.00	0.00	0.00	Ammonium hydroxide	1336-21-6	29.0%	0.00		0.00E+00	30.0%	0.00E+00
Nitric Acid, Bottle	Wet Chemical Station	360.0	7.0	lbs				7.00	2520.00	2520.00	Nitric Acid	7697-37-2	69.5%	1751.40		2.00E-01	30.0%	6.00E-02
Nitric Oxide	Wafer Etchant (TD assume 90% EF)	3.0	56.0	cu ft.				4.360	13.08	13.08	Nitric oxide	10102-43-9	100.0%	13.08		1.49E-03	90.0%	1.34E-03
Nitrogen Trifluoride	Wafer Etchant (TD assume 90% EF)	0.0	44.0	lbs				44.00	0.00	0.00	Nitrogen trifluoride	7783-54-2	100.0%	0.00		0.00E+00	90.0%	0.00E+00
Nitrous Oxide	Wafer Etchant (TD assume 90% EF)	5.0	60.0	lbs				60.00	300.00	300.00	Nitrous oxide	10024-97-2	100.0%	300.00		3.42E-02	90.0%	3.08E-02
N-Methyl Pyrrolidinone (NMP), Bottles	Wafer Coating	28.0	9.0	lbs				9.00	252.00	252.00	N-Methyl Pyrrolidinone	872-50-4	100.0%	252.00		2.88E-02	90.0%	2.59E-02
PGMEA 100%	Wafer Coating	0.0	8.0	lbs				8.00	0.00	0.00	1-Methoxy-2-propanol	107-98-2	98.0%	0.00	0%	0.00E+00	90.0%	0.00E+00
Phosphine 100% (SA)	Electrochemically Destroyed (90% EF)	1.0	85.0	grams				0.19	0.19	0.19	Phosphine	7803-51-2	100.0%	0.19		2.14E-05	90.0%	1.93E-05
Phosphine 30% Bal Hydrogen 124lit	Wafer Coating	22.0	124.0	liters				0.386	8.50	8.50	Phosphine	7803-51-2	30.0%	2.55		2.91E-04	90.0%	2.62E-04
Phosphoric Acid, Bottle	Wet Chemical Station	8.0	14.0	lbs				14.00	112.00	112.00	Phosphoric acid	7664-38-2	86.0%	96.32		1.10E-02	30.0%	3.30E-03
Phosphoric Acid, Drum	Wet Chemical Station	0.0	660.0	lbs				660.00	0.00	0.00	Phosphoric acid	7664-38-2	86.0%	0.00		0.00E+00	30.0%	0.00E+00
POCL3 2466 GM	Wafer Coating	10.0	2466.0	grams				5.44	54.38	54.38	Phosphorus oxychloride	10025-87-3	100.0%	54.38		6.21E-03	90.0%	5.59E-03
Polyimide 115A	Wafer Coating	19.0	1.0	lbs				1.00	19.00	19.00	n-methyl-2-pyrrolidone	872-50-4	95.0%	18.05		2.06E-03	90.0%	1.85E-03
Polyimide 115A	Wafer Coating									19.00	polyamic acid	25038-81-7	20.0%	3.80		4.34E-04	90.0%	3.90E-04
RER 550	Wafer Coating	41.0	422.0	lbs				422.00	17302.00	17302.00	2-pentanone	107-87-9	60.0%	10381.20	100%	0.00E+00	90.0%	0.00E+00
RER 550	Wafer Coating									17302.00	ethyl lactate	97-64-3	60.0%	10381.20	94%	7.59E-02	90.0%	6.83E-02
RER 550	Wafer Coating									17302.00	4-methyl-2-Pentanone	108-10-1	3.0%	519.06		5.93E-02	90.0%	5.33E-02
Silane 100%	Wafer Coating	8.0	12.0	kg				26.46	211.64	211.64	Silicon tetrahydride	7803-62-5	100.0%	211.64		2.42E-02	90.0%	2.17E-02
Silane ULSI	Wafer Coating	0.0	12.0	kg				26.46	0.00	0.00	Silicon tetrahydride	7803-62-5	100.0%	0.00		0.00E+00	90.0%	0.00E+00
Megaposit SPR 3012 Resist	Wafer Coating	59.0	9.0	lbs				9.00	531.00	531.00	anisole	100-66-3	9.5%	50.45	5%	5.49E-03	90.0%	4.94E-03
Megaposit SPR 3012 Resist	Wafer Coating									531.00	cresol	1319-77-3	1.0%	5.31		6.06E-04	90.0%	5.46E-04
Megaposit SPR 3012 Resist	Wafer Coating									531.00	ethyl lactate	97-64-3	60.0%	318.60	94%	2.33E-03	90.0%	2.10E-03
Megaposit SPR 3012 Resist	Wafer Coating									531.00	Cresol Novolak	NA	25.0%	132.75		1.52E-02	90.0%	1.36E-02
Megaposit SPR 3012 Resist	Wafer Coating									531.00	2-Methyl butyl acetate	624-41-9	3.0%	15.93		1.82E-03	90.0%	1.64E-03
Megaposit SPR 3012 Resist	Wafer Coating									531.00	n-amyl acetate	628-63-7	3.0%	15.93		1.82E-03	90.0%	1.64E-03
Megaposit SPR 3012 Resist	Wafer Coating									531.00	Diazo photactive compound	NA	5.5%	29.21		3.33E-03	90.0%	3.00E-03
Megaposit SPR 3012 Resist	Wafer Coating									531.00	Organic Siloxane Surfactant	NA	1.0%	5.31		6.06E-04	90.0%	5.46E-04

ON Semiconductors, Pocatello, ID

Facility Emissions

Constituents [1]	CAS Number	VOC[2]	HAP	TAP	State	Uncontrolled Emission Rate with Emission Factors (lb/hr)	Control Device	Controlled Emission Rate (lb/hr)	Baseline Emission Rate (lb/hr)	VOC Baseline (lb/hr)	HAP Baseline (lb/hr)	TAP Baseline (lb/hr)	On-line Rating (hrs)	HAP Baseline (ton/yr)	PM_{10} Baseline (lb/hr)
						A	B	C = IF(B>0,A*(1-B),"-")	D = IF(C="-",A,C)	E = IF(VOC="yes",D,"NA")	F = IF(HAP="yes",D,"NA")	G = IF(TAP="yes",D,"NA")		IF(TAP="yes",D/2000*(hrs/yr),"NA")	H = IF(State="S",D,"NA")
Acetylene	74-86-2	yes	no	no	G	0.005		-	4.63E-03	4.6E-03	NA	NA	8760	NA	NA
Ammonia	7664-41-7	no	no	yes	L	1.922	90%	1.92E-01	1.92E-01	NA	NA	1.92E-01	8760	NA	NA
Bromine Chloride	13863-41-7	no	no	no	L	0.003		-	2.79E-03	NA	NA	NA	8760	NA	NA
Calcium Carbonate	471-34-1	no	no	no	S	1.786	90%	1.79E-01	1.79E-01	NA	NA	NA	75	NA	1.8E-01
Calcium Hydroxide	1305-62-0	no	no	yes	S	0.029		-	2.91E-02	NA	NA	2.91E-02	4	NA	2.9E-02
Ethlyene glycol	107-21-1	yes	yes	yes	L	0.000		-	0.00E+00	0.0E+00	0.0E+00	0.00E+00	8760	0.00E+00	NA
Isoparaffinic Petroleum Distillate	64742-47-8	no	no	no	L	0.070	90%	7.04E-03	7.04E-03	NA	NA	NA	75	NA	NA
Lithium Carbonate	554-13-2	no	no	no	S	0.002	90%	2.31E-04	2.31E-04	NA	NA	NA	52	NA	2.3E-04
Lithium Chlorate	36355-96-1	no	no	no	S	0.002	90%	2.31E-04	2.31E-04	NA	NA	NA	52	NA	2.3E-04
Lithium Chloride	7447-41-8	no	no	no	S	0.005	90%	4.62E-04	4.62E-04	NA	NA	NA	52	NA	4.6E-04
Lithium Hydroxide	1310-65-2	no	no	no	S	0.001	90%	1.15E-04	1.15E-04	NA	NA	NA	52	NA	1.2E-04
Lithium Hypochlorite	13840-33-0	no	no	no	S	0.033	90%	3.35E-03	3.35E-03	NA	NA	NA	52	NA	3.3E-03
Magnesium Hydroxide	546-93-0	no	no	yes	S	0.065		-	6.51E-02	NA	NA	6.51E-02	75	NA	6.5E-02
Methacrylic Acid	54193-.36-1	no	no	no	L	0.000		-	2.77E-04	NA	NA	NA	8760	NA	NA
Perfluoroalkylether	60164-51-4	yes	no	no	L	0.017		-	1.65E-02	1.7E-02	NA	NA	8760	NA	NA
Potassium Sulfate	7646-93-7	no	no	no	S	0.007	90%	6.92E-04	6.92E-04	NA	NA	NA	52	NA	6.9E-04
Silicon Dioxide	14808-60-7	no	no	yes	S	0.009		-	9.30E-03	NA	NA	9.30E-03	75	NA	9.3E-03
Soda Ash Flux	68855-54-9	no	no	no	S	0.493	90%	4.93E-02	4.93E-02	NA	NA	NA	75	NA	4.9E-02
Sodium Hydoxide	1310-73-2	no	no	yes	L & S	0.005		-	5.04E-03	NA	NA	5.04E-03	8760	NA	NA
Sodium Metabisulfite	7681-57-4	no	no	yes	S	0.001		-	6.85E-04	NA	NA	6.85E-04	8760	NA	6.8E-04
Sodium Polyacrylate	9003-04-7	no	no	no	L	0.000		-	1.71E-04	NA	NA	NA	8760	NA	NA
Sodium Sulfite	7757-83-7	no	no	no	L	0.001		-	1.19E-03	NA	NA	NA	8760	NA	NA
Sodium Sulfate	7757-82-6	no	no	no	S	0.015	90%	1.50E-03	1.50E-03	NA	NA	NA	52	NA	1.5E-03

[1] Information was supplied by ON Semiconductor, Inc
[2] Volatile Organic Compound is defined under 40 CFR 51.100 (s). Chemicals that could not be verified as either VOC or non-VOC are assumed to be VOC. "NA" implies that the pollutant is not regulated as a VOC.

Facility Emissions Summary						
Baseline						
Facility total from mass balance (lb/hr) (excluding LS)	0.021	0.000	0.198			0.057
Lime Silo total from mass balance (lb/hr)	0.000	0.000	0.103			0.282
Total (lb/hr)	**0.021**	**0.000**	**0.301**			**0.339**
Facility total from mass balance (tpy) (excluding LS)	0.093	0.000	0.867			0.248
Lime Silo total from mass balance (tpy)	0.000	0.000	0.453			1.235
Total (tpy)	**0.093**	**0.000**	**1.320**			**1.483**
Annual FEC Calculation						
Facility Operational Variability (tpy)	0.074	0.000	NA			0.198
Lime Silo Operational Variability (tpy)	0.000	0.000	NA			0.985
Facility Proposed Growth (tpy)	0.033	0.000	NA			0.089
Lime Silo Proposed Growth (tpy)	0.000	0.000	NA			0.444
Facility Total (tpy)	0.107	0.000	NA			0.287
Lime Silo (tpy)	0.000	0.000	NA			1.429
Total Annual (tpy)	**0.200**	**0.000**	**1.320**			**3.199**

HAP Summary

ON Semiconductors, Pocatello, ID

HAP Summary

									A	B	C	D	E	F = ∑A +B+C+D+E	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
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)**	**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)**
Arsenic	7440-38-2	Yes	Boiler				yes					1.60E-05		1.60E-05				7.00E-05		7.00E-05	NA	NA	4.92E-06	2.16E-05	2.09E-05	9.15E-05
Cadmium	7440-43-9	Yes	Boiler				yes					8.79E-05		8.79E-05				3.85E-04		3.85E-04	NA	NA	2.71E-05	1.19E-04	1.15E-04	5.03E-04
Chromium	7440-47-3	Yes	Boiler				yes					1.12E-04		1.12E-04				4.90E-04		4.90E-04	NA	NA	3.45E-05	1.51E-04	1.46E-04	6.41E-04
Cobalt	7440-48-4	Yes	Boiler				yes					6.71E-06		6.71E-06				2.94E-05		2.94E-05	NA	NA	2.07E-06	9.06E-06	8.78E-06	3.84E-05
Hexane	110-54-3	Yes	Boiler				yes					1.44E-01		1.44E-01				6.30E-01		6.30E-01	NA	NA	4.43E-02	1.94E-01	1.88E-01	8.24E-01
Manganese	7439-96-5	Yes	Boiler				yes					3.04E-05		3.04E-05				1.33E-04		1.33E-04	NA	NA	9.35E-06	4.10E-05	3.97E-05	1.74E-04
Mercury	7439-97-6	Yes	Boiler				yes					2.08E-05		2.08E-05				9.10E-05		9.10E-05	NA	NA	6.40E-06	2.80E-05	2.72E-05	1.19E-04
Nickel	7440-02-0	Yes	Boiler				yes					1.68E-04		1.68E-04				7.35E-04		7.35E-04	NA	NA	5.17E-05	2.26E-04	2.19E-04	9.61E-04
Benzene	71-43-2	Yes	Boiler & EG				yes	yes				1.68E-04	1.96E-02	1.98E-02				7.35E-04	9.80E-04	1.71E-03	NA	NA	5.17E-05	2.26E-04	1.98E-02	1.94E-03
Benzo(a)pyren	50-32-8	Yes	Boiler & EG				yes	yes				9.59E-08	5.38E-06	5.48E-06				4.20E-07	2.69E-07	6.89E-07	NA	NA	2.95E-08	1.29E-07	5.51E-06	8.18E-07
Formaldehyde	50-00-0	Yes	Boiler & EG				yes	yes				5.99E-03	4.49E-02	5.09E-02				2.62E-02	2.25E-03	2.85E-02	NA	NA	1.85E-03	8.09E-03	5.28E-02	3.66E-02
Naphthalene	91-20-3	Yes	Boiler & EG				yes	yes				4.87E-05	2.93E-03	2.98E-03				2.13E-04	1.46E-04	3.60E-04	NA	NA	1.50E-05	6.58E-05	2.99E-03	4.26E-04
Toluene	108-88-3	Yes	Boiler & EG				yes	yes				2.72E-04	7.07E-03	7.34E-03				1.19E-03	3.53E-04	1.54E-03	NA	NA	8.37E-05	3.67E-04	7.42E-03	1.91E-03
1,1,2,2-Tetrachloroethane	79-34-5	Yes	EG					yes					5.34E-05	5.34E-05					2.67E-06	2.67E-06	NA	NA	NA	NA	5.34E-05	2.67E-06
1,1,2-Trichloroethane	79-00-5	Yes	EG					yes					3.23E-05	3.23E-05					1.62E-06	1.62E-06	NA	NA	NA	NA	3.23E-05	1.62E-06
1,1-Dichloroethane	75-34-3	Yes	EG					yes					2.39E-05	2.39E-05					1.19E-06	1.19E-06	NA	NA	NA	NA	2.39E-05	1.19E-06
1,2-Dichloropropane	78-87-5	Yes	EG					yes					2.74E-05	2.74E-05					1.37E-06	1.37E-06	NA	NA	NA	NA	2.74E-05	1.37E-06
1,3-Butadiene	106-99-0	Yes	EG					yes					1.40E-03	1.40E-03					7.00E-05	7.00E-05	NA	NA	NA	NA	1.40E-03	7.00E-05
1,3-Dichloropropene	542-75-6	Yes	EG					yes					2.68E-05	2.68E-05					1.34E-06	1.34E-06	NA	NA	NA	NA	2.68E-05	1.34E-06
1,2-Dichloroethane	107-06-2	Yes	EG					yes					2.39E-05	2.39E-05					1.19E-06	1.19E-06	NA	NA	NA	NA	2.39E-05	1.19E-06
Acetaldehyde	75-07-0	Yes	EG					yes					6.42E-03	6.42E-03					3.21E-04	3.21E-04	NA	NA	NA	NA	6.42E-03	3.21E-04
Acrolein	107-02-8	Yes	EG					yes					5.72E-03	5.72E-03					2.86E-04	2.86E-04	NA	NA	NA	NA	5.72E-03	2.86E-04
Carbon Tetrachloride	56-23-5	Yes	EG					yes					3.74E-05	3.74E-05					1.87E-06	1.87E-06	NA	NA	NA	NA	3.74E-05	1.87E-06
Chlorobenzene	108-90-7	Yes	EG					yes					2.72E-05	2.72E-05					1.36E-06	1.36E-06	NA	NA	NA	NA	2.72E-05	1.36E-06
Ethylene Dibromide	106-93-4	Yes	EG					yes					5.24E-05	5.24E-05					2.62E-06	2.62E-06	NA	NA	NA	NA	5.24E-05	2.62E-06
Methanol	67-56-1	Yes	EG					yes					6.46E-03	6.46E-03					3.23E-04	3.23E-04	NA	NA	NA	NA	6.46E-03	3.23E-04
Methylene Chloride	75-09-2	Yes	EG					yes					8.70E-05	8.70E-05					4.35E-06	4.35E-06	NA	NA	NA	NA	8.70E-05	4.35E-06
PAHs	NA	Yes	EG					yes					2.01E-03	2.01E-03	NA	NA			1.01E-04	1.01E-04	NA	NA	NA	NA	2.01E-03	1.01E-04
Styrene	100-42-5	Yes	EG					yes					2.51E-05	2.51E-05					1.26E-06	1.26E-06	NA	NA	NA	NA	2.51E-05	1.26E-06
Vinyl Chloride	75-01-4	Yes	EG					yes					1.52E-05	1.52E-05					7.58E-07	7.58E-07	NA	NA	NA	NA	1.52E-05	7.58E-07
xylene	1330-20-7	Yes	EG & Facility	yes				yes	0.00E+00				4.46E-03	4.46E-03	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
4-methyl 2-pentanone	108-10-1	Yes	Facility	yes	yes				5.33E-02	1.76E-01				2.29E-01	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
Arsine	7784-42-1	Yes	Facility	yes	yes				4.36E-04	3.62E-04				7.99E-04	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
Catechol	120-80-9	Yes	Facility		yes					4.34E-02				4.34E-02		1.90E-01				1.90E-01	3.46E-02	1.51E-01	1.56E-02	6.83E-02	9.36E-02	4.10E-01
Chlorine	7782-50-5	Yes	Facility	yes	yes				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
Chloroform	66-67-3	Yes	Facility	yes					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
Cresol	1319-77-3	Yes	Facility	yes	yes				9.09E-04	1.48E-04				1.06E-03	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
Ethlyene glycol	107-21-1	Yes	Facility			yes					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
Hydrofluoric acid	7664-39-3	Yes	Facility	yes	yes				1.07E-01	1.47E-01				2.54E-01	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
Hydrogen Chloride	7647-01-0	Yes	Facility	yes	yes				3.74E-02	2.77E-02				6.52E-02	1.64E-01	1.21E-01				2.85E-01	5.19E-02	2.28E-01	2.34E-02	1.03E-01	1.41E-01	6.16E-01
Phosphine	7803-51-2	Yes	Facility	yes	yes				2.81E-04	3.85E-04				6.66E-04	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
propylene glycol monoethyl ether acetate	108-65-6	Yes	Facility	yes	yes				2.36E-02	0.00E+00				2.36E-02	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
propylene glycol monomethyl ether	107-98-2	Yes	Facility	yes	yes				0.00E+00	2.83E-02				2.83E-02	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
Total		**Yes**							**0.22**	**0.42**	**0.00**	**0.15**	**0.10**	**0.90**	**0.98**	**1.85**	**0.00**	**0.66**	**0.01**	**3.49**	**0.51**	**2.25**	**0.28**	**1.22**	**1.69**	**6.97**

TAPs

Combustion Equipment TAPs Summary

Pollutants	CAS #	Source	Averaging Period	ABOI	BBOIHWB	BBOIST	CBOIHWB	DBOIHWB	DBOIST1	GBOIHWE	GBOISB1	GBOISB2	GBOISB3	BEMGEN		CEMGENR		CEMGENS		DEMGEN		DMREMGEN		GEEMGEN		GOEMGEN		Total	Total	IDAPA 585 or 586 TAP	OEL or UR	EL	AAC	AACC	PTE Over EL	PTE % of EL
				24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr and Annual Avg	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.	24-hr Avg.	Annual Avg.								
				lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		(mg/m³)	(lb/hr)	(mg/m³)	(µg/m³)		
1,1-Dichloroethane	75-34-3	EG	24-hr											1.22E-07	3.36E-08	1.22E-07	3.36E-08	0.00E+00	0.00E+00	2.88E-07	7.89E-08	4.61E-07	1.26E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.94E-07	NA	Yes	4.05E+02	2.70E+01	2.03E+01		no	0%
Chlorobenzene	108-90-7	EG	24-hr											1.40E-07	3.83E-08	1.40E-07	3.83E-08	0.00E+00	0.00E+00	3.29E-07	9.01E-08	5.26E-07	1.44E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-06	NA	Yes	3.50E+02	2.33E+01	1.75E+01		no	0%
1,2-Dichloropropane	78-87-5	EG	24-hr											1.41E-07	3.86E-08	1.41E-07	3.86E-08	0.00E+00	0.00E+00	3.32E-07	9.08E-08	5.30E-07	1.45E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-06	NA	Yes	3.47E+02	2.31E+01	1.74E+01		no	0%
Styrene	100-42-5	EG	24-hr											1.29E-07	3.53E-08	1.29E-07	3.53E-08	0.00E+00	0.00E+00	3.03E-07	8.31E-08	4.86E-07	1.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-06	NA	Yes	--	6.67E+00	1.00E+00		no	0%
1,2-Dichloroethane	107-06-2	EG	24-hr											1.22E-07	3.36E-08	1.22E-07	3.36E-08	0.00E+00	0.00E+00	2.88E-07	7.89E-08	4.61E-07	1.26E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.94E-07	NA	Yes	4.00E+01	2.67E+00	2.00E+00		no	0%
Xylene	1330-20-7	EG	24-hr											2.11E-06	5.79E-07	2.11E-06	5.79E-07	5.06E-05	1.39E-05	4.97E-06	1.36E-06	7.96E-06	2.18E-06	4.82E-05	1.32E-05	6.97E-05	1.91E-05	1.86E-04	NA	Yes	4.35E+02	2.90E+01	2.18E+01		no	0%
Methanol	67-56-1	EG	24-hr											3.32E-05	9.09E-06	3.32E-05	9.09E-06	0.00E+00	0.00E+00	7.80E-05	2.14E-05	1.25E-04	3.42E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E-04	NA	Yes	2.60E+02	1.73E+01	1.30E+01		no	0%
Toluene	108-88-3	Boiler & EG	24-hr	2.98E-06	2.93E-05	2.56E-05	2.93E-05	2.93E-05	1.83E-05	5.02E-06	7.18E-05	7.18E-05	7.18E-05	6.05E-06	1.66E-06	6.05E-06	1.66E-06	7.36E-05	2.02E-05	1.42E-05	3.90E-06	2.28E-05	6.24E-06	7.02E-05	1.92E-05	1.01E-04	2.78E-05	6.50E-04	NA	Yes	3.75E+02	2.50E+01	1.88E+01		no	0%
Naphthalene	91-20-3	Boiler & EG	24-hr	5.34E-07	5.26E-06	4.60E-06	5.26E-06	5.26E-06	3.28E-06	9.01E-07	1.29E-05	1.29E-05	1.29E-05	1.05E-06	2.88E-07	1.05E-06	2.88E-07	3.41E-05	9.33E-06	2.48E-06	6.78E-07	3.96E-06	1.09E-06	3.25E-05	8.90E-06	4.69E-05	1.29E-05	1.86E-04	NA	Yes	5.00E+01	3.33E+00	2.50E+00		no	0%
Molybdenum	7439-98-7	Boiler	24-hr	9.63E-07	9.48E-06	8.29E-06	9.48E-06	9.48E-06	5.92E-06	1.62E-06	2.32E-05	2.32E-05	2.32E-05															1.15E-04	NA	Yes	1.00E+01	6.67E-01	5.00E-01		no	0%
Manganese	7439-96-5	Boiler	24-hr	3.33E-07	3.27E-06	2.86E-06	3.27E-06	3.27E-06	2.05E-06	5.61E-07	8.03E-06	8.03E-06	8.03E-06															3.97E-05	NA	Yes	1.00E+00	6.70E-02	5.00E-02		no	0%
Pentane	109-66-0	Boiler	24-hr	2.28E-03	2.24E-02	1.96E-02	2.24E-02	2.24E-02	1.40E-02	3.84E-03	5.49E-02	5.49E-02	5.49E-02															2.72E-01	NA	Yes	1.77E+03	1.18E+02	8.85E+01		no	0%
Cobalt	7440-48-4	Boiler	24-hr	7.35E-08	7.24E-07	6.33E-07	7.24E-07	7.24E-07	4.52E-07	1.24E-07	1.77E-06	1.77E-06	1.77E-06															8.78E-06	NA	Yes	5.00E-02	3.30E-03	2.50E-03		no	0%
Chromium	7440-47-3	Boiler	24-hr	1.23E-06	1.21E-05	1.06E-05	1.21E-05	1.21E-05	7.54E-06	2.07E-06	2.96E-05	2.96E-05	2.96E-05															1.46E-04	NA	Yes	5.00E-01	3.30E-02	2.50E-02		no	0%
Zinc	7440-66-6	Boiler	24-hr	2.54E-05	2.50E-04	2.19E-04	2.50E-04	2.50E-04	1.56E-04	4.28E-05	6.13E-04	6.13E-04	6.13E-04															3.03E-03	NA	Yes	--	6.67E-01	5.00E-01		no	0%
Copper	7440-50-8	Boiler	24-hr	7.44E-07	7.32E-06	6.41E-06	7.32E-06	7.32E-06	4.56E-06	1.26E-06	1.80E-05	1.80E-05	1.80E-05															8.88E-05	NA	Yes	2.00E-01	1.30E-02	1.00E-02		no	1%
Mercury	7439-97-6	Boiler	24-hr	2.28E-07	2.24E-06	1.96E-06	2.24E-06	2.24E-06	1.40E-06	3.84E-07	5.49E-06	5.49E-06	5.49E-06															2.72E-05	NA	Yes	5.00E-02	3.00E-03	2.50E-03		no	1%
Barium	7440-39-3	Boiler	24-hr	3.85E-06	3.79E-05	3.32E-05	3.79E-05	3.79E-05	2.37E-05	6.50E-06	9.30E-05	9.30E-05	9.30E-05															4.60E-04	NA	Yes	5.00E-01	3.30E-02	2.50E-02		no	1%
Acrolein	107-02-8	EG	24-hr											2.85E-05	7.81E-06	2.85E-05	7.81E-06	2.07E-06	5.66E-07	6.71E-05	1.84E-05	1.07E-04	2.94E-05	1.97E-06	5.39E-07	2.84E-06	7.79E-07	2.38E-04	NA	Yes	2.50E-01	1.70E-02	1.25E-02		no	1%
Hexane	110-54-3	Boiler	24-hr	1.58E-03	1.55E-02	1.36E-02	1.55E-02	1.55E-02	9.69E-03	2.66E-03	3.80E-02	3.80E-02	3.80E-02															1.88E-01	NA	Yes	1.80E+02	1.20E+01	9.00E+00		no	2%
Vinyl Chloride	75-01-4	EG	Annual											7.78E-08	2.13E-08	7.78E-08	2.13E-08	0.00E+00	0.00E+00	1.83E-07	5.02E-08	2.93E-07	8.03E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	1.73E-07	Yes	7.10E-06	9.40E-04		1.40E-01	no	0%
Methylene Chloride	75-09-2	EG	Annual											4.47E-07	1.22E-07	4.47E-07	1.22E-07	0.00E+00	0.00E+00	1.05E-06	2.88E-07	1.68E-06	4.61E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	9.93E-07	Yes	4.10E-06	1.60E-03		2.40E-01	no	0%
1,1,2-Trichloroethane	79-00-5	EG	Annual											1.66E-07	4.54E-08	1.66E-07	4.54E-08	0.00E+00	0.00E+00	3.90E-07	1.07E-07	6.24E-07	1.71E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	3.69E-07	Yes	1.60E-05	4.20E-04		6.20E-02	no	0%
Carbon Tetrachloride	56-23-5	EG	Annual											1.92E-07	5.26E-08	1.92E-07	5.26E-08	0.00E+00	0.00E+00	4.51E-07	1.24E-07	7.22E-07	1.98E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	4.27E-07	Yes	1.50E+05	4.40E-04		6.70E-02	no	0%
Chloroform	67-66-3	EG	Annual											1.48E-07	4.07E-08	1.48E-07	4.07E-08	0.00E+00	0.00E+00	3.49E-07	9.57E-08	5.59E-07	1.53E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	3.30E-07	Yes	2.30E-05	2.80E-04		4.30E-02	no	0%
Ethylene Dibromide	106-93-4	EG	Annual											2.69E-07	7.36E-08	2.69E-07	7.36E-08	0.00E+00	0.00E+00	6.32E-07	1.73E-07	1.01E-06	2.77E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	5.98E-07	Yes	2.20E-04	3.00E-05		4.50E-03	no	2%
Acetaldehyde	75-07-0	EG	Annual											3.02E-05	8.28E-06	3.02E-05	8.28E-06	6.60E-06	1.81E-06	7.11E-05	1.95E-05	1.14E-04	3.12E-05	6.30E-06	1.72E-06	9.10E-06	2.49E-06	NA	7.33E-05	Yes	2.20E-06	3.00E-03		4.50E-01	no	2%
1,1,2,2-Tetrachloroethane	79-34-5	EG	Annual											2.74E-07	7.51E-08	2.74E-07	7.51E-08	0.00E+00	0.00E+00	6.45E-07	1.77E-07	1.03E-06	2.83E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	6.10E-07	Yes	5.80E-05	1.10E-05		1.70E-02	no	6%
Benzo(a)pyrene	50-32-8	Boiler	Annual	1.05E-09	1.03E-08	9.05E-09	1.03E-08	1.03E-08	6.46E-09	1.77E-09	2.54E-08	2.54E-08	2.54E-08															NA	1.25E-07	Yes	3.30E-03	2.00E-06		3.00E-04	no	6%
3-Methylcholanthrene	56-49-5	Boiler	Annual	1.58E-09	1.55E-08	1.36E-08	1.55E-08	1.55E-08	9.69E-09	2.66E-09	3.80E-08	3.80E-08	3.80E-08															NA	1.88E-07	Yes	2.70E-03	2.50E-06		3.70E-04	no	8%
PAHs	NA	EG	Annual											1.53E-06	4.19E-07	1.53E-06	4.19E-07	2.14E-05	5.87E-06	3.60E-06	9.85E-07	5.75E-06	1.58E-06	2.04E-05	5.59E-06	2.95E-05	8.09E-06	NA	2.29E-05	Yes	7.30E-05	9.10E-05		1.40E-02	no	25%
Benzene	71-43-2	Boiler & EG	Annual	1.84E-06	1.81E-05	1.58E-05	1.81E-05	1.81E-05	1.13E-05	3.10E-06	4.44E-05	4.44E-05	4.44E-05	1.71E-05	4.69E-06	1.71E-05	4.69E-06	2.03E-04	5.57E-05	4.03E-05	1.10E-05	6.45E-05	1.77E-05	1.94E-04	5.31E-05	2.80E-04	7.68E-05	NA	4.43E-04	Yes	8.30E-06	8.00E-04		1.20E-01	no	55%
1,3-Butadiene	106-99-0	EG	Annual											7.19E-06	1.97E-06	7.19E-06	1.97E-06	0.00E+00	0.00E+00	1.69E-05	4.63E-06	2.71E-05	7.41E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	1.60E-05	Yes	2.80E-04	2.40E-05		3.60E-03	no	67%
1,3-Dichloropropene	542-75-6	EG	Annual											1.38E-07	3.77E-08	1.38E-07	3.77E-08	0.00E+00	0.00E+00	3.24E-07	8.87E-08	5.18E-07	1.42E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	3.06E-07	Yes	3.50E-01	1.90E-07		2.90E-06	yes	161%
Nickel	7440-02-0	Boiler	Annual	1.84E-06	1.81E-05	1.58E-05	1.81E-05	1.81E-05	1.13E-05	3.10E-06	4.44E-05	4.44E-05	4.44E-05															NA	2.19E-04	Yes	2.40E-04	2.70E-05		4.20E-03	yes	813%
Arsenic	7440-38-2	Boiler	Annual	1.75E-07	1.72E-06	1.51E-06	1.72E-06	1.72E-06	1.08E-06	2.95E-07	4.23E-06	4.23E-06	4.23E-06															NA	2.09E-05	Yes	4.30E-03	1.50E-06		2.30E-04	yes	1393%
Formaldehyde	50-00-0	Boiler & EG	Annual	6.56E-05	6.46E-04	5.65E-04	6.46E-04	6.46E-04	4.04E-04	1.11E-04	1.58E-03	1.58E-03	1.58E-03	2.22E-04	6.09E-05	2.22E-04	6.09E-05	2.07E-05	5.66E-06	5.23E-04	1.43E-04	8.36E-04	2.29E-04	1.97E-05	5.40E-06	2.85E-05	7.80E-06	NA	8.35E-03	Yes	1.30E-05	5.10E-04		7.70E-02	yes	1637%
Cadmium	7440-43-9	Boiler	Annual	9.63E-07	9.48E-06	8.29E-06	9.48E-06	9.48E-06	5.92E-06	1.62E-06	2.32E-05	2.32E-05	2.32E-05															NA	1.15E-04	Yes	1.80E-03	3.70E-06		5.60E-04	yes	3107%

Note: Includes emission increases for proposed growth component

Process TAP Summary And Evaluation

			A	B	C		D = A+B+C	E = 1.797*D-D	F = D+E										G	H = F * G				
Toxic Air Pollutants	CAS #	IDAPA 585 or 586 TAP	Fab 9 (lb/hr)	Fab 10 (lb/hr)	Facility (lb/hr)	Source	Total Baseline (lb/hr)	Projected Growth (lb/hr)	PTE (lb/hr)	Averaging Time	OEL or UR (mg/m^3)	EL (lb/hr)	AAC (mg/m^3)	AACC $(ug/m^3)^5$	Baseline Over EL	Baseline % of EL	PTE over EL	PTE % of EL	Chi/Q	Maximum Predicted Impact	% of AAC/AACC	AAC Trigger (lb/hr)	Is the AAC Trigger > Baseline?	AACC Trigger (lb/hr)
2-pentanone	107-87-9	Yes	0.00E+00	0.00E+00		Facility	0.00E+00	0.00E+00	0.00E+00	24-hr	7.00E+02	4.67E+01	3.50E+01		no	0%	no	0%	0.04	0.00E+00	0%	9.37E+02	No	NA
Chlorine	7782-50-5	Yes	0.00E+00	0.00E+00		Facility	0.00E+00	0.00E+00	0.00E+00	24-hr	3.00E+00	2.00E-01	1.50E-01		no	0%	no	0%	0.04	0.00E+00	0%	4.02E+00	No	NA
Ethlyene glycol	107-21-1	Yes			0.00E+00	Facility	0.00E+00	0.00E+00	0.00E+00	24-hr	127.00	0.85	6.35		no	0%	no	0%	0.04	0.00E+00	0%	1.70E+02	No	NA
Phosphorus oxychloride	10025-87-3	Yes	0.00E+00			Facility	0.00E+00	0.00E+00	0.00E+00	24-hr	6.00E-01	4.00E-02	3.00E-02		no	0%	no	0%	0.04	0.00E+00	0%	8.03E-01	No	NA
Xylene	1330-20-7	Yes	0.00E+00			Facility	0.00E+00	0.00E+00	0.00E+00	24-hr	4.35E+02	2.90E+01	2.18E+01		no	0%	no	0%	0.04	0.00E+00	0%	5.82E+02	No	NA
ethyl alcohol	64-17-5	Yes	9.89E-04	2.46E-03		Facility	3.45E-03	2.75E-03	6.20E-03	24-hr	1.88E+03	1.25E+02	9.40E+01		no	0%	no	0%	0.04	2.20E-04	0%	2.52E+03	No	NA
N-Amyl Acetate	628-63-7	Yes	1.64E-03	4.44E-04		Facility	2.08E-03	1.66E-03	3.74E-03	24-hr	5.30E+02	3.53E+01	2.65E+01		no	0%	no	0%	0.04	1.33E-04	0%	7.09E+02	No	NA
Boron trifloride	7637-07-2	Yes	7.14E-06	4.76E-06		Facility	1.19E-05	9.48E-06	2.14E-05	24-hr	3.00E+00	2.00E-01	2.50E-01		no	0%	no	0%	0.04	7.58E-07	0%	6.69E+00	No	NA
n-butyl alcohol	71-36-3	Yes	7.39E-04	1.05E-03		Facility	1.79E-03	1.43E-03	3.22E-03	24-hr	1.50E+02	1.00E+01	7.50E+00		no	0%	no	0%	0.04	1.14E-04	0%	2.01E+02	No	NA
n-butyl acetate	123-86-4	Yes	1.57E-03	1.34E-02		Facility	1.50E-02	1.20E-02	2.69E-02	24-hr	7.10E+02	4.73E+01	3.55E+01		no	0%	no	0%	0.04	9.56E-04	0%	9.50E+02	No	NA
Cresol	1319-77-3	Yes	9.09E-04	1.48E-04		Facility	1.06E-03	8.42E-04	1.90E-03	24-hr	2.20E+01	1.47E+00	1.10E+00		no	0%	no	0%	0.04	6.74E-05	0%	2.95E+01	No	NA
propylene glycol monomethyl ether acetate	108-65-6	Yes	2.36E-02	0.00E+00		Facility	2.36E-02	1.88E-02	4.24E-02	24-hr	NA	2.40E+01	3.60E+00		no	0%	no	0%	0.04	1.51E-03	0%	9.64E+01	No	NA
1-Methoxy-2-propanol	107-98-2	Yes	0.00E+00	2.83E-02		Facility	2.83E-02	2.26E-02	5.09E-02	24-hr	3.60E+02	2.40E+01	1.80E+01		no	0%	no	0%	0.04	1.81E-03	0%	4.82E+02	No	NA
Nitrogen Trifluoride	7783-54-2	Yes	2.26E-04	2.76E-03		Facility	2.98E-03	2.38E-03	5.36E-03	24-hr	2.90E+01	1.93E+00	1.45E+00		no	0%	no	0%	0.04	1.90E-04	0%	3.88E+01	No	NA
Potassium Hydroxide	1310-58-3	Yes		2.08E-04		Facility	2.08E-04	1.66E-04	3.75E-04	24-hr	2.00E+00	1.33E-01	1.00E-01		no	0%	no	0%	0.04	1.33E-05	0%	2.68E+00	No	NA
Sodium Metabisulfite	7681-57-4	Yes			6.85E-04	Facility	6.85E-04	5.46E-04	1.23E-03	24-hr	5.00E+00	3.33E-01	2.50E-01		no	0%	no	0%	0.04	4.37E-05	0%	6.69E+00	No	NA
Isopropanol	67-63-0	Yes	5.20E-01	4.22E-04		Facility	5.20E-01	4.15E-01	9.35E-01	24-hr	9.80E+02	6.53E+01	4.90E+01		no	1%	no	1%	0.04	3.32E-02	0%	1.31E+03	No	NA
Nitrous oxide	10024-97-2	Yes	3.08E-02	1.85E-02		Facility	4.93E-02	3.93E-02	8.86E-02	24-hr	9.00E+01	6.00E+00	4.50E+00		no	1%	no	1%	0.04	3.14E-03	0%	1.20E+02	No	NA
Acetone	67-64-1	Yes	6.71E-01	6.47E-01		Facility	1.32E+00	1.05E+00	2.37E+00	24-hr	1.78E+03	1.19E+02	8.90E+01		no	1%	no	2%	0.04	8.40E-02	0%	2.38E+03	No	NA
2-Heptanone	110-43-0	Yes	7.29E-02	1.77E-01		Facility	2.50E-01	1.99E-01	4.48E-01	24-hr	2.35E+02	1.57E+01	1.18E+01		no	2%	no	3%	0.04	1.59E-02	0%	3.15E+02	No	NA
4-methyl 2-pentanone	108-10-1	Yes	5.33E-02	1.76E-01		Facility	2.29E-01	1.82E-01	4.11E-01	24-hr	2.05E+02	1.37E+01	1.03E+01		no	2%	no	3%	0.04	1.46E-02	0%	2.74E+02	No	NA
Phosphine	7803-51-2	Yes	2.81E-04	3.85E-04		Facility	6.66E-04	5.31E-04	1.20E-03	24-hr	4.00E-01	2.70E-02	2.00E-02		no	2%	no	4%	0.04	4.25E-05	0%	5.35E-01	No	NA
Catechol	120-80-9	Yes		4.34E-02		Facility	4.34E-02	3.46E-02	7.80E-02	24-hr	2.00E+01	1.33E+00	1.00E-01		no	3%	no	6%	0.04	2.77E-03	3%	2.68E+00	No	NA
Sodium Hydoxide	1310-73-2	Yes			5.04E-03	Facility	5.04E-03	4.02E-03	9.06E-03	24-hr	2.00E+00	1.33E-01	1.00E-01		no	4%	no	7%	0.04	3.22E-04	0%	2.68E+00	No	NA
Arsine	7784-42-1	Yes	4.36E-04	3.62E-04		Facility	7.99E-04	6.37E-04	1.44E-03	24-hr	2.00E-01	1.30E-02	1.00E-02		no	6%	no	11%	0.04	5.09E-05	1%	2.68E-01	No	NA
Tetraethylorthosilicate	78-10-4	Yes	6.70E-02	3.04E-01		Facility	3.71E-01	2.95E-01	6.66E-01	24-hr	8.50E+01	5.67E+00	4.25E+00		no	7%	no	12%	0.04	2.36E-02	1%	1.14E+02	No	NA
Silicon tetrahydride	7803-62-5	Yes	2.17E-02	1.63E-02		Facility	3.81E-02	3.03E-02	6.84E-02	24-hr	7.00E+00	4.67E-01	3.50E-01		no	8%	no	15%	0.04	2.43E-03	1%	9.37E+00	No	NA
Calcium Hydroxide	1305-62-0	Yes			2.91E-02	Facility	2.91E-02	2.32E-02	5.23E-02	24-hr	5.00E+00	3.33E-01	2.50E-01		no	9%	no	16%	0.04	1.86E-03	1%	6.69E+00	No	NA
Acetic Acid	64-19-7	Yes	1.59E-01			Facility	1.59E-01	1.26E-01	2.85E-01	24-hr	2.50E+01	1.67E+00	1.25E+00		no	9%	no	17%	0.04	1.01E-02	1%	3.35E+01	No	NA
Magnesium Hydroxide	546-93-0	Yes			6.51E-02	Facility	6.51E-02	5.19E-02	1.17E-01	24-hr	1.00E+01	6.67E-01	5.00E-01		no	10%	no	18%	0.04	4.15E-03	1%	1.34E+01	No	NA
Hydrogen Bromide	10035-10-6	Yes	1.23E-03	6.16E-03		Facility	7.40E-03	5.90E-03	1.33E-02	24-hr	1.00E+01	6.67E-02	5.00E-01		no	11%	no	20%	0.04	4.72E-04	0%	1.34E+01	No	NA
Ammonia	7664-41-7	Yes	1.54E-03	2.05E-03	1.92E-01	Facility	1.96E-01	1.56E-01	3.52E-01	24-hr	1.80E+01	1.20E+00	9.00E-01		no	16%	no	29%	0.04	1.25E-02	1%	2.41E+01	No	NA
Silica, amorphous	112926-00-8	Yes		2.06E-01		Facility	2.06E-01	1.64E-01	3.71E-01	24-hr	1.00E+01	6.67E-01	5.00E-01		no	31%	no	56%	0.04	1.32E-02	3%	1.34E+01	No	NA
Nitric Acid	7697-37-2	Yes	1.14E-01	6.55E-03		Facility	1.21E-01	9.62E-02	2.17E-01	24-hr	5.00E+00	3.33E-01	2.50E-01		no	36%	no	65%	0.04	7.70E-03	3%	6.69E+00	No	NA
Hydrogen Chloride	7647-01-0	Yes	3.74E-02	2.77E-02		Facility	6.51E-02	5.19E-02	1.17E-01	24-hr	7.50E+00	5.00E-02	3.75E-01		yes	130%	yes	234%	0.04	4.15E-03	1%	1.00E+01	No	NA
Silicon Dioxide	14808-60-7	Yes			9.30E-03	Facility	9.30E-03	7.41E-03	1.67E-02	24-hr	1.00E-01	6.70E-03	5.00E-03		yes	139%	yes	249%	0.04	5.93E-04	12%	1.34E-01	No	NA
Phosphoric acid	7664-38-2	Yes	5.09E-02	1.17E-01		Facility	1.67E-01	1.34E-01	3.01E-01	24-hr	1.00E+00	6.70E-02	5.00E-02		yes	250%	yes	449%	0.04	1.07E-02	21%	1.34E+00	No	NA
Hydrogen Peroxide	7722-84-1	Yes	1.29E-01	1.74E-01		Facility	3.03E-01	2.41E-01	5.44E-01	24-hr	1.50E+00	1.00E-01	7.50E-02		yes	303%	yes	544%	0.04	1.93E-02	26%	2.01E+00	No	NA
Sulfuric acid	7664-93-9	Yes	7.32E-01	0.00E+00		Facility	7.32E-01	5.83E-01	1.32E+00	24-hr	1.00E+00	6.70E-02	5.00E-02		yes	1092%	yes	1963%	0.04	4.67E-02	93%	1.34E+00	No	NA

Facility Chi/Q	**($\mu g/m^3$)/(g/s)**	
24-hr	282	0.0355 **[mg/m^3]/[lb/hr]**
Annual	40	4.9877 **[$\mu g/m^3$]/[lb/hr]**

Unit Conversions/Constants

1 g/s =	7.94 lb/hr
1 ug =	0.001 mg

Waste Recovery Profile

ON Semiconductors, Pocatello, ID

2002 Solvent Waste Recovery

Fab 9 Solvent Waste Profile[1]

Component	wt %
Isopropyl alcohol	61.18935%
Ethyl lactate	17.30660%
2-pentanone	17.13533%
Acetone	4.28666%
Novolak resin	0.02405%
PGMEA	0.01985%
Ethyl pyruvate	0.00634%
Methoxybenzene (Anisole)	0.00606%
Ethyl alcohol	0.00527%
Water	0.00383%
	99.98334%

Fab 10 Solvent Waste Profile[1]

Component	wt %
Isopropyl alcohol	36.98452%
Ethyl lactate	31.28468%
2-pentanone	31.25231%
Acetone	0.42764%
Novolak resin	0.02898%
2-heptanone	0.01580%
Butyl acetate	0.00235%
Water	0.00026%
	99.99654%

Solvent Waste Quantity[2]	208979 lbs
Fab 9 Portion[3]	58.4%

	Combined Waste Profile	2002 Constituent Usage Rate[4]	% Recovery Based on Constituent Usage
Isopropyl alcohol	106830.4 lbs	114141.2 lbs	94%
Ethyl lactate	48319.0 lbs	52286.5 lbs	92%
2-pentanone[5]	48081.9 lbs	47686.0 lbs	100%
Acetone	5603.4 lbs	30244.6 lbs	19%
Novolak resin	54.5 lbs	2300.9 lbs	2%
PGMEA	24.2 lbs	24.2 lbs	100%
Ethyl pyruvate	7.7 lbs	885.6 lbs	1%
Methoxybenzene (Anisole)	7.4 lbs	160.0 lbs	5%
Ethyl alcohol	6.4 lbs	245.7 lbs	3%
Water	4.9 lbs	-- lbs	--
2-heptanone	13.7 lbs	1444.8 lbs	1%
Butyl acetate	2.0 lbs	110.5 lbs	2%
Total	208956 lbs	249530 lbs	

[1] Don Hooper, "Solvent Waste Profile for Fab 9 and 10 8-2003.xls", supplied by AMIS 8/13/03.
[2] AMIS, "2002 worksheet for Annual Report to DEQ.xls", supplied by AMIS 8/06/03.
[3] Don Hooper, "Solvent Waste 2002 F9-F10 segregated.xls", supplied by AMIS 11/03/03.
[4] AMI 2002 Chemical Usage Inventory
[5] The 2-pentanone recovered in AMIS waste in 2002 was 0.8% more than the 2-pentanone used in 2002. Therefore, the percent recovery is 100%.

Spray Paint Evaluation

ON Semiconductors, Pocatello, ID

Paint Use and Emission Summary

Commercial Product Description	2002 Usage (lb)	Constituents	Constituent Concentration (wt%)	2002 Constituent Usage Rate (lbs/yr)	2002 Constituent Usage Rate[1] (lbs/hr)
Rustoleum White Gloss	22.5	Acetone	30.0	6.75	1.69E-01
VOC=550 g/L	22.5	Liquified Petroleum Gas	30.0	6.75	1.69E-01
SG=0.8660	22.5	Alkyd Resin	20.0	4.5	1.13E-01
	22.5	Titanium Dioxide	15.0	3.375	8.44E-02
	22.5	Magnesium Silicate	15.0	3.375	8.44E-02
	22.5	n-Butyl acetate	10.0	2.25	5.63E-02
	22.5	Xylene	10.0	2.25	5.63E-02
	22.5	Methyl ethyl ketone	10.0	2.25	5.63E-02
	22.5	Barium sulfate	10.0	2.25	5.63E-02
	22.5	Toluene	10.0	2.25	5.63E-02
	22.5	Ethylene Glycol Monobutyl Ether	5.0	1.125	2.81E-02
	22.5	Stoddard Solvents	5.0	1.125	2.81E-02
	22.5	Ethylbenzene	5.0	1.125	2.81E-02
	22.5	Aromatic Hydrocarbon	5.0	1.125	2.81E-02
	22.5	1,2,4-Trimethylbenzene	5.0	1.125	2.81E-02
Rustoleum Black Gloss	1.875	Acetone	30.0	0.5625	1.41E-02
VOC=550 g/L	1.875	Liquified Petroleum Gas	30.0	0.5625	1.41E-02
SG=0.8660	1.875	Alkyd Resin	20.0	0.375	9.38E-03
	1.875	Titanium Dioxide	15.0	0.28125	7.03E-03
	1.875	Magnesium Silicate	15.0	0.28125	7.03E-03
	1.875	n-Butyl acetate	10.0	0.1875	4.69E-03
	1.875	Xylene	10.0	0.1875	4.69E-03
	1.875	Methyl ethyl ketone	10.0	0.1875	4.69E-03
	1.875	Barium sulfate	10.0	0.1875	4.69E-03
	1.875	Toluene	10.0	0.1875	4.69E-03
	1.875	Ethylene Glycol Monobutyl Ether	5.0	0.09375	2.34E-03
	1.875	Stoddard Solvents	5.0	0.09375	2.34E-03
	1.875	Ethylbenzene	5.0	0.09375	2.34E-03
	1.875	Aromatic Hydrocarbon	5.0	0.09375	2.34E-03
	1.875	1,2,4-Trimethylbenzene	5.0	0.09375	2.34E-03
Rustoleum Primer	11.25	Liquified Petroleum Gas	30.0	3.375	8.44E-02
SG= 0.8600	11.25	Acetone	25.0	2.8125	7.03E-02
VOC=n/a	11.25	Alkyd Resin	10.0	1.125	2.81E-02
	11.25	Xylene	10.0	1.125	2.81E-02
	11.25	Magnesium Silicate	10.0	1.125	2.81E-02
	11.25	Titanium Dioxide	10.0	1.125	2.81E-02
	11.25	Stoddard Solvents	10.0	1.125	2.81E-02
	11.25	n-Butyl acetate	5.0	0.5625	1.41E-02
	11.25	Zinc Phosphate	5.0	0.5625	1.41E-02
	11.25	Ethylbenzene	5.0	0.5625	1.41E-02
	11.25	Basic Zinc Molybdate	5.0	0.5625	1.41E-02
Columbia Primer	11.17	Calcium Carbonate	16.8	1.87123965	4.68E-02
VOC= 1 lb/gal	11.17	Kaolin	8.9	0.996504936	2.49E-02
SG= 1.34	11.17	Titanium Dioxide	8.3	0.929475456	2.32E-02
	11.17	Ethylene Glycol	2.1	0.235720338	5.89E-03
Columbia Enamel	106.7	Titanium Dioxide	18.0	19.21911936	4.80E-01
VOC= 1.66 lb/gal	106.7	Calcium Carbonate	9.7	10.31920512	2.58E-01
SG=1.28	106.7	Ethylene Glycol	3.9	4.17250176	1.04E-01

Constituent Summary	2002 Combined Constituent Usage Rate (lbs/yr)	Maximum Potential Uncontrolled Emission Rate, PTE (lbs/yr)	Maximum Potential Uncontrolled Emission Rate, PTE[1] (lbs/hr)	PTE[2] 24-hr Avg (lbs/hr)	Is Constituent an Idaho 58.01.01 TAP?	OEL (mg/m3)	Idaho 58.01.01 Screening Emission Level (lb/hr)	Uncontrolled EL Threshhold (PTE/EL)	Is Uncontrolled PTE above EL? (Threshhold >1?)	Is Constituent a 42 USC 7412 HAP?	HAP PTE (lbs/hr)	HAP PTE (lbs/yr)	Is Constituent a VOC?	VOC PTE (lbs/hr)	VOC PTE (lbs/yr)
Acetone	10.125	10.13	0.2531	0.0211	yes	1780	119	0.000	No	no			yes	0.25	10.1
Alkyd Resin	6.000	6.00	0.1500	0.0125	no		n/a	n/a	No	no			no		
Aromatic Hydrocarbon	1.219	1.22	0.0305	0.0025	no		n/a	n/a	No	no			yes	0.03	1.2
Barium sulfate	2.438	2.44	0.0609	0.0051	no		n/a	n/a	No	no			no		
Basic Zinc Molybdate	0.563	0.56	0.0141	0.0012	yes		0.667	0.002	No	no			no		
Calcium Carbonate	12.190	12.19	0.3048	0.0254	yes	10	0.667	0.038	No	no			yes	0.30	12.2
Ethylbenzene	1.781	1.78	0.0445	0.0037	yes	435	29	0.000	No	yes	0.04	1.8	yes	0.04	1.8
Ethylene Glycol	4.408	4.41	0.1102	0.0092	yes (vapor)	127	0.846	0.011	No	yes	0.11	4.4	yes	0.11	4.4
Ethylene Glycol Monobutyl Ether	1.219	1.22	0.0305	0.0025	no		n/a	n/a	No	yes	0.03	1.2	yes	0.03	1.2
Kaolin	0.997	1.00	0.0249	0.0021	yes	2	0.133	0.016	No	no			no		
LPG	10.688	10.69	0.2672	0.0223	no		n/a	n/a	No	no			yes	0.27	10.7
Magnesium Silicate	4.781	4.78	0.1195	0.0100	no		n/a	n/a	No	no			no		
Methyl ethyl ketone	2.438	2.44	0.0609	0.0051	yes	590	39.3	0.000	No	yes	0.06	2.4	yes	0.06	2.4
n-Butyl acetate	3.000	3.00	0.0750	0.0063	yes	710	47.3	0.000	No	no			yes	0.08	3.0
Stoddard Solvent	2.344	2.34	0.0586	0.0049	yes	525	35	0.000	No	no			yes	0.06	2.3
Titanium Dioxide	24.930	24.93	0.6232	0.0519	no		n/a	n/a	No	no			no		
Toluene	2.438	2.44	0.0609	0.0051	yes	375	25	0.000	No	yes	0.06	2.4	yes	0.06	2.4
1,2,4-Trimethylbenzene	1.219	1.22	0.0305	0.0025	yes	123	8.2	0.000	No	no			yes	0.03	1.2
Xylene	3.563	3.56	0.0891	0.0074	yes	435	29	0.000	No	yes	0.09	3.6	yes	0.09	3.6
Zinc Phosphate	0.563	0.56	0.0141	0.0012	no		n/a	n/a	No	no			no		
										Total =	0.40	15.8	Total =	1.42	56.6

Notes: 1) Hourly rates based on 40 hrs operation per year
2) Assumes two hour painting activites in a twenty-four hour period

Paint Use Evaluation		
	VOCs tpy	HAP tpy
Paint	0.03	0.01
Process	34.83	6.97
% of use	0.08%	0.11%

Appendix G

Scrubber Unit Specification

Scrubber Unit Specification

Emission Unit ID	Control Equipment Name	Control Equipment ID	Stack ID	Manufacturer	Model No.	Date of Installation	Type	Dimensions in Feet (HtxDiaxL)	Water Flow (gpm)	Pressure Drop (in H2O)	Minimum Removal Efficiency (%)
Fab 9 & Fab 10	Bld D, Scrubber 1	DSCRUB1	DSCRUBF1,2, or 3	Harrington	79-3	1984	wet/spray	9.6 x 7x 9	50	0.5	90%
Fab 9 & Fab 10	Bld D, Scrubber 2	DSCRUB2	DSCRUBF1,2, or 3	Harrington	79-3	1984	wet/spray	9.6 x 7x 9	50	0.5	90%
Fab 9 & Fab 10	Bld D, Scrubber 5	DSCRUB5	DSCRUB5	Harrington	ECH-55-5LB	1997	wet/spray	6 x 5 x 6.7	20	0.85	90%
Fab 9 & Fab 10	Bld D, Scrubber 10	DSCRUB10	DSCRUB10	Harrington	ECH-44-3LB	1990	wet/spray	6.7 x 4.1 x 4.5	10	0.5	90%
Fab 9 & Fab 10	Bld D, Scrubber 14	DSCRUB14	DSCRUB14	Harrington	ECH-33-5LB	1996	wet/spray	5.6 x 3.2 x 5	20	0.35	90%
Bld F	Bld F, Scrubber 1	FSCRUB1	FSCRUB1	Harrington	HPH 34-3	1983	Wet/spray	5.2 x 4 x 9.3	44	1.5	90%
Fab 9 & Fab 10	Bld H, Scrubber 1	HSCRUB1	HSCRUB1	Harrington	ECH-9 11-5LB	1997	wet/spray	11 x 11.2 x 7.5	80	0.4	90%
Fab 9 & Fab 10	Bld H, Scrubber 2	HSCRUB2	HSCRUB2	Harrington	ECH-9 11-5LB	1997	wet/spray	11 x 11.2 x 7.5	80	0.8	90%
Fab 9 & Fab 10	Bld H, Scrubber 3	HSCRUB3	HSCRUB3	Harrington	ECH-9 11-5LB	2004	wet/spray	11 x 11.2 x 7.5	80	0.5	90%
Fab 9 & Fab 10	Bld H, Scrubber 4	HSCRUB4	HSCRUB4	Harrington	ECH-9 11-5LB	2000	wet/spray	11 x 11.2 x 7.5	80	0.7	90%
Fab 9 & Fab 10	Bld H, Scrubber 7	HSCRUB7	HSCRUB7F1 or F2	Tri-mer	F/WR-10-48-2	2011	wet/spray	12.33 x 7.75 x 15.5	140	0.1	90%

Appendix H

Cooling Tower Specifications

Cooling Tower Specifications

Location	Emission Unit ID	Conductivity	Total Dissolved Solids[1]	MAX FLOW	On-line Rating (hrs/yr)	Cooling Water	Remarks
		(µmho/cm)	(ppm)	(GPM)	Used for PTE	(GPH)	
Building B	BCT1	2,900	1,856	1,870	8,760	112,200	Vertical discharge, Crossflow, Induced draft. One tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).
Building B	BCT2	2,900	1,856	858	4,380	51,480	Vertical discharge, Crossflow, Induced draft. One tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.
Building C	CCT1	2,900	1,856	1,600	8,760	96,000	Vertical discharge, Crossflow, Induced draft. One tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).
Building C	CCT2	2,900	1,856	1,600	4,380	96,000	Vertical discharge, Crossflow, Induced draft. One tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.
Building D	DCT1	2,900	1,856	1,787	8,760	107,220	Vertical discharge, Crossflow, Induced draft. One tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).
Building D	DCT2	2,900	1,856	1,787	4,380	107,220	Vertical discharge, Crossflow, Induced draft. One tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.
Building G	GCT1	2,900	1,856	3,000	8,760	180,000	Vertical discharge, Crossflow, Induced draft. Both towers (GCT1 and GCT2) are assumed to operate year round.
Building G	GCT2	2,900	1,856	3,000	8,760	180,000	Vertical discharge, Crossflow, Induced draft. Both towers (GCT1 and GCT2) are assumed to operate year round.

1. The web site http://www.lenntech.com/unit-conversion-calculator/tds_engels.htm provided the conversion from umho/cm to ppm.

Appendix I

Diesel Generator Test Results

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Performance Specifications-CEMGENS I-1
Performance Specifications-GOEEMGEN I-11
Performance Specifications-GEEMGEN I-19

Performance Specifications-CEMGENS

ON Semiconductor®

CATERPILLAR®

GEN SET PACKAGE PERFORMANCE DATA [1KZ00481]

SEPTEMBER 14, 2011

(1KZ00481)-ENGINE (2GN01273)-GENERATOR (CMJ00228)-GENSET

For Help Desk Phone Numbers Click here

Performance Number: DM6686

Change Level: 00

Sales Model: 3512 DITA
Combustion: DI
Aspr: TA
Engine Power:
1250 W/F EKW 1252 W/O F EKW 1,818 HP
Speed: 1,800 RPM
After Cooler: JWAC
Manifold Type: DRY
Governor Type: WDWRD
After Cooler Temp(F): 180
Turbo Quantity:
Engine App: GP
Turbo Arrangement:
Hertz: 60
Application Type: PACKAGE-DIE
Engine Rating: PGS
Strategy:
Rating Type: STANDBY
Certification:

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,250	100	1817	253.09	0.36	93.52	199.22	63.05	3,743.36	1,286.24	1,007.06	10,799.24
1,125	90	1638	228.15	0.35	82.71	195.44	57.75	3,549.13	1,186.7	928.58	9,665.63
1,000	80	1461	203.64	0.35	72.75	191.84	51.38	3,270.14	1,110.56	874.4	8,549.69
937.5	75	1373	191.31	0.35	68.47	190.04	47.5	3,114.76	1,080.14	863.6	8,069.41
875	70	1285	179.12	0.35	64.48	188.24	43.41	2,962.9	1,052.6	858.02	7,642.1
750	60	1111	154.76	0.36	56.64	185.36	35.33	2,673.32	1,009.4	845.96	6,826.33
625	50	937	130.54	0.36	48.85	182.84	27.6	2,390.81	971.6	829.22	6,024.69
500	40	768	106.89	0.38	41.26	180.5	20.49	2,118.88	929.66	808.52	5,240.7
375	30	595	82.96	0.39	33.52	177.98	14.13	1,843.43	865.22	777.02	4,442.59
312.5	25	508	70.78	0.41	29.59	176.72	11.28	1,705.7	825.26	755.78	4,040
250	20	420	58.45	0.43	25.65	175.64	8.65	1,571.5	779.72	730.94	3,633.88
125	10	241	33.65	0.51	17.73	174.2	4.98	1,377.27	654.62	629.06	2,909.93

Engine Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,250	100	48,055.1	7,165.6	81,437.7	47,031.4	10,009.1	12,909.5	77,058.7	200,636.9	213,717.0
1,125	90	42,254.3	6,881.3	70,234.3	38,842.1	8,871.7	10,407.2	69,438.1	177,263.4	188,808.0
1,000	80	37,363.5	6,596.9	61,248.9	32,188.3	7,791.2	8,075.5	61,988.2	156,904.0	167,197.5
937.5	75	35,202.5	6,540.0	57,666.1	29,970.4	7,336.2	6,995.0	58,234.8	147,975.4	157,586.4
875	70	33,155.1	6,426.3	54,253.9	28,207.5	6,938.1	5,971.3	54,481.3	139,217.5	148,316.7
750	60	29,003.6	6,198.8	47,600.1	24,738.4	6,085.1	4,037.8	47,088.3	121,929.0	129,890.8
625	50	24,852.1	5,914.5	41,116.9	21,326.2	5,232.0	2,331.7	39,752.1	104,811.2	111,635.6
500	40	20,814.4	5,687.0	34,918.1	17,970.9	4,435.9	966.8	32,529.6	88,262.0	94,005.9
375	30	16,833.5	5,402.6	28,776.2	14,501.8	3,582.8	-56.9	25,250.2	71,599.2	76,319.4
312.5	25	14,843.0	5,288.9	25,705.2	12,682.0	3,184.7	-511.8	21,553.7	63,239.3	67,390.8
250	20	12,852.6	5,118.3	22,634.2	10,919.0	2,729.8	-853.0	17,800.3	54,879.4	58,462.2
125	10	8,871.7	4,890.8	16,492.3	6,881.3	1,876.7	-1,308.0	10,236.6	37,932.2	40,434.5

http://tmiwebclassic.cat.com/tmi/servlet/TMIDirector?Action=buildtab&refkind=RNTMIRefNum&tab=P... 9/14/2011

EXHAUST Sound Data: 4.92 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	115	105	120	116	108	106	108	107	106
1,125	90	114	104	119	115	107	105	107	107	105
1,000	80	113	103	118	114	106	105	106	106	104
937.5	75	113	103	118	114	106	104	105	105	103
875	70	112	102	117	113	105	104	105	105	103
750	60	111	101	116	112	104	102	104	104	102
625	50	110	100	115	111	103	101	103	102	101
500	40	109	99	114	110	102	100	101	101	99
375	30	107	98	112	108	100	99	100	100	98
312.5	25	107	97	112	108	100	98	99	99	97
250	20	106	96	111	107	99	97	98	98	96
125	10	104	94	109	105	97	95	96	96	94

EXHAUST Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	101	93	109	104	95	93	94	94	91
1,125	90	101	92	109	103	94	93	93	93	90
1,000	80	100	91	108	102	93	92	92	92	89
937.5	75	99	91	107	101	93	91	92	92	89
875	70	99	90	107	101	92	91	91	91	88
750	60	98	89	106	100	91	90	90	90	87
625	50	96	88	104	99	90	88	89	89	86
500	40	95	87	103	97	89	87	88	88	85
375	30	94	85	102	96	87	86	87	86	84
312.5	25	93	85	101	95	87	85	86	86	83
250	20	92	84	100	94	86	84	85	85	82
125	10	90	82	98	92	84	82	83	83	80

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EXHAUST Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	95	86	103	97	88	87	88	87	85
1,125	90	94	85	102	96	88	86	87	87	84
1,000	80	93	84	101	95	87	85	86	86	83
937.5	75	93	84	101	95	86	85	85	85	82
875	70	92	83	100	94	86	84	85	85	82
750	60	91	82	99	93	85	83	84	84	81
625	50	90	81	98	92	83	82	83	82	80
500	40	89	80	97	91	82	81	81	81	78
375	30	87	79	95	89	81	79	80	80	77
312.5	25	87	78	95	89	80	79	79	79	76
250	20	86	77	94	88	79	78	78	78	75
125	10	84	75	92	86	77	76	76	76	73

MECHANICAL Sound Data: 3.28 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	113	116	125	116	107	101	100	98	102
1,125	90	113	116	125	116	107	101	100	98	102
1,000	80	113	116	125	116	107	101	100	98	102
937.5	75	113	116	125	116	107	101	100	98	102
875	70	113	116	125	116	107	101	100	98	102
750	60	113	116	125	116	107	101	100	98	102
625	50	113	116	125	116	107	101	100	98	102
500	40	113	116	125	116	107	101	100	98	102
375	30	113	116	125	116	107	101	100	98	102
312.5	25	113	116	125	116	107	101	100	98	102
250	20	113	116	125	116	107	101	100	98	102
125	10	113	116	125	116	107	101	100	98	102

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MECHANICAL Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
1,250	100	100	102	112	102	94	89	89	86	90
1,125	90	100	102	112	102	94	89	89	86	90
1,000	80	100	102	112	102	94	89	89	86	90
937.5	75	100	102	112	102	94	89	89	86	90
875	70	100	102	112	102	94	89	89	86	90
750	60	100	102	112	102	94	89	89	86	90
625	50	100	102	112	102	94	89	89	86	90
500	40	100	102	112	102	94	89	89	86	90
375	30	100	102	112	102	94	89	89	86	90
312.5	25	100	102	112	102	94	89	89	86	90
250	20	100	102	112	102	94	89	89	86	90
125	10	100	102	112	102	94	89	89	86	90

MECHANICAL Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	93	96	105	96	87	83	83	80	84
1,125	90	93	96	105	96	87	83	83	80	84
1,000	80	93	96	105	96	87	83	83	80	84
937.5	75	93	96	105	96	87	83	83	80	84
875	70	93	96	105	96	87	83	83	80	84
750	60	93	96	105	96	87	83	83	80	84
625	50	93	96	105	96	87	83	83	80	84
500	40	93	96	105	96	87	83	83	80	84
375	30	93	96	105	96	87	83	83	80	84
312.5	25	93	96	105	96	87	83	83	80	84
250	20	93	96	105	96	87	83	83	80	84
125	10	93	96	105	96	87	83	83	80	84

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RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,250	100	1817	47.7400	9.3300	.5300	1.0800	11.4000	2.9000	1.3200
937.5	75	1373	34.3900	4.8200	1.2800	.6000	11.8000	2.9000	1.2900
625	50	937	23.9100	3.0100	1.2500	.5700	12.7000	2.9000	1.3100
312.5	25	508	12.4800	2.6500	1.1000	.8000	13.8000	4.2000	1.3800
125	10	241	6.5600	2.9900	1.2600	.6300	15.1000	5.5000	1.5000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,250	100	1817	39.7800	5.1800	.4000	2,227.1	.7700	11.4000	2.9000	1.3200
937.5	75	1373	28.6600	2.6800	.9600	1,554.7	.4300	11.8000	2.9000	1.2900
625	50	937	19.9300	1.6700	.9400	1,101.7	.4100	12.7000	2.9000	1.3100
312.5	25	508	10.4000	1.4700	.8300	663.3	.5700	13.8000	4.2000	1.3800
125	10	241	5.4700	1.6600	.9500	391.2	.4500	15.1000	5.5000	1.5000

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Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp
984.25 F	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,791.6 hp	1,818.42 hp
1,640.42 F	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,805.01 hp	1,748.69 hp	1,818.42 hp
3,280.84 F	1,818.42 hp	1,815.74 hp	1,755.4 hp	1,699.07 hp	1,646.77 hp	1,791.6 hp
4,921.26 F	1,768.81 hp	1,708.46 hp	1,652.14 hp	1,598.5 hp	1,548.88 hp	1,704.44 hp
6,561.68 F	1,662.86 hp	1,605.2 hp	1,552.9 hp	1,503.28 hp	1,456.35 hp	1,619.95 hp
8,202.1 F	1,562.29 hp	1,508.65 hp	1,459.03 hp	1,412.09 hp	1,369.18 hp	1,539.49 hp
9,842.52 F	1,467.08 hp	1,416.12 hp	1,369.18 hp	1,326.27 hp	1,284.7 hp	1,461.71 hp
10,498.69 F	1,429.53 hp	1,381.25 hp	1,335.66 hp	1,292.74 hp	1,252.51 hp	1,432.21 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	1979048	**Lube Oil Press @ Rated Spd(PSI):**	55.8
Effective Serial No:	1KZ00314	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,173.2
Primary Engine Test Spec:	0K3134	**Max Operating Altitude(FT):**	2,788.7
Performance Parm Ref:	TM5739	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM6686	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:	TM3097	**Turbocharger Model**	TV9211-1.7
Certification Ref:		**Fuel Injector**	1111775
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	13.5	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	180	**Unit Injector Timing (MM):**	86.8
Crankcase Blowby Rate(CFH):	907.6	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	8.1	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	**Peak Torque (LB/FT):**	--

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Reference Number: DM6686 --

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER +/- 3%
EXHAUST STACK TEMPERATURE +/- 8%
GENERATOR POWER +/- 5%
INLET AIR FLOW +/- 5%
INTAKE MANIFOLD PRESSURE - GAGE +/- 10%
EXHAUST FLOW +/- 6%
SPECIFIC FUEL CONSUMPTION +/- 3%
FUEL RATE +/- 5%
HEAT REJECTION +/- 5%
HEAT REJECTION EXHAUST ONLY +/- 10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1349. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1349, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS

Reference Number: DM6686 --

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER +/- 3%
EXHAUST STACK TEMPERATURE +/- 8%
GENERATOR POWER +/- 5%
INLET AIR FLOW +/- 5%
INTAKE MANIFOLD PRESSURE - GAGE +/- 10%
EXHAUST FLOW +/- 6%
SPECIFIC FUEL CONSUMPTION +/- 3%
FUEL RATE +/- 5%
HEAT REJECTION +/- 5%
HEAT REJECTION EXHAUST ONLY +/- 10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1349. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1349, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS

EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

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Performance Specifications-GOEEMGEN

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EMISSIONS CERT. [1HZ00791] **DECEMBER 07, 2004**

(1HZ00791)-ENGINE (4FN01962)-GENERATOR (BPD00452)-GENSET

Emissions Certification

Serial Number	1HZ00791
Arrgmt Number	1889442
Spec Number	0K2944
Certification - 1	NONROAD - EUROPEAN UNION EXEMPT
Certification - 2	Nonroad - EPA, CARB, Cert
Has Engine Been Rerated?	No
Interlock Code Actual Progression	No Interlock Code Progression
As - Shipped Interlock Code	No Interlock Code
As - Shipped Flash File	1808677
As - Shipped Flash File CRB	1808678
As - Shipped CORR FL Power	2,934 HP (2,188.0 KW)
Build Date	2001-05-01

CATERPILLAR GOEMGEN

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GEN SET PACKAGE PERFORMANCE DATA [1HZ00791] DECEMBER 07, 2004

(1HZ00791)-ENGINE (4FN01962)-GENERATOR (BPD00452)-GENSET

Performance Number: DM4683 **Change Level:** 00

Sales Model: 3516BDITA **Combustion:** DI **Aspr:** TA

Engine Power:

1825 W/F EKW 1880 W/O F EKW **Speed:** 1,800 RPM **After Cooler:** SCAC

2,628 HP

Manifold Type: DRY **Governor Type:** ADEM **After Cooler Temp(F):** 140

Turbo Quantity: 4 **Engine App:** GP **Turbo Arrangement:** Parallel

Hertz: 60 **Engine Rating:** PGS **Strategy:**

Rating Type: PRIME **Certification:** EPA TIER-I 2000 - 2005

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL RATE LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,825.0	100	2,593.0	271	0.332	123.1	176.0	73.7	5,812.8	1,107.1	807.8	14,256.5
1,642.5	90	2,337.9	244	0.334	111.6	171.0	67.0	5,487.9	1,063.4	782.2	13,172.4
1,460.0	80	2,084.2	218	0.339	100.8	167.5	60.5	5,155.9	1,028.7	763.5	12,187.1
1,368.8	75	1,957.8	205	0.341	95.4	165.7	57.1	4,972.3	1,011.7	757.0	11,682.1
1,277.5	70	1,831.2	191	0.343	89.8	163.6	52.8	4,735.7	995.0	753.6	11,117.1
1,095.0	60	1,579.1	165	0.349	78.6	159.4	44.2	4,259.0	961.5	747.0	9,955.2
912.5	50	1,327.6	139	0.355	67.3	155.3	35.6	3,782.2	928.2	740.3	8,740.4
730.0	40	1,080.3	113	0.363	56.0	151.7	27.3	3,309.0	879.3	721.9	7,497.3
547.5	30	830.0	87	0.376	44.6	148.8	19.2	2,828.7	813.4	689.7	6,240.1
456.3	25	703.6	74	0.386	38.8	147.4	15.1	2,588.6	773.8	668.3	5,604.4
365.0	20	576.4	60	0.401	33.0	146.5	11.8	2,362.6	721.4	633.0	4,968.8
182.5	10	319.6	33	0.467	21.3	145.4	6.4	1,938.8	588.9	535.1	3,690.4

Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,825.0	100	40,605	7,677	98,442	49,534	13,194	25,193	109,986	264,672	281,904
1,642.5	90	37,762	7,336	89,399	43,960	12,000	21,838	99,124	239,820	255,460
1,460.0	80	34,975	6,995	80,926	39,354	10,805	18,540	88,376	215,764	229,811
1,368.8	75	33,610	6,881	76,661	37,307	10,237	16,890	83,030	203,765	217,072
1,277.5	70	32,188	6,711	72,452	35,202	9,668	15,298	77,684	191,765	204,277
1,095.0	60	29,231	6,426	63,979	31,108	8,417	12,170	66,936	167,823	178,742
912.5	50	26,160	6,085	55,505	27,070	7,222	9,213	56,301	143,881	153,264
730.0	40	22,919	5,801	46,975	22,464	6,028	6,483	45,837	120,109	127,957
547.5	30	19,393	5,460	38,103	17,459	4,777	4,038	35,202	95,883	102,195
456.3	25	17,516	5,289	33,553	14,900	4,152	2,900	29,857	83,599	89,058
365.0	20	15,582	5,118	28,833	12,000	3,526	1,820	24,454	71,144	75,808
182.5	10	11,488	4,663	18,995	6,313	2,275	-57	13,535	45,723	48,737

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EMISSIONS DATA

EPA TIER-I 2000 - 2005 ********** A4

Gaseous emissions data measurements are consistent with those described in EPA 40 CFR PART 89 SUBPART D and ISO 8178 for measuring HC, CO, PM, and NOx.

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kW-hr			
U.S. (incl Calif)	EPA/Tier-1	CO:11.4	HC:1.3	NOx:9.2	PM:0.54

EXHAUST STACK DIAMETER	8 IN
WET EXHAUST MASS	26,433.39 LB/HR
WET EXHAUST FLOW (983 DEG F STACK TEMP)	14,267.14 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	5,559.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	5,092.38 STD CFM
FUEL FLOW RATE	123 GAL/HR

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RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,825.0	100	2,593.0	52.69	0.97	0.97	.480	11.00	1.4	1.28
1,368.8	75	1,957.8	29.36	1.09	0.96	.490	12.00	1.7	1.28
912.5	50	1,327.6	17.66	1.37	0.76	.430	12.70	2.5	1.28
456.3	25	703.6	9.48	1.44	0.53	.300	14.00	2.1	1.28
182.5	10	319.6	6.73	2.05	0.52	.180	15.90	1.5	1.28

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,825.0	100	2,593.0	43.90	0.54	0.73	2,571.0	0.340	11.00	1.4	1.28
1,368.8	75	1,957.8	24.47	0.60	0.73	1,984.3	0.350	12.00	1.7	1.28
912.5	50	1,327.6	14.72	0.76	0.57	1,392.4	0.310	12.70	2.5	1.28
456.3	25	703.6	7.90	0.80	0.40	803.3	0.210	14.00	2.1	1.28
182.5	10	319.6	5.61	1.14	0.39	428.4	0.130	15.90	1.5	1.28

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Altitude Capability Data

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp
984 F	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp
1,640 F	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp
3,281 F	2,628 hp	2,628 hp	2,628 hp	2,620 hp	2,540 hp	2,628 hp
4,921 F	2,628 hp	2,628 hp	2,547 hp	2,466 hp	2,390 hp	2,628 hp
6,562 F	2,564 hp	2,477 hp	2,395 hp	2,319 hp	2,246 hp	2,498 hp
8,202 F	2,408 hp	2,327 hp	2,250 hp	2,178 hp	2,111 hp	2,374 hp
9,843 F	2,261 hp	2,185 hp	2,112 hp	2,045 hp	1,982 hp	2,254 hp
10,499 F	2,205 hp	2,130 hp	2,060 hp	1,993 hp	1,931 hp	2,207 hp

Identification Reference and Notes

Engine Arrangement:	1979039	Lube Oil Press @ Rated Spd(PSI):	55.8
Effective Serial No:	1HZ00474	Piston Speed @ Rated Eng SPD (FT/Min):	2,173.2
Primary Engine Test Spec:	0K2955	Max Operating Altitude(FT):	4,921.3
Performance Parm Ref:	TM5739	PEEC Elect Control Module Ref	
Performance Data Ref:	DM4683	PEEC Personality Cont Mod Ref	
Aux Coolant Pump Perf Ref:	DM1286		
Cooling System Perf Ref:	DM1299	Turbocharger Model	BTV8501-1.23
Certification Ref:	EPA TIER-I	Fuel Injector	1008774
Certification Year:	2000	Timing-Static (DEG):	--
Compression Ratio:	14.0	Timing-Static Advance (DEG):	--
Combustion System:	DI	Timing-Static (MM):	--
Aftercooler Temperature (F):	140	Unit Injector Timing (MM):	64.3
Crankcase Blowby Rate(CFH):	2,627.4	Torque Rise (percent)	--
Fuel Rate (Rated RPM) No Load (Gal/HR):	14.5	Peak Torque Speed RPM	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	Peak Torque (LB/FT):	--

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Reference Number: DM4683 EPA TIER-I 20002005A4

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER	+/-	3%
EXHAUST STACK TEMPERATURE	+/-	8%
GENERATOR POWER	+/-	5%
INLET AIR FLOW	+/-	5%
INTAKE MANIFOLD PRESSURE - GAGE	+/-	10%
EXHAUST FLOW	+/-	6%
SPECIFIC FUEL CONSUMPTION	+/-	3%
FUEL RATE	+/-	5%
HEAT REJECTION	+/-	5%
HEAT REJECTION EXHAUST ONLY	+/-	10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

DEFINITIONS:

http://tmiwcb.cat.com/tmi/servlet/cat.edis.tmiweb.gui.TMIDirector?Action=buildtab&ref... 12/07/2004

STANDBY - MAXIMUM OUTPUT AVAILABLE FOR NON PROGRAMMED POWER OUTAGES. THE EXPECTED USAGE SHOULD BE APPROXIMATELY 30 HOURS PER YEAR AND THE AVERAGE DEMAND, DURING THE OUTAGE, SHOULD NOT EXCEED THE CORRESPONDING INDUSTRIAL ENGINE CONTINUOUS RATING. STANDBY RATINGS MAY BE USED IN PEAK SHAVING AND DURING INTERRUPTIBLE UTILITY SERVICE IF THE FOLLOWING CRITERIA ARE MET.

500	HOURS/YEAR OR LESS
60%	MAXIMUM AVERAGE LOAD FACTOR
80%	LOAD PEAK DEMAND
100%	LOAD USED ONLY FOR EMERGENCIES

PRIME POWER - OUTPUT AVAILABLE FOR PEAK DEMAND OF A VARIABLE ELECTRIC LOAD INCLUDING PEAK SHAVING AND PROGRAMMED OUTAGES. THE AVERAGE DEMAND DURING ANY 24 HOUR PERIOD SHOULD NOT EXCEED THE CORRESPONDING INDUSTRIAL ENGINE CONTINUOUS RATING. ALL PRIME POWER RATINGS, EXCEPT D SERIES, HAVE 10% OVERLOAD FOR EMERGENCY USE.

CONTINUOUS - OUTPUT WHICH MAY BE UTILIZED CONTINUOUSLY WITHOUT LOAD CYCLING. ALL 3600 ENGINE CONTINUOUS RATINGS HAVE 10% OVERLOAD CAPABILITY.

CATERPILLAR

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Performance Specifications-GEEMGEN

GEN SET PERFORMANCE DATA [24Z06050]

SEPTEMBER 14, 2011

For Help Desk Phone Numbers Click here

Performance Number: TM3401

Change Level: 10

Sales Model: 3512 DITA
Combustion: DI
Aspr: TA
Engine Power:
1252 W/O F EKW
1,818 HP
Speed: 1,800 RPM
After Cooler: JWAC
Manifold Type: DRY
Governor Type: WDWRD
After Cooler Temp(F): 180
Turbo Quantity:
Engine App: GS
Turbo Arrangement:
Hertz: 60
Application Type: GEN SET-DIE
Engine Rating: GS
Strategy:
Rating Type: STANDBY
Certification:

General Performance Data

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,252	100	1764	245.7	0.36	89.71	194.36	54.13	3,524.41	1,271.48	1,011.74	10,145.91
1,126.8	90	1583	220.61	0.35	79.89	190.94	47.68	3,238.36	1,207.04	972.32	9,058.22
1,001.6	80	1405	195.66	0.35	70.93	187.88	40.45	2,959.37	1,162.04	942.26	8,101.19
939	75	1316	183.33	0.35	66.65	186.44	36.84	2,814.58	1,142.78	932	7,649.16
876.4	70	1227	171	0.36	62.45	185.18	33.26	2,669.79	1,123.52	923.54	7,207.73
751.2	60	1051	146.35	0.36	54.45	183.02	26.27	2,387.27	1,084.82	910.58	6,367.24
626	50	875	121.98	0.37	46.57	180.86	19.6	2,108.29	1,044.68	898.16	5,572.66
500.8	40	704	98.05	0.39	38.89	177.98	13.5	1,857.55	979.88	874.22	4,813.39
375.6	30	531	73.97	0.41	31.15	174.56	8	1,631.54	886.1	828.32	4,078.85
313	25	443	61.79	0.43	27.26	172.94	5.48	1,529.13	829.94	797.54	3,722.17
250.4	20	356	49.46	0.46	23.35	171.68	3.38	1,437.31	767.66	754.7	3,372.55
125.2	10	179	24.95	0.61	15.53	170.06	0.21	1,278.39	624.2	637.34	2,701.57

Engine Heat Rejection Data

GEN PWR EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,252	100	46,235.2	7,165.6	77,286.2	44,642.9	10,293.5	9,611.0	74,783.9	192,561.4	205,072.8
1,126.8	90	41,060.1	6,881.3	67,618.3	38,330.3	9,156.0	7,450.0	67,163.3	171,462.7	182,609.2
1,001.6	80	36,339.9	6,596.9	59,656.5	33,212.0	8,132.4	5,459.5	59,542.8	152,183.8	162,136.0
939	75	34,178.8	6,483.2	56,130.6	30,994.1	7,620.6	4,492.7	55,789.4	143,027.8	152,354.4
876.4	70	31,960.9	6,369.4	52,718.4	28,946.8	7,165.6	3,639.7	52,035.9	134,042.3	142,800.3
751.2	60	27,752.5	6,085.1	46,121.5	25,193.4	6,255.7	2,104.2	44,529.1	116,867.6	124,488.2
626	50	23,601.0	5,800.7	39,695.2	21,724.3	5,345.8	853.0	37,136.0	99,977.2	106,460.4
500.8	40	19,677.0	5,573.2	33,553.2	18,198.4	4,435.9	-113.7	29,856.7	83,428.1	88,887.6
375.6	30	15,696.1	5,288.9	27,468.2	14,445.0	3,525.9	-796.2	22,520.5	66,822.1	71,201.1
313	25	13,705.6	5,175.2	24,454.1	12,568.2	3,127.8	-1,080.5	18,823.9	58,462.2	62,272.5
250.4	20	11,715.2	5,061.4	21,383.1	10,634.7	2,672.9	-1,251.1	15,070.5	50,102.4	53,400.8
125.2	10	7,734.3	4,777.1	15,298.0	6,540.0	1,763.0	-1,478.6	7,563.7	33,325.8	35,486.8

Performance Data

EXHAUST Sound Data: 4.92 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	115	105	120	116	108	106	107	107	105
1,126.8	90	114	104	119	115	107	105	106	106	104
1,001.6	80	113	103	118	114	106	104	106	105	103
939	75	112	103	117	113	105	104	105	105	103
876.4	70	112	102	117	113	105	103	104	104	102
751.2	60	111	101	116	112	104	102	103	103	101
626	50	109	100	114	110	102	101	102	102	100
500.8	40	108	98	113	109	101	100	101	101	99
375.6	30	107	97	112	108	100	98	100	99	97
313	25	106	96	111	107	99	97	99	99	97
250.4	20	105	95	110	106	98	97	98	98	96
125.2	10	103	93	108	104	96	94	96	95	93

EXHAUST Sound Data: 22.97 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	101	93	109	103	95	93	94	94	91
1,126.8	90	100	92	108	103	94	92	93	93	90
1,001.6	80	99	91	107	102	93	91	92	92	89
939	75	99	90	107	101	92	91	92	91	89
876.4	70	98	90	106	101	92	90	91	91	88
751.2	60	97	89	105	99	91	89	90	90	87
626	50	96	87	104	98	90	88	89	89	86
500.8	40	95	86	103	97	88	87	87	87	85
375.6	30	93	85	101	96	87	85	86	86	83
313	25	93	84	101	95	86	85	85	85	82
250.4	20	92	83	100	94	85	84	84	84	81
125.2	10	89	81	97	92	83	81	82	82	79

Performance Data

EXHAUST Sound Data: 49.21 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	95	86	103	97	88	87	87	87	84
1,126.8	90	94	85	102	96	87	86	86	86	83
1,001.6	80	93	84	101	95	86	85	85	85	83
939	75	92	84	100	94	86	84	85	85	82
876.4	70	92	83	100	94	85	84	84	84	81
751.2	60	91	82	99	93	84	83	83	83	80
626	50	89	81	97	92	83	81	82	82	79
500.8	40	88	80	96	90	82	80	81	81	78
375.6	30	87	78	95	89	80	79	79	79	77
313	25	86	77	94	88	80	78	79	78	76
250.4	20	85	76	93	87	79	77	78	78	75
125.2	10	83	74	91	85	76	75	75	75	73

MECHANICAL Sound Data: 3.28 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	104	91	99	100	98	99	100	98	102
1,126.8	90	104	91	99	100	98	99	100	98	102
1,001.6	80	104	91	99	100	98	99	100	98	102
939	75	104	91	99	100	98	99	100	98	102
876.4	70	104	91	99	100	98	99	100	98	102
751.2	60	104	91	99	100	98	99	100	98	102
626	50	104	91	99	100	98	99	100	98	102
500.8	40	104	91	99	100	98	99	100	98	102
375.6	30	104	91	99	100	98	99	100	98	102
313	25	104	91	99	100	98	99	100	98	102
250.4	20	104	91	99	100	98	99	100	98	102
125.2	10	102	89	97	98	96	97	98	96	100

Performance Data

MECHANICAL Sound Data: 22.97 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
1,252	100	92	80	87	88	86	87	88	86	90
1,126.8	90	92	80	87	88	86	87	88	86	90
1,001.6	80	92	80	87	88	86	87	88	86	90
939	75	92	80	87	88	86	87	88	86	90
876.4	70	92	80	87	88	86	87	88	86	90
751.2	60	92	80	87	88	86	87	88	86	90
626	50	92	80	87	88	86	87	88	86	90
500.8	40	92	80	87	88	86	87	88	86	90
375.6	30	92	80	87	88	86	87	88	86	90
313	25	92	80	87	88	86	87	88	86	90
250.4	20	92	80	87	88	86	87	88	86	90
125.2	10	90	78	85	86	84	85	86	84	88

MECHANICAL Sound Data: 49.21 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	87	74	81	82	80	81	83	80	84
1,126.8	90	87	74	81	82	80	81	83	80	84
1,001.6	80	87	74	81	82	80	81	83	80	84
939	75	87	74	81	82	80	81	83	80	84
876.4	70	87	74	81	82	80	81	83	80	84
751.2	60	87	74	81	82	80	81	83	80	84
626	50	87	74	81	82	80	81	83	80	84
500.8	40	87	74	81	82	80	81	83	80	84
375.6	30	87	74	81	82	80	81	83	80	84
313	25	87	74	81	82	80	81	83	80	84
250.4	20	87	74	81	82	80	81	83	80	84
125.2	10	85	72	79	80	78	79	81	78	82

EMISSIONS DATA

Certification:

To properly apply this data you must refer to performance parameter DM1176 for additional information...

REFERENCE EXHAUST STACK DIAMETER	10 IN
WET EXHAUST MASS	16,179.7 LB/HR
WET EXHAUST FLOW (1,011.20 F STACK TEMP)	10,152.98 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,342.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,061.43 STD CFM
FUEL FLOW RATE	89 GAL/HR

Performance Data

RATED SPEED "Not to exceed data"

EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,252	100	1764	39.4400	10.8400	.5900	1.6000	9.4000	4.2000	1.4300
939	75	1583	34.9400	5.9000	1.0300	.8200	10.3000	2.9000	1.2600
626	50	1405	26.5400	4.0700	1.1000	.7200	11.5000	4.6000	1.4000
313	25	1316	13.1400	2.6300	.9300	.5300	11.7000	2.5000	1.2500
125.2	10	1227	4.8500	1.7500	.7800	.3000	10.5000	999,999.8750	.8500

RATED SPEED "Nominal Data"

EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,252	100	1764	32.8700	6.0200	.4400	1,928.4	1.1400	9.4000	4.2000	1.4300
939	75	1316	29.1200	3.2800	.7800	1,398.3	.5900	10.3000	2.9000	1.2600
626	50	875	22.1200	2.2600	.8300	1,027.8	.5100	11.5000	4.6000	1.4000
313	25	443	10.9500	1.4600	.7000	557.6	.3800	11.7000	2.5000	1.2500
125.2	10	179	4.0400	.9700	.5900	265	.2200	10.5000	999,999.8750	.8500

Performance Data

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp
984.25 F	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp
1,640.42 F	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,758.08 hp	1,800.99 hp
3,280.84 F	1,800.99 hp	1,800.99 hp	1,764.78 hp	1,708.46 hp	1,654.82 hp	1,800.99 hp
4,921.26 F	1,776.85 hp	1,716.51 hp	1,660.18 hp	1,606.54 hp	1,556.92 hp	1,712.48 hp
6,561.68 F	1,670.91 hp	1,613.25 hp	1,560.95 hp	1,511.33 hp	1,464.39 hp	1,628 hp
8,202.1 F	1,570.33 hp	1,516.69 hp	1,465.73 hp	1,418.8 hp	1,375.89 hp	1,547.54 hp
9,842.52 F	1,473.78 hp	1,424.16 hp	1,377.23 hp	1,332.97 hp	1,291.4 hp	1,468.42 hp
10,498.69 F	1,436.23 hp	1,387.96 hp	1,342.36 hp	1,299.45 hp	1,259.22 hp	1,438.91 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	7C5185	**Lube Oil Press @ Rated Spd(PSI):**	55.8
Effective Serial No:	24Z07877	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,244.1
Primary Engine Test Spec:	0T6106	**Max Operating Altitude(FT):**	3,274.3
Performance Parm Ref:	TM5738	**PEEC Elect Control Module Ref**	
Performance Data Ref:	TM3401	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:	TD3097	**Turbocharger Model**	TV9211-2.00VTF
Certification Ref:		**Fuel Injector**	1111775
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	13.0	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	180	**Unit Injector Timing (MM):**	86.9
Crankcase Blowby Rate(CFH):	907.6	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	8.1	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	**Peak Torque (LB/FT):**	--

Performance Data

Reference Number: TM3401

NOTE: ALSO USES ENGINE ARRANGEMENT 2W8405

Parameters Reference: TM5738

GEN SET - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER +/- 3%
EXHAUST STACK TEMPERATURE +/- 8%
GENERATOR POWER +/- 5%
INLET AIR FLOW +/- 5%
INTAKE MANIFOLD PRESSURE - GAGE +/- 10%
EXHAUST FLOW +/- 6%
SPECIFIC FUEL CONSUMPTION +/- 3%
FUEL RATE +/- 5%
HEAT REJECTION +/- 5%
HEAT REJECTION EXHAUST ONLY +/- 10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS
EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

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Appendix J

Toxic Air Pollutants

ON Semiconductor IDAPA 58.01.01.585 AND 586

Toxic Air Pollutants

Toxic Air Pollutants	CAS #	IDAPA 585 or 586 TAP	Source	Avg. Time	OEL or UR (mg/m³)	EL (lb/hr)	AAC (mg/m³)	AACC (µg/m³)
Molybdenum	7439-98-7	Yes	Boiler	24-hr	1.00E+01	6.67E-01	5.00E-01	
Manganese	7439-96-5	Yes	Boiler	24-hr	1.00E+00	6.70E-02	5.00E-02	
Pentane	109-66-0	Yes	Boiler	24-hr	1.77E+03	1.18E+02	8.85E+01	
Cobalt	7440-48-4	Yes	Boiler	24-hr	5.00E-02	3.30E-03	2.50E-03	
Chromium	7440-47-3	Yes	Boiler	24-hr	5.00E-01	3.30E-02	2.50E-02	
Zinc	7440-66-6	Yes	Boiler	24-hr	--	6.67E-01	5.00E-01	
Copper	7440-50-8	Yes	Boiler	24-hr	2.00E-01	1.30E-02	1.00E-02	
Mercury	7439-97-6	Yes	Boiler	24-hr	5.00E-02	3.00E-03	2.50E-03	
Barium	7440-39-3	Yes	Boiler	24-hr	5.00E-01	3.30E-02	2.50E-02	
Hexane	110-54-3	Yes	Boiler	24-hr	1.80E+02	1.20E+01	9.00E+00	
3-Methylcholanthrene	56-49-5	Yes	Boiler	Annual	2.70E-03	2.50E-06		3.70E-04
Nickel	7440-02-0	Yes	Boiler	Annual	2.40E-04	2.70E-05		4.20E-03
Arsenic	7440-38-2	Yes	Boiler	Annual	4.30E-03	1.50E-06		2.30E-04
Cadmium	7440-43-9	Yes	Boiler	Annual	1.80E-03	3.70E-06		5.60E-04
Toluene	108-88-3	Yes	Boiler & EG	24-hr	3.75E+02	2.50E+01	1.88E+01	
Naphthalene	91-20-3	Yes	Boiler & EG	24-hr	5.00E+01	3.33E+00	2.50E+00	
Benzo(a)pyrene	50-32-8	Yes	Boiler & EG	Annual	3.30E-03	2.00E-06		3.00E-04
Benzene	71-43-2	Yes	Boiler & EG	Annual	8.30E-06	8.00E-04		1.20E-01
Formaldehyde	50-00-0	Yes	Boiler & EG	Annual	1.30E-05	5.10E-04		7.70E-02
1,1-Dichloroethane	75-34-3	Yes	EG	24-hr	4.05E+02	2.70E+01	2.03E+01	
Chlorobenzene	108-90-7	Yes	EG	24-hr	3.50E+02	2.33E+01	1.75E+01	
1,2-Dichloropropane	78-87-5	Yes	EG	24-hr	3.47E+02	2.31E+01	1.74E+01	
1.2-Dichloroethane	107-06-2	Yes	EG	24-hr	4.00E+01	2.67E+00	2.00E+00	
Styrene	100-42-5	Yes	EG	24-hr	--	6.67E+00	1.00E+00	
Xylene	1330-20-7	Yes	EG	24-hr	4.35E+02	2.90E+01	2.18E+01	
Methanol	67-56-1	Yes	EG	24-hr	2.60E+02	1.73E+01	1.30E+01	
Vinyl Chloride	75-01-4	Yes	EG	Annual	7.10E-06	9.40E-04		1.40E-01
Methylene Chloride	75-09-2	Yes	EG	Annual	4.10E-06	1.60E-03		2.40E-01
1,1,2-Trichloroethane	79-00-5	Yes	EG	Annual	1.60E-05	4.20E-04		6.20E-02
Carbon Tetrachloride	56-23-5	Yes	EG	Annual	1.50E+05	4.40E-04		6.70E-02
Chloroform	67-66-3	Yes	EG	Annual	2.30E-05	2.80E-04		4.30E-02
1,1,2,2-Tetrachloroethane	79-34-5	Yes	EG	Annual	5.80E-05	1.10E-05		1.70E-02
Ethylene Dibromide	106-93-4	Yes	EG	Annual	2.20E-04	3.00E-05		4.50E-03
Acrolein	107-02-8	Yes	EG	24-hr	2.50E-01	1.70E-02	1.25E-02	
Acetaldehyde	75-07-0	Yes	EG	Annual	2.20E-06	3.00E-03		4.50E-01
PAH	NA	Yes	EG	Annual	7.30E-05	9.10E-05		1.40E-02
1,3-Butadiene	106-99-0	Yes	EG	Annual	2.80E-04	2.40E-05		3.60E-03

Toxic Air Pollutants	CAS #	IDAPA 585 or 586 TAP	Source	Avg. Time	OEL or UR (mg/m³)	EL (lb/hr)	AAC (mg/m³)	AACC (µg/m³)
1,3-Dichloropropene	542-75-6	Yes	EG	Annual	3.50E-01	1.90E-07		2.90E-06
2-pentanone	107-87-9	Yes	Facility	24-hr	7.00E+02	4.67E+01	3.50E+01	
Chlorine	7782-50-5	Yes	Facility	24-hr	3.00E+00	2.00E-01	1.50E-01	
Ethlyene glycol	107-21-1	Yes	Facility	24-hr	127.00	0.85	6.35	
Phosphorus oxychloride	10025-87-3	Yes	Facility	24-hr	6.00E-01	4.00E-02	3.00E-02	
Potassium Hydroxide	1310-58-3	Yes	Facility	24-hr	2.00E+00	1.33E-01	1.00E-01	
Silica, amorphous	112926-00-8	Yes	Facility	24-hr	1.00E+01	6.67E-01	5.00E-01	
ethyl alcohol	64-17-5	Yes	Facility	24-hr	1.88E+03	1.25E+02	9.40E+01	
N-Amyl Acetate	628-63-7	Yes	Facility	24-hr	5.30E+02	3.53E+01	2.65E+01	
Magnesium Hydroxide	546-93-0	Yes	Facility	24-hr	1.00E+01	6.67E-01	5.00E-01	
Boron trifloride	7637-07-2	Yes	Facility	24-hr	3.00E+00	2.00E-01	2.50E-01	
n-butyl alcohol	71-36-3	Yes	Facility	24-hr	1.50E+02	1.00E+01	7.50E+00	
n-butyl acetate	123-86-4	Yes	Facility	24-hr	7.10E+02	4.73E+01	3.55E+01	
Cresol	1319-77-3	Yes	Facility	24-hr	2.20E+01	1.47E+00	1.10E+00	
1-Methoxy-2-propanol	107-98-2	Yes	Facility	24-hr	3.60E+02	2.40E+01	1.80E+01	
Silicon Dioxide	14808-60-7	Yes	Facility	24-hr	1.00E-01	6.70E-03	5.00E-03	
Nitrogen Trifluoride	7783-54-2	Yes	Facility	24-hr	2.90E+01	1.93E+00	1.45E+00	
Sodium Metabisulfite	7681-57-4	Yes	Facility	24-hr	5.00E+00	3.33E-01	2.50E-01	
propylene glycol monomethyl ether acetate	108-65-6	Yes	Facility	24-hr	NA	2.40E+01	3.60E+00	
Isopropanol	67-63-0	Yes	Facility	24-hr	9.80E+02	6.53E+01	4.90E+01	
Nitrous oxide	10024-97-2	Yes	Facility	24-hr	9.00E+01	6.00E+00	4.50E+00	
Hydrogen Bromide	10035-10-6	Yes	Facility	24-hr	1.00E+01	6.67E-02	5.00E-01	
Acetone	67-64-1	Yes	Facility	24-hr	1.78E+03	1.19E+02	8.90E+01	
2-Heptanone	110-43-0	Yes	Facility	24-hr	2.35E+02	1.57E+01	1.18E+01	
4-methyl 2-pentanone	108-10-1	Yes	Facility	24-hr	2.05E+02	1.37E+01	1.03E+01	
Phosphine	7803-51-2	Yes	Facility	24-hr	4.00E-01	2.70E-02	2.00E-02	
Sodium Hydoxide	1310-73-2	Yes	Facility	24-hr	2.00E+00	1.33E-01	1.00E-01	
Arsine	7784-42-1	Yes	Facility	24-hr	2.00E-01	1.30E-02	1.00E-02	
Tetraethylorthosilicate	78-10-4	Yes	Facility	24-hr	8.50E+01	5.67E+00	4.25E+00	
Silicon tetrahydride	7803-62-5	Yes	Facility	24-hr	7.00E+00	4.67E-01	3.50E-01	
Calcium Hydroxide	1305-62-0	Yes	Facility	24-hr	5.00E+00	3.33E-01	2.50E-01	
Acetic Acid	64-19-7	Yes	Facility	24-hr	2.50E+01	1.67E+00	1.25E+00	
Hydrogen Chloride	7647-01-0	Yes	Facility	24-hr	7.50E+00	5.00E-02	3.75E-01	
Ammonia	7664-41-7	Yes	Facility	24-hr	1.80E+01	1.20E+00	9.00E-01	
Catechol	120-80-9	Yes	Facility	24-hr	2.00E+01	1.33E+00	1.00E-01	
Nitric Acid	7697-37-2	Yes	Facility	24-hr	5.00E+00	3.33E-01	2.50E-01	
Phosphoric acid	7664-38-2	Yes	Facility	24-hr	1.00E+00	6.70E-02	5.00E-02	
Hydrogen Peroxide	7722-84-1	Yes	Facility	24-hr	1.50E+00	1.00E-01	7.50E-02	
Sulfuric acid	7664-93-9	Yes	Facility	24-hr	1.00E+00	6.70E-02	5.00E-02	

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Material Safety Data Sheets

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Acetylene
Ammonia
Ammonium Fluoride
Ammonium Hydroxide
Anhydrous Ammonia
Argon
Argon helium gas mixture
Argon Liquid
Arsine balance Hydrogen
Arsine, SDS
AZ P4620 Photoresist
Boiler Water Scale Control (BTW-180)
Boron Trichloride
Boron Trifluoride
Bromine – StaBrEx
Calcium Carbonate
Carbon Dioxide
Caustic Soda
Chlorine
Chloroform
Closed System Corrosion Inhibitor (CSC-402)
Cooling Tower Scale Control (CWT-271)
Defreckle Etch
Diatomaceous Earth
Dichlorosilane
EKC 265
Ethyl Lactate
Ethylene Glycol
Filter Powder
Flocculant - Nalclear (Polyfloc)
Freon (Halocarbon) 116
Freon (Halocarbon) 14
Freon (Halocarbon) 23
Freon (Halocarbon) 4110
FSC-L Photoresist
FSC-M Photoresist
Helium (99.5%) balance oxygen
Helium balance Argon
Helium
Helium balance Oxygen
Helium
HMDS
Hydrochloric Acid
Hydrofluoric Acid
Hydrogen Bromide
Hydrogen Chloride
Hydrogen Peroxide
Hydrogen
Hypersperse
Isopropyl Alcohol
Krytox Vacuum Pump Fluid
LDD-26-W Microposit Developer
Lime
Liquid Nitrogen
Lithium Hypochlorite
Megaposit SPR 3012 Resist
Megaposit SPR 518 L-A Photoresist
Methane
Nitric Acid
Nitric Oxide
Nitrogen
Nitrogen Hydrogen gas mixture
Nitrogen Trifluoride
Nitrous Oxide
NMD-W Developer
N-Methyl Pyrrolidinone (NMP)
NMP-2P
Oxygen
PGMEA

Phosphine
Phosphine Bal Hydrogen
Phosphoric Acid
POCL3
Polyimide 115A
Polyimide AP2210
RER 550
Silane
Slurry silica colloidal
Slurry W2000 aqueous
Sodium Hydroxide Pellets
Sodium Metabisulfite
Sulfite Oxygen Scavenger (BTW-113)
Sulfur Hexafluoride
Sulfuric Acid
Surf etch
SWK T5 D60
TEB 12000 gm
TEOS 18000 gm
TEOS 17400 gm
TEPO 12000 gm
Tetramethylammonium Hydroxide (TMAH)
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THMRiP 3150LB 22cp
THMR-iP 5700 Hp 14 cp
THMRiP3450HP 8cp
THMRiP9650HL 5cp
TMB
TMP
TSMR CR50i-15 30cps
Tungsten Hexafluoride
Ultra-I 123
Vacuum Pump Scale Control (CSC-302)

ON SEMICONDUCTOR, INC.

Modeling Report

Permit-to-Construct
Air Quality Operating Permit Application

For the facility located at:

2300 Buckskin Road
Pocatello, Idaho 83201

For submission to:

Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83201

August 2012

Permit-to-Construct
Air Quality Operating Permit Application

Modeling Report

ON Semiconductor, Inc.
2300 Buckskin Road
Pocatello, Idaho 83201

August 2012

Prepared for: ON Semiconductor, Inc.
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ACRONYMS

2SLB	2 Stroke Lean Burn
4SLB	4 Stroke Lean Burn
4SRB	4 Stroke Rich Burn
AAC	acceptable ambient concentration
AACC	acceptable ambient concentration for carcinogens
ACC	acceptable ambient concentration
ABOI	Boiler, Building A
ASTM	American Society for Testing and Materials
BAAQM	Bay Area Quality Management
BAAQM	Bay Area Quality Management District
n-BAct	N-Butyl Acetate
BCE	bag house control equipment
BCL	Boron Chloride
BF^3	Boron Triflouride
bld	building
bph	brake horsepower
BPIP	Building Profile Input Program
CaF	calcium fluoride
CEMS	Continuous Emissions Monitoring System
cf	cubic feet
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
COMS	Continuous Opacity Monitoring Systems
CPMS	Continuous Parameter Monitoring System
DEQ	U.S. Department of Environmental Quality
dscfm	dry standard cubic feet per minute
EL	emissions level
EF	emission factor
EPA	U.S. Environmental Protection Agency
ERC	Engineer Research Center

EU1	Emissions Units – Industrial Engine Information
EU5	Emissions Unit – Industrial Boiler Information
EUH	Emissions Units – Cooling Towers Information
EUO	Emissions Unit – General
FAB	fabrication
FAHS	Federal Aid Highway System
FEC	Facility Emissions Cap
ft	feet
gal	gallon
GCT1	Cooling Tower 1, Building G
GCT2	Cooling Tower 2, Building G
GEP	Good Engineering Practice
GI	General Information
gph	gallons per hour
gr/dscf	grains per dry strand cubic foot
HAPs	hazardous air pollutants
HCI	hydrogen chloride
HF	hydrogen fluoride
hp	horse power
hr	hour
ICE	Internal Combustion Engines
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
KOH	Potassium Hydroxide
kw	kilowatt
lb	pound
lbs	pounds
LHV	low heating value
LPG	liquefied petroleum gas
m	meters
MI1	Modeling Information – Impact Analysis
MI4	Modeling Information – Building and Structures
MACT	Maximum Available Control Technology

mg	milligram
mmBtu/hr	million British thermal units per hour
MSDS	Material Safety Data Sheet
mw	megawatts
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NOV	notice of violation
NFPA	National Fire Protection Association
NSCR	non-selective catalytic reduction
NSPS	New Source Performance Standards
NSR	New Source Review
O_2	oxygen
OLM	ozone limiting method
ON	On Semiconductor facility
PM	particulate matter
$PM_{2.5}$	fine particulate matter 2.5 µm in diameter or less
PM_{10}	fine particulate matter 10 µm in diameter or less
POU	point of use
ppm	parts per million
ppmV	parts per million volume
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
PTC	permit to construct
PTE	potential to emit
PTFE	polytetrafluoroethylene
RICE	reciprocating internal combustion engines
SCE	Scrubber Control Equipment
SCFH	standard cubic feet per hour
SI	spark ignition
SIP	State Implementation Plan

SO_2	sulfur dioxide
SO_x	sulfur oxide
TAP	toxic air pollutant
TBD	to be determined
TDS	total dissolved solids
tpy	tons per year
T-RACT	Toxic-Reasonable Available Control Technology
µg	microgram
UTM	Universal Transverse Mercator
VOC	volatile organic compound
wt	weight
yr	year

ON Semiconductor, Inc.
2300 Buckskin Road
Pocatello, Idaho 83201

1.0 PURPOSE

The purpose of this modeling report is to support a voluntary application for a *Permit-to-Construct Operating Permit* (PTC) in accordance with Idaho Air Quality Rules.[1] In accordance with IDAPA 58.01.01.176.01, ON Semiconductor (ON) is requesting to establish a Facility Emissions Cap (FEC) in an effort to remain competitive in a fast paced industry. Semiconductor industry manufacturing processes require frequent revision because of the rapid and frequent changes necessary to keep up with evolving technology developments and a FEC on criteria and hazardous air pollutants (HAPs) will allow ON the flexibility to adapt to market changes.

Air quality modeling was performed to demonstrate compliance and to estimate the effects of emissions of all criteria air pollutants and toxic air pollutants (TAPs). This modeling report demonstrates ON Semiconductor's compliance with the National Ambient Air Quality Standards (NAAQS)[2] and TAP[3] requirements as required by the State of Idaho for a minor new or modified source Permit-to-Construct application. A cumulative NAAQS analysis was conducted to show that the ON facility is compliant for criteria air pollutants. For TAPs that exceeded their respective emission limits (EL), modeling determined the controlled ambient concentration at the point of compliance was below their applicable acceptable ambient concentrations in IDAPA 58.01.01.585 and 586.

2.0 MODEL SELECTION AND JUSTIFICATION

The model chosen to perform air dispersion calculations is AERMOD (EPA 2004), one of the codes preferred by the U. S. Environmental Protection agency (EPA) in their *Guideline on Air Quality Models,* which is published as Appendix W to 40 CFR Part 51.[4] The model was selected after discussions with Kevin Schilling, Stationary Source Air Modeling Coordinator for the State of Idaho Department of Environmental Quality (IDEQ), who stated that this is the model preferred by IDEQ.[5]

AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. There are two input data processors that are regulatory components of the AERMOD modeling system: AERMET, a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence

[1] Idaho Department of Environmental Quality, *Rules For the Control Of Air Pollution in Idaho*, IDAPA 58 Title 01, Chapter 01, Section 200.
[2] IDAPA Section 203.02.
[3] IDAPA Section 203.03.
[4] EPA, 2005. *Guideline on Air Quality Models.* 40 CFR Part 51, Appendix W, Federal Register Vol. 70, No. 216, Wednesday, November 9, 2005.
[5] Telephone conversation with Marilyn Case on December 16, 2008.

structure and scaling concepts, and AERMAP, a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data. Other non-regulatory components of this system include: AERSCREEN, a screening version of AERMOD; AERSURFACE, a surface characteristics preprocessor, and BIPPRIME, a multi-building dimensions program incorporating the Good Engineering Practice (GEP) technical procedures for PRIME applications.

AERMOD was purchased from Lakes Environmental Software to serve as a user-friendly interface for the AERMOD model. AERMOD View Version 7.0.3 was used to model the scenarios used for this application.

3.0 EMISSION AND SOURCE DATA

3.1 Emission Data

The emission data are based on 2007 facility-wide emissions from the operation of semiconductor production processes, general facility operations, boilers, and emergency generators. A detailed description of how emission rates were generated is provided in the ON Semiconductor PTC Application, Appendix F.

3.1.1 Facility Emissions Cap

As part of the PTC application, ON is requesting a Facility Emissions Cap (FEC) on criteria pollutants, hazardous air pollutants (HAP) and volatile organic compounds (VOC).
Table 1 presents the FEC emissions from the ON facility. The FEC quantities were evaluated in the air modeling to ensure compliance.

Table 1. Criteria and Hazardous Pollutant Proposed FEC

FEC Components	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$	VOCs	HAPs
	Tons/yr	Tons/yr	Tons/yr	Tons/yr	Tons/yr	Tons/yr	Tons/yr
Baseline	30.14	30.20	0.21	12.66	2.66	17.26	3.49
Operational Variability	--	--	--	1.18	--	12.09	2.25
Proposed Growth Component	5.39	9.06	0.07	5.51	0.82	6.05	1.22
Facility Emissions Cap (FEC)	35.53	39.26	0.28	19.35	3.48	35.40	6.97

ON is not requesting the maximum operational variability for any of the criteria pollutants (i.e. up to 1 ton per year less than the significant emission rate).

3.1.2 Criteria Pollutants

Table 2 presents hourly and annual criteria pollutant emission rates for each emission source (that emits a criteria pollutant) for each specific averaging time. Since ON Semiconductor is an existing facility requesting a FEC, the potential to emit (PTE) includes actual emission rates and future allowable emissions rates (maximum for each applicable averaging period). An emission increase (future allowable minus actual or current allowable) is not being established as this will be ONs first permit.

Table 2. Point Source Emission Rates

Emission Unit	Stack ID	PM_{10}	$PM_{2.5}$		SO_2		NOx		CO		Lead	
		24-Hour Averaging Period	24-Hour Averaging Period	Annual Averaging Period	1-Hour Averaging Period	3-Hour Averaging Period	1-Hour Averaging Period	Annual Averaging Period	1-Hour Averaging Period	8-Hour Averaging Period	Monthly Averaging Period	Quarterly Averaging Period
		lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr
ABOI	ABOI	--	6.65E-03	6.65E-03	5.25E-04	5.25E-04	8.75E-02	8.75E-02	7.35E-02	7.35E-02	--	--
BBOIHWB	BBOIHWB	--	6.55E-02	6.55E-02	5.17E-03	5.17E-03	8.61E-01	8.61E-01	7.24E-01	7.24E-01	--	--
BBOIST	BBOIST	--	5.73E-02	5.73E-02	4.52E-03	4.52E-03	7.54E-01	7.54E-01	6.33E-01	6.33E-01	--	--
CBOIHWB	CBOIHWB	--	6.55E-02	6.55E-02	5.17E-03	5.17E-03	8.61E-01	8.61E-01	7.24E-01	7.24E-01	--	--
DBOIHWB	DBOIHWB	--	6.55E-02	6.55E-02	5.17E-03	5.17E-03	8.61E-01	8.61E-01	7.24E-01	7.24E-01	--	--
DBOIST1	DBOIST1	--	4.09E-02	4.09E-02	3.23E-03	3.23E-03	5.38E-01	5.38E-01	4.52E-01	4.52E-01	--	--
GBOIHWE	GBOIHWE	--	1.12E-02	1.12E-02	8.86E-04	8.86E-04	1.48E-01	1.48E-01	1.24E-01	1.24E-01	--	--
GBOISB1	GBOISB1	--	1.61E-01	1.61E-01	1.27E-02	1.27E-02	1.06E+00	1.06E+00	1.77E+00	1.77E+00	--	--
GBOISB2	GBOISB2	--	1.61E-01	1.61E-01	1.27E-02	1.27E-02	1.06E+00	1.06E+00	1.77E+00	1.77E+00	--	--
GBOISB3	GBOISB3	--	1.61E-01	1.61E-01	1.27E-02	1.27E-02	1.06E+00	1.06E+00	1.77E+00	1.77E+00	--	--
BEMGEN	BEMGEN	--	1.03E-04	2.82E-05	1.53E-04	5.10E-05	5.75E-01	6.56E-03	9.68E-01	1.21E-01	--	--
CEMGENR	CEMGENR	--	1.03E-04	2.82E-05	1.53E-04	5.10E-05	5.75E-01	6.56E-03	9.68E-01	1.21E-01	--	--
CEMGENS	CEMGENS	2.38E-02	--	--	9.53E-03	3.18E-03	2.39E+01	2.73E-01	3.01E+00	3.76E-01	--	--
DEMGEN	DEMGEN	--	2.42E-04	6.64E-05	3.60E-04	1.20E-04	1.35E+00	1.54E-02	2.28E+00	2.85E-01	--	--
DMREMGEN	DMREMGEN	--	3.88E-04	1.06E-04	5.76E-04	1.92E-04	2.22E+00	2.54E-02	3.44E+00	4.30E-01	--	--
GEEMGEN	GEEMGEN	3.00E-02	--	--	9.08E-03	3.03E-03	2.65E+01	3.03E-01	4.07E+00	5.09E-01	--	--
GOEMGEN	GOEMGEN	1.79E-02	--	--	1.31E-02	4.38E-03	1.77E+01	2.02E-01	1.37E+00	1.71E-01	--	--
FAB 9 & FAB 10	HSCRUB7F2	--	--	--	--	--	--	--	--	--	--	--
FSCRUB1	FSCRUB1	1.22E-01	--	--	--	--	--	--	--	--		
LS	LS	2.53E-02	--	--	--	--	--	--	--	--	--	--
BCT1	BCT1	3.54E-01	--	--	--	--	--	--	--	--	--	--
BCT2	BCT2	1.62E-01	--	--	--	--	--	--	--	--	--	--
CCT1	CCT1	3.03E-01	--	--	--	--	--	--	--	--	--	--
CCT2	CCT2	3.03E-01	--	--	--	--	--	--	--	--	--	--
DCT1	DCT1	3.38E-01	--	--	--	--	--	--	--	--	--	--
DCT2	DCT2	3.38E-01	--	--	--	--	--	--	--	--	--	--
GCT1	GCT1	1.14E+00	--	--	--	--	--	--	--	--	--	--
GCT2	GCT2	1.14E+00	--	--	--	--	--	--	--	--	--	--

[a] lbs/hr = Pounds per hour

3.1.3 TAPs

Table 3 provides the PTE TAPs that exceed the screening emission limit (EL) for process and facility activities and fuel burning equipment.

Table 3. Toxic Air Pollutant Emission Rates

Toxic Air Pollutants	CAS #	Baseline (lb/hr) [a]	Projected growth[b]	PTE[c] (lb/hr)	IDAPA EL[d] (lb/hr)	PTE % of EL
Combustion Equipment[e]						
1,3-Dichloropropene	542-75-6	3.06E-07	NA	3.06E-07	1.90E-07	161%
Nickel	7440-02-0	1.68E-04	5.17E-05	2.19E-04	2.70E-05	813%
Arsenic	7440-38-2	1.60E-05	4.92E-06	2.09E-05	1.50E-06	1393%
Formaldehyde	50-00-0	6.50E-03	1.85E-03	8.35E-03	5.10E-04	1637%
Cadmium	7440-43-9	8.79E-05	2.71E-05	1.15E-04	3.70E-06	3107%
Facility/Semiconductor Process[f]						
Hydrogen Chloride	7647-01-0	6.51E-02	5.19E-02	1.17E-01	5.00E-02	234%
Silicon Dioxide	14808-60-7	9.30E-03	7.41E-03	1.67E-02	6.70E-03	249%
Phosphoric acid	7664-38-2	1.67E-01	1.34E-01	3.01E-01	6.70E-02	449%
Hydrogen Peroxide	7722-84-1	3.03E-01	2.41E-01	5.44E-01	1.00E-01	544%
Sulfuric acid	7664-93-9	7.32E-01	5.83E-01	1.32E+00	6.70E-02	1963%

a. Pounds per hour
b. Projected growth emissions for the combustion equipment are based on two future potential boilers. Projected growth for the process emissions are based on increasing baseline emissions by 180%.
c. Sum of baseline and projected growth emissions
d. IDAPA Section 585 and 586
e. Combustion Equipment PTE emissions include inputs from the Boilers and Emergency Generators.
f. The Facility PTE emissions include Fab 9, Fab 10, and Waste Water Treatment activities. All facility TAPs that exceed the EL are non-carcinogenic.

Projected growth is included in the PTE emission rate, which is used in the air dispersion modeling analysis, providing a conservative approach for evaluating TAP emissions including both baseline and potential emission increases.

3.1.4 Inconsequential Sources

The ON facility plant upkeep does include some painting activities. The majority of painting activities are completed using spray cans. These painting activities do not require controls and their impact is not included in the modeling analysis. An analysis of paint usage conducted in 2002 showed that VOC and HAP emissions only contributed 0.08% and 0.11% to the annual PTE, respectively. Since VOC and HAP emissions are regulated on an annual basis, only the total annual paint usage was compared to facility emission rates. The individual TAPs associated with the painting activities did not exceed their respective EL's. This analysis was conducted based on a total of 40 hours per year spent on painting activities with 2 hours of continuous painting activity per twenty-four hours.

3.1.5 Fugitive Emissions

A chemical mass balance was used for estimating fabrication (FAB) and process emissions. This method is inclusive of all emissions. Any potential fugitive emissions that may occur in the FAB or facility are encompassed through the use of the mass balance method.

3.2 *Source Data*

Emission release parameters for all sources are provided in Appendices A, B, C. Stoller has developed model point source parameters and layout information from data and drawings supplied by and verified by ON facility staff. The sources are identified in the model as *bsource*, where *b* is the building letter (from A to H), and *source* describes the source (BOI for boiler, HW indicating hot water, ST or SB for steam boiler, EMGEN for emergency generators, SCRUB for scrubber, EXHF for exhaust fan, SEXHF for solvent exhaust fan, and CT for cooling tower). An additional directional letter or sequence number may be included in the identifier to distinguish multiple sources associated with the same building.

3.2.1 Sources

ON's significant fuel burning emission sources are listed in Appendix D. The combustion sources include 10 natural gas fired boilers, primarily producing steam or hot water, and seven emergency generators, three of which are diesel-fired. Fuel burning sources that fall well below exemption standards are not listed in the appendix. These include three domestic-sized natural gas water heaters in Buildings B, C and E, eleven natural gas space heaters, and 4 air handling units located in small support buildings throughout the facility. Section 4.0 describes how these small sources are accounted for in the modeling.

Semiconductor manufacturing operations occur in two main FAB areas, FAB 9 and FAB 10. There are 25 process and scrubber exhausts from the FAB 9 and 10 sources. These include the support operations from the wastewater treatment process and lime silo. Appendix E provides details on the facility scrubbers. In addition, there are 8 cooling towers supporting general facility operation. Cooling tower source information is provided in Appendix F.

3.2.2 Universal Transverse Mercator (UTM) Coordinates

In all modeling analysis input and output data files, the locations of emission sources, structures, and receptors are represented in the Universal Transverse Mercator (UTM) coordinate system. The Pocatello area of southeast Idaho is located in UTM Zone 12 on the North American datum of 1927 (NAD 27). In each UTM Zone, coordinates are measured north and east in meters. The northing values are measured continuously from zero at the Equator, in a northerly direction. A central meridian through the middle of each 6° zone is assigned an easting value of 500,000 meters. Grid values to the east of this central meridian are greater than 500,000. ON Semiconductor is located near UTM coordinates 384.5 km East and 4,746 km North.

The emission point, buildings, and fence line locations were collected using a Global Positioning System (GPS) to define coordinate location. The data was collected in WGS84 format and was converted from latitude and longitude into NAD27 coordinates using ArcGIS. The stack location of each source is provided in Appendix G.

3.2.3 Stack Parameters

Some of the boiler stacks (ABOI, BBOIHWB, GBOIHWE, and GBOISB1, 2, and 3) and one of the emergency generators (CEMGENR) feature conical rain caps. The emergency generator BEMGEN does not have a cap but has a 90° bend at the end of the stack so that the exhaust is horizontal. The modeling analysis used the AERMOD beta option for capped and/or horizontal point source emissions, which was approved by IDEQ per the Modeling Protocol approval letter.[6] All other stacks are un-capped.

Stack diameter and height data were collected through direct measurement or from plant drawings. Plant drawings are updated with process additions or modifications and are an accurate representation of the process. Stack base elevations were determined per the methodology in Section 7.0 based on the stack UTM coordinates.

3.2.4 Stack Temperature and Flow Rate

The stack temperatures and velocities associated with each emissions source are shown in Appendix B. The majority of stack temperature and flow measurements are taken in accordance with ASHRAE 111, *Measurement, Testing, Adjusting and Balancing of Building HVAC Systems* on an annual basis. The flow and temperature measurements of each stack were taken on the roof, as near the exit of the stack as possible with the measurements being taken six duct diameters from the nearest elbow, constriction, or other change in the duct, when possible. This provides the most representative conditions for the temperature and flow at the stack exit. The duct diameter dictates the number of samples required for each exhaust duct measurement. The probe remains in the duct until the flow and temperature equalize. A VelociCalc Plus model 8386A is used to take the temperature and flow measurements of the exhaust streams.

Vendor data was used for cooling tower flows and temperatures. The temperatures for the cooling towers exhaust are assumed to be 65°F. The exhaust temperature cannot exceed the cooling tower hot water temperature, which is 95°F, but is variable based on ambient conditions. A temperature of 65°F was assumed as a reasonable, conservative exhaust temperature. The air flow through the cooling tower is set by the speed of the fan(s). The motors on the fan control the speed of the fan. Originally, each cooling tower had a two speed motor on each fan, with a low and high setting. These motors are currently being upgraded by ON with variable frequency speed drives (VFDs). The VFDs modulate the speed of the fan and therefore the air flow. The VFDs will allow a much lower air flow than the original two speed fans. To estimate the flow at the lower fan speeds, the maximum air flow provided by the vendor was reduced by 90%. This is equivalent to the VFD providing a 5-10 hertz frequency to the fan motor resulting in a reduction of fan speed by up to 12 times. Based on fan affinity laws, changes in fan speed are proportional to air flow. Therefore, the flow rate used during modeling is 10% of the vendor provided flowrate.

The lime silo baghouse flow is based on vendor data. The baghouse on the lime silo is only used when the lime silo is filled. This occurs quarterly and requires approximately an hour to fill. The stack exhaust flow is not measured because of the frequency and duration of operations.

[6] Facility ID No. 005-00017, ON Semiconductor, Inc. [formerly AMI Semiconductor, Inc.] Modeling Protocol Approval for the Initial FEC PTC for an Existing Manufacturing Facility, Revision 1

Flow through the baghouse is based on the delivery trucks blower size and how quickly the truck is emptied. Since this can vary significantly by delivery truck, the design value of the baghouse was used to set the exhaust flowrate. The exhaust from the lime silo baghouse is assumed to be ambient, 68°F, since the baghouse exhaust is the pneumatic air used to supply lime to the silo.

The emergency generators are only operated once per week for up to a half hour for maintenance purposes, so exhaust sampling is not conducted on these source stacks. All of the emergency generators, natural gas and diesel, are operated at no load conditions during testing. The natural gas emergency generators; BEMGEN, CEMGENR, DEMGEN, and DMREMGEN flow and temperature data are based on vendor data at 100% loading, which corresponds to the maximum fuel usage. Vendor data for exhaust flow and temperature is not available at other load ratings for the natural gas emergency generators so the maximum flowrate and temperature were used. Only one natural gas generator, DEMGEN, has a velocity slightly over 50 meters per second based on stack conditions at 100% loading. ON Semiconductor has already increased the diameter of the stack for this generator above the engine exhaust port in order to decrease the velocity but the velocity is still above 50 meters per second. As discussed below, the sensitivity analysis conducted on hourly nitrogen dioxide (NO_2) emissions shows that the natural gas emergency generators have little effect on the emission concentration profile.

The diesel generators; CEMGENS, GEEMGEN, and GOEMGEN have emissions testing reports for each generator. These reports provide flowrate and temperature data at multiple generator loadings. For the diesel generators, the exhaust flowrate and temperature at 50% loading were used for modeling purposes. For GOEMGEN, the exhaust routing is different than the other diesel emergency generators. GOEMGEN engine exhaust and fan exhaust are routed through the same exhaust opening. This accounts for a much higher flow rate however, the exhaust opening is very large and the exhaust velocity is only 6.8 meters per second.

Multiple hourly NO_2 modeling scenarios were run to evaluate the sensitivity of the combustion equipment on the hourly NO_2 concentration. In every case, the diesel generators or boilers dominated the concentration profile. The different scenarios consisted of setting the diesel generator temperature, flow rate and emissions at 10%, 50%, 75% and 100% loading values. The diesel generators dominated the concentration profile when the values at 50%, 75% and 100% loading were used. For the 10% diesel generator loading, corresponding to lowest emissions, exhaust flows and temperatures; the boilers dominated the concentration profile. Multiple loading data is not available for the natural gas generators. To determine the concentration profiles sensitivity to changes in the natural gas generators exhaust flow and temperature, the natural gas generators flows were reduced by 50% and their temperatures by 25% and leaving the emission rates at 100%. At these conditions, there was essentially no change in the maximum concentration for NO_2. Setting the diesel emergency generators stack parameters at 50% loading values and the natural gas emergency generators at 100% loading values provided a very conservative value for the hourly NO_2 concentration.

3.2.5 Good Engineering Practice Stack-Height Analysis

An analysis of the Good Engineering Practice stack height for all the ON Semiconductor emissions sources was conducted. The building profile input program (BPIP) was used to determine the buildings affecting or contributing to the stacks GEP calculation. For all stacks,

the actual stack height is less than the calculated GEP stack height; therefore the actual stack heights are used in the dispersion modeling analysis. Appendix C presents the GEP analysis data.

4.0 AIR QUALITY MODELING METHODOLOGY

All criteria pollutant and TAP emissions from each ON facility building and source were modeled, except SO_2 and lead (see Section 11.1). The criteria pollutant emissions are derived from stack releases from 17 combustion sources with additional particulate matter (PM_{10} and $PM_{2.5}$) emissions from the waste water treatment scrubber, lime silo baghouse, and 8 cooling towers. The combustion sources include 10 natural gas fired boilers, primarily producing steam or hot water, and seven emergency generators, three of which are diesel-fired. TAPs are emitted from the boilers, emergency generators, and 25 process and scrubber exhausts from FABs 9 and 10. TAPs will be modeled from the selected worse-case FAB stack and the individual combustion source stacks.

Three separate scenarios were modeled for the ON emissions: the primary scenario, the single stack scenario, and the hourly NO_2 scenario. The emission rates developed for the criteria pollutants, as presented in Section 2.0, were used as the PTE for the primary scenario. This analysis involved the release points and emission rates shown in Table 2. Emissions contributed from the numerous small natural gas space heaters are included in the modeling evaluation by increasing the total boiler combustion emissions by 5% at each stack. A unit release rate (1 g/s) was input into AERMOD for each averaging time and stack. Each result was then scaled by the fraction of the calculated concentration per unit release rate. The results were input into a Microsoft Access database designed for this project. The TAPs associated with fuel burning equipment were modeled the same as the criteria pollutants, since these emissions are traceable to their respective stacks.

The single stack scenario was used to model the semiconductor process TAPs sources as a single point release since emissions of TAPs related to the FABs cannot be associated with a specific exhaust or scrubber. The location of the single worse-case TAPs stack was identified using the following approach: 1) a screening run on all scrubber and exhaust stacks associated with the FABs (i.e., Buildings C, D, and H) modeled for a single year; 2) the worse-case stack resulting in the highest receptor concentration was be selected; and 3) model all process TAP emissions over five years unit releases for the worse-case stack. The worse-case stack resulting in the highest receptor concentration is HSCRUB7F2. The results were input into a Microsoft Access database designed for this project. The emissions included in the TAP modeling analysis are described in Section 2.0.

The hourly NO_2 was modeled separately because of the complexity of the nitrogen oxides (NO_x) to NO_2 conversion modeling used in the AERMOD code. The Ozone Limiting Method (OLM) for the conversion of NO_x to NO_2 was used with the following model inputs:

- **Default in-stack NO_2/NO_x ratio:** A default value of 0.10 (10%) was used for the boilers and a default value of 0.2 (20%) was used for the diesel generators. These ratios were obtained from a table developed by the San Joaquin Air Pollution Control District, which can be downloaded from http://www.valleyair.org/busind/pto/Tox_Resources/AssessmentofNon-

RegulatoryOptioninAERMODAppendixC32111.xls. This resource was recommended by the IDEQ. [7]

- **NO_2/NO_x ambient equilibrium ratio:** A value of 0.80 (80%) was used, as recommended by IDEQ.[8]
- **Background NO_2 and ozone concentrations:** See Section 10.0 for a table of NO_2 hourly background data.

The hourly NO_2 scenario was modeled using PTE rates, hourly background NO_2 data, and specific operational schedules. The boilers were conservatively assumed to operate 24 hours a day, 365 days per year (8760 hours). The emergency generators operation was based on the following weekly testing and maintenance schedule:

Table 4. Emergency Generator Testing Schedule

Generator name	Day	Time	AERMOD hour[a]
BEMGEN	Monday	2:00 - 3:00 PM	15:00
CEMGENR	Sunday	2:00 - 3:00 PM	15:00
CEMGENS	Thursday	2:00 - 3:00 AM	03:00
DEMGEN	Saturday	1:00 - 2:00 PM	14:00
DMREMGEN	Friday	7:00 - 8:00 AM	08:00
GEEMGEN	Wednesday	1:00 - 2:00 PM	14:00
GOEMGEN	Tuesday	2:00 - 3:00 PM	15:00

a. AERMOD hour is the ending of the operating period.

The emergency generator maintenance tests are conducted for ~15 – 30 minutes; therefore the generators were modeled to emit NO_2 for one hour at one-half of the emission rate.

A description of how the emission rates were calculated, along with example calculations, is available in ON Semiconductor's PTC Application, Appendix F.

5.0 AMBIENT AIR BOUNDARY

The ambient air boundary for the ON Semiconductor facility is at the facility fence line. The north side and southwest side of the facility fence line are adjacent to a public roadway. 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. There is also a fence separating the ERC building from the rest of the facility. The layout of the ON Semiconductor facility, along with fence line locations, is provided in Appendix G.

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. There is no right-of-way access through the ON facility. ON does not lease any portion of its facility to another party.

[7] Cheryl Robinson to Joy Wilson and Krista Johnson, dated July 18, 2011 to an email from Joy Wilson of S.M. Stoller, (*Questions regarding letter dated June 2011)* sent on July 12, 2011

[8] Email from Cheryl Robinson to Krista Johnson, RE: *Facility ID No. 005-00017, ON Semiconductor, Inc. [formerly AMI Semiconductor, Inc.] Modeling Protocol Approval for the Initial FEC PTC for an Existing Manufacturing Facility, Revision 1,* sent on July 20, 2011. See Appendix I

6.0 RECEPTOR

Fenceline receptors were located at 15-m intervals out to 75 m beyond the boundary of the ON Semiconductor facility (Figure 1). The boundary was determined by walking around the perimeter with a Trimble GeoHX 6000 series GPS unit. This receptor layout is denser than proposed in the Modeling Protocol, which was every 25 meters up to 50 meters away from the air boundary. This was done to ensure the maximum modeled concentration was determined for demonstrating compliance. All modeled maximum concentrations occurred within 75-meters from the facility air boundary.

It was determined early in the modeling that the maximum concentrations occurred at or near the ONS facility boundary. For this reason, the boundary receptor grid resolution was investigated in more detail. First, receptors were located along the fence every 25 meters and out to 150 meters. To determine if this receptor grid would allow for determination of the maximum concentration, a second run was made using a 15-m boundary receptor grid which extends to 150 meters beyond the fence. The resulting concentration was approximately 4% larger than that calculated for the 25-m boundary grid. The resolution was tested further by placing the receptor locations every 10 meters along the boundary out to 20 meters to reduce calculation time. The maximum concentration predicted was 2$\mu g/m^3$ less than that predicted for the 15-m grid. For this reason, the boundary grid of 15 meters between receptors was selected for the final receptor density.

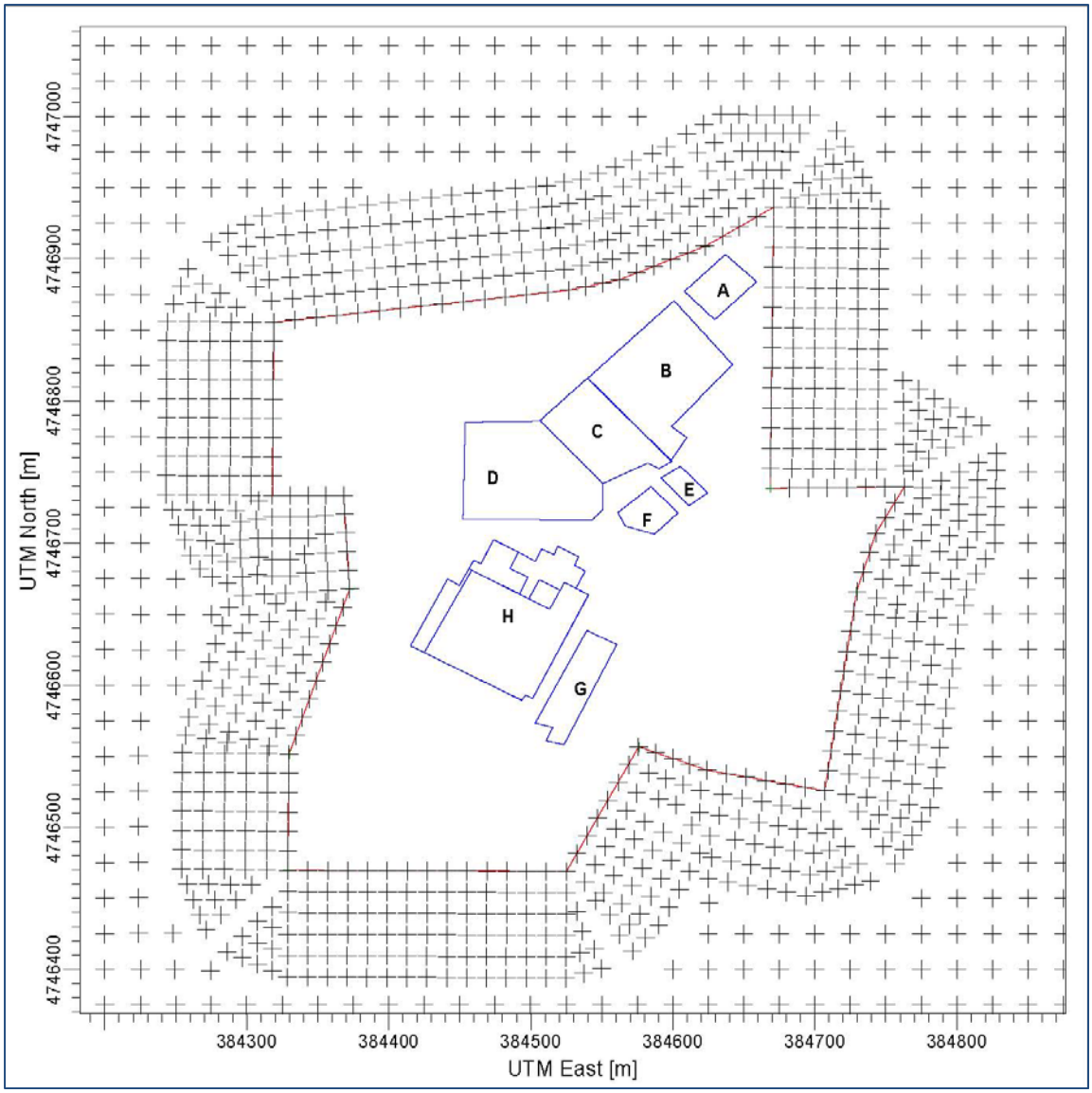

Figure 1. Fenceline Receptor Network, with Boundaries and Buildings

Receptors were located beyond the fenceline receptor network at 25-meter intervals for at least 125 meters and then at 50-meter intervals out to 250 m east, south, and west of the facility and 300 m north of the facility (Figure 2).

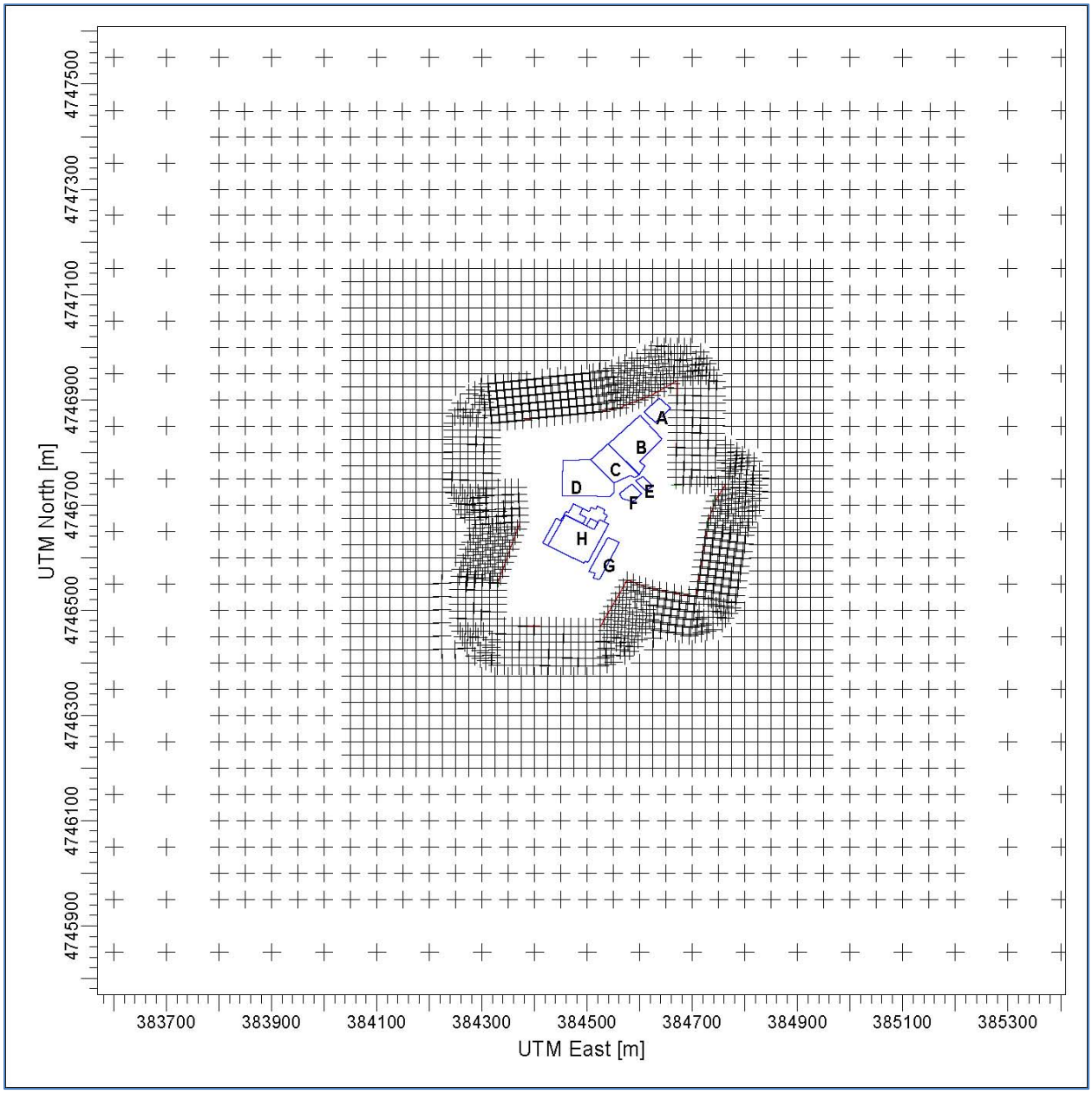

Figure 2. Inner Receptor Network, with Boundaries and Buildings

Moving further away, receptors were spaced at 250-m intervals for another 1750 meters (Figure 3). The entire receptor grid encompasses an area of 13 kilometers × 13 kilometers.

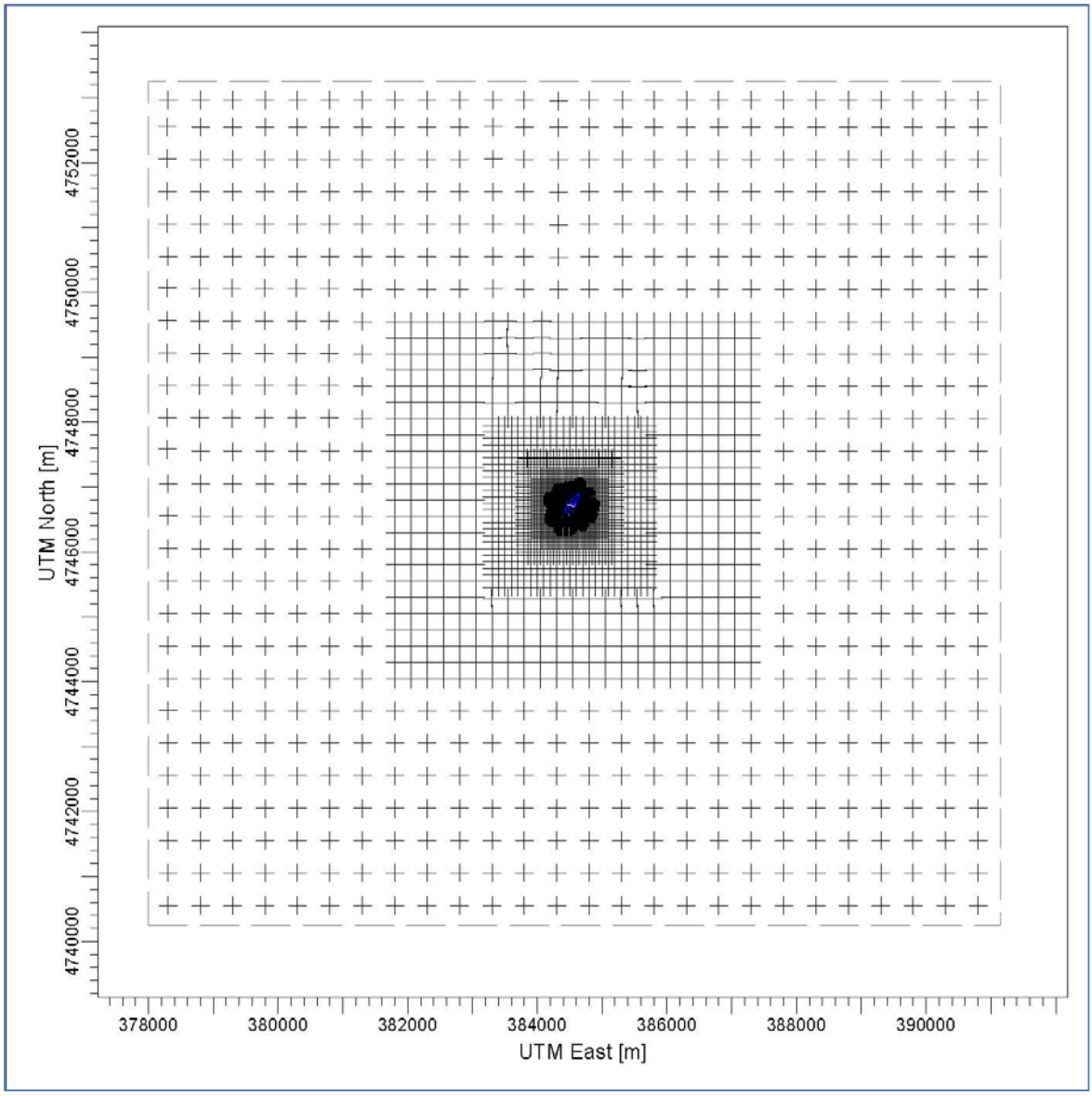

Figure 3. All Receptors Network.

7.0 ELEVATION DATA

All regional elevations were downloaded from USGS 7.5-degree (30m or less horizontal resolution) DEM data using the http://www.webgis.com/ website. Source and receptor elevations were developed from these data.

The terrain elevations of receptors at the locations described above have been determined using the AERMAP terrain processor in AERMOD View and 7.5 min DEM quads from the following locations:

- Pocatello North
- Pocatello South
- Inkom
- Moonlight Mountain

The AERMAP processor imports digital elevation map data from WebGIS.com. Topographic features for the ON Semiconductor facility are provided in Appendix H.

8.0 METEOROLOGICAL DATA

The meteorological data used was obtained from the IDEQ. ON Semiconductor was given the choice of using the AERMOD-ready meteorological data set for Inkom for the year 1995 or Simplot Don Plant data set for the years 1997-2001. ON Semiconductor choose to use the Simplot Don Plant (SITE1.1997-2001.SFC and SITE1.1997-2001.PFL, respectively) meteorological data. Per IDEQ evaluation, the Inkom and Simplot meteorological data were more typical of the wind patterns experienced at the ON Semiconductor facility and better represented the diurnal winds that occur in the Portneuf River Valley than those that occur at the Pocatello airport. Figure 4 shows that the winds from the west-southwest and southeast directions predominate.

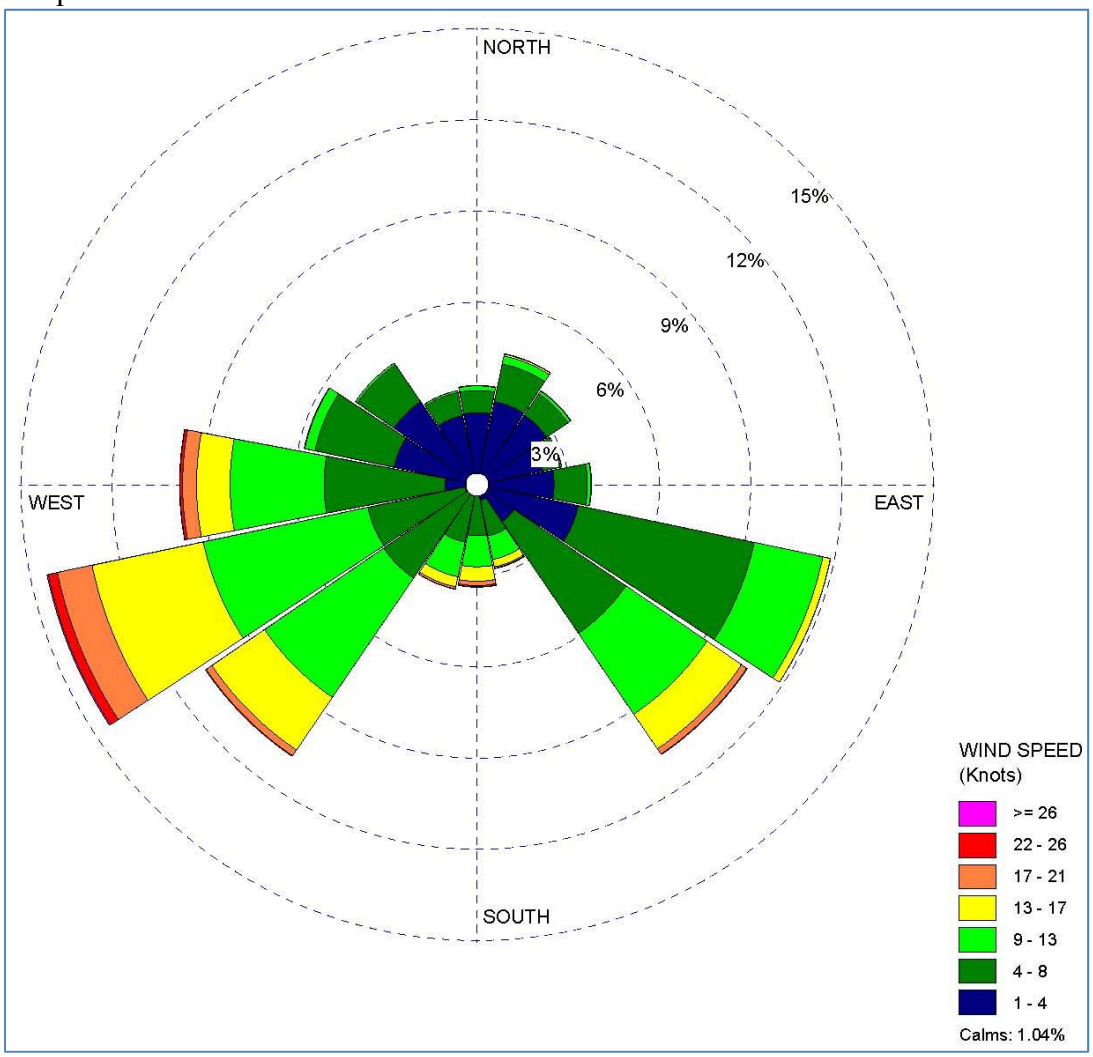

Figure 4. **Simplot Don Plant Wind Rose (1997-2001).**

9.0 LAND-USE ANALYSIS

The ON facility is located in the eastern foothills of the Portneuf Valley, east of south Pocatello. This location, and all areas in the vicinity except those to the west, is outside the urban Pocatello area in the less developed foothills. Portions of the area to the east in the Portneuf Valley are urban or industrial, but the majority of the three kilometer circle includes residential, agricultural land, and open space, which dominates the foothills to the north, east, and south and are also present in other directions. Site reconnaissance showed that the area surrounding the facility is below the 50% urban land use criteria necessary for use of urban dispersion coefficients. Rural dispersion coefficients were therefore used in the air quality dispersion modeling.

10.0 BACKGROUND CONCENTRATIONS

As required by IDEQ Modeling Guidance, IDEQ was contacted to obtain appropriate background concentration data for the local area. The background concentrations in Table 5 and Table 6 were provided in the IDEQ Modeling Protocol approval letter (see Appendix I) and used to determine compliance with NAAQS.

Table 5. Background Concentrations

Pollutant	Averaging Period	Concentration ($\mu g/m^3$)[a]	Background Value Reference
Nitrogen Dioxide (NO_2)	1-hr	See Table 6	See Table 6
	Annual	12	Annual mean of monitored values, 2004 Tribal Monitor, Chubbuck
Carbon Monoxide (CO)	1-hr	15,600	Default: Urban >45,000
	8-hr	5,200	Default: Urban > 45,000
PM-2.5[b]	24-hr	27.6	3-yr average of 98th percentile values, 2004-2006 Pocatello, Garrett & Gould monitor
	Annual	7.8	3-yr average of annual averages, 2004-2006 Pocatello, Garrett & Gould monitor
PM_{10}[c]	24-hr	68	2nd Highest of 1st highest monitored values, 2005-2009 Pocatello, Garrett & Gould monitor

a. Micrograms per cubic meter
b. Particulate matter with an aerodynamic diameter ≤ 2.5 micrometers
c. Particulate matter with an aerodynamic diameter ≤ 10 micrometers

Hour by hour background NO_2 data were provided by IDEQ to support the hourly NO_2 modeling. The hour by hour background NO_2 data are based on monitoring data collected between June 2009 and June 2010 in Meridian Idaho. A separate background value was generated for each hour of the day, based on the 2nd highest value monitored for that hour in the year-long dataset.

Table 6. Hourly NO_2 Background Concentrations[a]

Hour	NO_2 (µg/m³)	Hour	NO_2 (µg/m³)
1:00	50.0	13:00	34.3
2:00	48.1	14:00	34.3
3:00	45.7	15:00	37.8
4:00	46.2	16:00	46.4
5:00	56.7	17:00	49.8
6:00	54.9	18:00	61.8
7:00	56.7	19:00	70.4
8:00	60.1	20:00	85.9
9:00	54.9	21:00	79.0
10:00	48.1	22:00	75.5
11:00	39.5	23:00	63.5
12:00	32.6	24:00	49.8

a. Source: 2nd highest hourly monitored value, 2009-2010, Meridian

11.0 PRESENTATION OF RESULTS

11.1 Criteria Pollutant Modeling Threshold Evaluation

There are no lead emissions from the ON facility based on the chemical inventory. Sulfur dioxide (SO_2) hourly, 24-hour, and annual emissions are below the Threshold I levels so modeling of the SO_2 emissions is not required. All other emission rates exceed the Threshold I level and therefore required modeling.

Table 7. Modeling Threshold Evaluation

Pollutant	Averaging Period	Threshold I	Threshold II	PTE[a]	Modeling Required?
PM_{10}	24-hr	0.22 lb/hr[b]	2.6 lb/hr	4.29	Yes
$PM_{2.5}$	24-hr	0.054 lb/hr	0.63 lb/hr	0.80	Yes
	Annual	0.35 t/yr[c]	4.1 t/yr	3.48	
CO	1-hr, 8-hr	15 lbs/hr	175 lbs/hr	24.88	Yes
NO_2	1-hr	0.2 lb/hr	2.4 lb/hr	80.12	Yes
	Annual	1.2 t/yr	14 t/yr	35.53	
SO_2	1-hr	0.21 lb/hr	2.5 lb/hr	0.10	No
	24-hr	0.22 lb/hr	2.6 lb/hr	0.06	
	Annual	1.2 t/yr	14 t/yr	0.28	
Lead	3-mo rolling avg.	14 lb/mo	--	--	No

a. Summed over all emission sources
b. Pounds per hour
c. Tons per year

11.2 Full Impact Analysis

ON Semiconductor ambient concentrations exceeded the Significant Contribution Levels and so a NAAQS or Full Impact Analysis was conducted. The Full Impact Analyses includes the background concentrations provided in Table 5 and Table 6 to account for other sources contributing to existing pollutant concentrations that are not explicitly modeled.

Table 8 provides the regulatory limits and modeled value used to determine compliance.

Table 8. Significant Contribution Limit and NAAQS Design Concentrations

Pollutant	Averaging Period	Significant Contribution Levels[a] (µg/m³)[b]	NAAQS Regulatory Limits[c] (µg/m³)[b]	Significant Contribution Modeled Value Used	NAAQS Modeled Value Used[d]
Nitrogen Dioxide (NO_2)	1-hour	7.5	188.7	8th highest	8th highest
	Annual	1.0	100	1st highest	1st highest
Sulfur Dioxide (SO_2)	1-hour	7.8	196	4th highest	4th highest
	3-hour	25	1,300	2nd highest	2nd highest
	24-hour	5	365	2nd highest	2nd highest
	Annual	1.0	80	1st highest	1st highest
Carbon Monoxide (CO)	1-hour	2,000	40,000	2nd highest	2nd highest
	8-hour	500	10,000	2nd highest	2nd highest
Lead (Pb)	Quarterly	NA	0.15	1st highest	1st highest
PM_{10}	24-hour	5.0	150	2nd highest	6th highest
$PM_{2.5}$	24-hour	1.2	35	1st highest	1st highest
	Annual	0.3	15	1st highest	1st highest

a. IDAPA 58.01.01.006.102
b. Micrograms per cubic meter
c. IDAPA 58.01.01.577
d. Concentration at any modeled receptor

For all averaging periods for all pollutants, the maximum combined impact of the ON facilities occurred on the property boundary. The modeled worst-case impact entry represents the required maximum predicted impact, as presented in Table 8, for all pollutants and averaging periods, over five years.

Table 9. Background Concentration, Ambient Impact Limits & Comparison of Predicted Concentration with NAAQS Standards

Pollutant	Averaging Period	Background Concentration (µg/m³)	Modeled Value Used (µg/m³)	Worst Case Total Concentration (µg/m³)	NAAQS (µg/m³)	Location Of Highest Impact[2]
NO_2	1-hour	(Note 1)	(Note 1)	147.8	188.7	E of Bld G on fence line
	Annual	12	12.1	24.1	100	E of Bld B on fence line
CO	1-hour	15,600	457	16,057	40,000	E of Bld G on fence line
	8-hour	5,200	132	5,332	10,000	E of Bld G on fence line
PM_{10}	24-hour	68	75.6	143.6	150	E of Bld G on fence line
$PM_{2.5}$	24-hour	27.6	6.5	34.1	35	E of Bld B on fence line
	Annual	7.8	1.2	9	15	W of Bld H on fence line

1. Due to the complexity of the hourly NO_2 air dispersion modeling, actual facility emissions were modeled along with hourly NO_2 background concentrations.
2. Location where maximum 1st highest concentration occurs.

ON Semiconductor is an existing facility and the impacts are a part of the background, however, it is clear that even if the impacts were not part of the background the facility would still comply with the NAAQS. As shown in Table 9, predicted maximum ambient concentrations for all criteria pollutants are below Idaho and National Ambient Air Quality Standards and CO emissions concentrations for each averaging period are actually below significant contribution levels. The actual hourly NO_2 emissions were modeled in AERMOD with the respective hourly background concentrations provided by IDEQ.[9] The maximum 8th highest concentration provided in Table 9 for NO_2 includes the NO_2 background concentrations provided in Table 6.

11.3 TAPs Evaluation

The modeled worst case 24-hour and annual Chi/Q for process sources was used to determine the concentration of the process chemical TAPs listed in Table 3 for comparison against acceptable ambient concentration (AAC) and acceptable ambient concentration for carcinogens (AACC) limits listed in IDAPA 58.01.01.585-586. The worst case 24-hour and annual Chi/Q occurred with stack HSCRUB7F2. Due to restrictions in AERMOD for name length, this stack is listed as HSCRUBF2 in AERMOD input and output files as well as in the database. The combustion equipment TAPs were modeled in the same manner as the criteria pollutants, where each emission source was modeled in AERMOD assuming a unit release rate (1 g/s).

[9] Facility ID No. 005-00017, ON Semiconductor, Inc. [formerly AMI Semiconductor, Inc.] Modeling Protocol Approval for the Initial FEC PTC for an Existing Manufacturing Facility, Revision 1

Table 10 provides the averaging period and modeled value used to determine process TAP compliance.

Table 10. Process TAP Dispersion Coefficient

Pollutant	Chi/Q	Averaging Period	Modeled Value Used[a]
Non-Carcinogenic TAPs	0.0355 (mg/m^3)/(lb/hr)	24-hour	1st highest
Carcinogenic TAP	1.323 (µg/ m^3)/(lb/hr)	Annual	1st highest

a. Concentration at worst case modeled receptor, HSCRUB7F2

The TAP PTE includes facility-wide baseline TAP emissions and proposed growth emission increases of 180% for the ON process TAPs and the equivalent of two new boilers for the combustion equipment TAPs. As can be seen from Table 11, the baseline emissions as well as projected emission increases are below the ambient air concentration limits in IDAPA 58.01.01 585 and 586.

Table 11. Facility-Wide Emission Comparison to Acceptable Ambient Concentration for Non-Carcinogen and Carcinogenic Toxic Air Pollutants Standards

Toxic Air Pollutants	CAS #	PTE (lb/hr)	Chi/Q[1,2] [(mg/m3)/(lb/hr)]	Maximum Predicted Impact (mg/m^3) or (µg/m^3)	AAC/ AACC (mg/m^3) or (µg/m^3)	%AAC or %AACC
Process						
Hydrogen Chloride	7647-01-0	1.17E-01	0.0355	4.15E-03	3.75E-01	1%
Silicon Dioxide	14808-60-7	1.67E-02	0.0355	5.93E-04	5.00E-03	12%
Phosphoric acid	7664-38-2	3.01E-01	0.0355	1.07E-02	5.00E-02	21%
Hydrogen Peroxide	7722-84-1	5.44E-01	0.0355	1.93E-02	7.50E-02	26%
Sulfuric acid	7664-93-9	1.32E+00	0.0355	4.67E-02	5.00E-02	93%
Combustion Equipment						
1,3-Dichloropropene	542-75-6	3.06E-07	--	1.43E-07	2.90E-06	5%
Nickel	7440-02-0	2.19E-04	--	3.25E-04	4.20E-03	8%
Arsenic	7440-38-2	2.09E-05	--	3.1E-05	2.30E-04	13%
Formaldehyde	50-00-0	8.35E-03	--	1.16E-02	7.70E-02	15%
Cadmium	7440-43-9	1.15E-04	--	1.70E-04	5.60E-04	30%

1. TAP Chi/Q evaluations for the boilers and emergency generators are based on the individual stack and are calculated by summing over the number of sources; the concentration for the specified stack, receptor and averaging time for each pollutant. A maximum Chi/Q per stack was not used.
2. The process worse-case Chi/Q occurred for stack HSCRUB7F2. The worse-case Chi/Q = 282 (µg/m^3)/(g/s) which is equivalent to 0.0355 (mg/m^3)/(lb/hr). All facility TAPs that exceed the EL are non-carcinogenic.

12.0 MODELING FILES

The AERMOD modeling input and output files are provided electronically on a compact disk in Appendix J.

13.0 REFERENCES

EPA, 1995. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, AP-42, Fifth Edition, January 1995.

EPA, 2004. User's Guide for the AMS/EPA Regulatory Model – AERMOD, EPA-454/B-03-001, September 2004.

EPA, 2005. Guideline on Air Quality Models. 40 CFR Part 51, Appendix W, Federal Register Vol. 70, No. 216, Wednesday, November 9, 2005.

Idaho Department of Environmental Quality, Rules For the Control Of Air Pollution in Idaho, IDAPA 58 Title 01, Chapter 01.

State of Idaho Guideline for Performing Air Quality Impact Analysis, ID AQ-011 (Rev. 2 July 2011

Appendix A

Stack Parameters

Stack Data

Stack ID	Location	Easting (X)	Northing (Y)	Base Elevation (m)	Stock Height (m)	Stack Type	Diameter (m)	Exit Temp (deg k)	Exit Flow (cfm)	Exit Velocity (m/s)
LS	roof	384557	4746710	1444	11.3	02	0.38 x 0.51	293	500	1.22
ABOI	roof	384624	4746870	1440	4.8	03	0.46	389	1800	5.17
BBOIHWB	roof	384592	4746760	1445	11.3	03	0.51	389	1800	4.19
BBOIST	roof	384596	4746767	1445	13.0	02	0.51	419	3300	7.68
CBOIHWB	roof	384556	4746749	1443	13.7	02	0.56	394	2400	4.62
DBOIHWB	roof	384514	4746722	1440	13.7	02	0.56	366	2400	4.62
DBOIST1	roof	384514	4746718	1440	14.0	02	0.41	491	2250	8.19
GBOIHWE	roof	384519	4746574	1447	8.5	03	0.30	389	400	2.59
GBOISB1	roof	384529	4746589	1447	9.6	03	0.51	450	4050	9.43
GBOISB2	roof	384530	4746581	1448	9.6	03	0.51	450	4050	9.43
GBOISB3	roof	384533	4746581	1448	9.6	03	0.51	450	4050	9.43
BCT1	Behind Bldg B	384604	4746761	1446	4.3	02	2.54	291	9124	0.85
BCT2	Behind Bldg B	384612	4746765	1446	4.7	02	2.13	291	8317	1.10
CCT1	Behind Bldg C	384589	4746741	1446	5.0	02	2.54	291	14681	1.37
CCT2	Behind Bldg C	384598	4746736	1447	5.0	02	2.54	291	12030	1.12
DCT1	Behind Bldg D	384520	4746711	1441	5.6	02	3.05	291	12305	0.80
DCT2	Behind Bldg D	384534	4746711	1443	5.6	02	3.05	291	12305	0.80
GCT1	Behind Bldg G	384561	4746599	1449	7.9	02	3.35	291	23193	1.24
GCT2	Behind Bldg G	384557	4746607	1449	7.9	02	3.35	291	23193	1.24

Stack ID	Location	Easting (X)	Northing (Y)	Base Elevation (m)	Stock Height (m)	Stack Type	Diameter (m)	Exit Temp (deg k)	Exit Flow (cfm)	Exit Velocity (m/s)
BEMGEN	roof	384606	4746772	1445	10.4	04	0.05	894	160	46.00
CEMGENR	roof	384570	4746742	1444	10.7	03	0.05	894	160	46.00
CEMGENS	stand alone	384566	4746758	1443	10.7	02	0.30	716	6024.69	38.97
DEMGEN	roof	384508	4746730	1440	12.2	02	0.06	894	320	56.34
DMREMGEN	roof	384456	4746769	1433	15.9	02	0.08	922	580	49.61
GEEMGEN	stand alone	384549	4746640	1447	5.1	02	0.30	754	5572.66	36.04
GOEMGEN	stand alone	384511	4746554	1447	4.3	02	2.59	281.21	76740.4	6.84
CEXHF1	S side of Bldg C	384550	4746768	1441	11.0	02	1.27	294	6500	2.42
CEXHF5	S side of Bldg C	384544	4746757	1441	11.0	02	1.27	284	11000	4.10
DEXHF8	Adjacent Scrubber #3	384510	4746756	1439	10.4	02	0.30	297	750	4.85
DEXHF15	roof	384488	4746717	1439	8.1	02	0.41 x 0.66	295	7400	13.01
DEXHF16	roof	384456	4746720	1436	7.6	02	0.58 x 0.36	295	1100	2.50
HPEXHF15	roof	384505	4746606	1444	23.7	02	0.56	289	3100	5.97
HPEXHF16	roof	384508	4746606	1444	23.7	02	0.56	289	3100	5.97
HSEXF5	roof	384504	4746617	1444	24.4	02	0.76	294	8000	8.28
HSEXHF4	roof	384500	4746621	1443	24.4	02	0.76	294	8000	8.28
HSEXHF17	roof	384509	4746617	1444	23.2	02	0.41	289	1600	5.82
HSEXHF18	roof	384510	4746617	1444	23.2	02	0.41	289	1600	5.82
DSCRUBF1	roof	384538	4746733	1442	13.1	02	1.27	284	30000	11.18
DSCRUBF2	roof	384538	4746735	1442	13.1	02	1.27	284	30000	11.18
DSCRUBF3	roof	384538	4746733	1442	13.1	02	1.27	284	30000	11.18
DSCRUB5	roof	384460	4746768	1433	16.8	02	0.91	284	11000	7.91
DSCRUB10	roof	384469	4746716	1436	14.9	02	0.51	283	6500	15.14

Stack ID	Location	Easting (X)	Northing (Y)	Base Elevation (m)	Stock Height (m)	Stack Type	Diameter (m)	Exit Temp (deg k)	Exit Flow (cfm)	Exit Velocity (m/s)
DSCRUB14	roof	384463	4746716	1436	15.2	02	0.41	285	1625	5.91
FSCRUB1	roof	384569	4746723	1445	8.4	02	0.51	281	3200	7.45
HSCRUB1	roof	384509	4746615	1444	24.6	02	1.27	286	27500	10.25
HSCRUB2	roof	384511	4746620	1444	24.6	02	1.27	286	31000	11.55
HSCRUB3	roof	384515	4746624	1445	24.6	02	1.27	286	25200	9.39
HSCRUB4	roof	384515	4746630	1444	24.6	02	1.27	286	31000	11.55
HSCRUB7F1	roof	384484	4746689	1438	19.4	02	0.91	287	2200	1.58
HSCRUB7F2	roof	384482	4746689	1438	19.4	02	0.91	287	2200	1.58

Stack Type Key
01 = Downward
02 = Vertical (Uncovered)
03 = Vertical (Covered)
04 = Horizontal
05 = Fugitive

Appendix B

Stack Temperature and Flow Back-up Data

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BEMGEN and CEMGENR B-23
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Stack Temperature Flow

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
Building F	LS	LS	Lime Silo	1984	68	500	4.00	1.22	Lime silo	Flowrate is based on design. Due to the infrequent use of this equipment, flow is not measured. Temperature is assumed to be ambient. Vendor data attached.
Building A	ABOI	ABOI	Boiler	1987	240	1800	16.98	5.17	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building B	BBOIHWB	BBOIHWB	Boiler	1990	240	1800	13.75	4.19	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building B	BBOIST	BBOIST	Boiler	1995	295	3300	25.21	7.68	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building C	CBOIHWB	CBOIHWB	Boiler	1982	250	2400	15.15	4.62	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	DBOIHWB	DBOIHWB	Boiler	1982	200	2400	15.15	4.62	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
Building D	DBOIST1	DBOIST1	Boiler	1983	425	2250	26.86	8.19	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building G	GBOIHWE	GBOIHWE	Boiler	1997	240	400	8.49	2.59	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building G	GBOISB1	GBOISB1	Boiler	1997	350	4050	30.94	9.43	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building G	GBOISB2	GBOISB2	Boiler	1997	350	4050	30.94	9.43	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building G	GBOISB3	GBOISB3	Boiler	1997	350	4050	30.94	9.43	Boiler	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building B	BCT1	BCT1	Cooling Tower	1979	65-95	9124	2.79	0.85	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
										motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building B	BCT2	BCT2	Cooling Tower	1996	65-95	8317	3.60	1.10	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building C	CCT1	CCT1	Cooling Tower	1994	65-95	14681	4.49	1.37	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building C	CCT2	CCT2	Cooling Tower	1985	65-95	12030	3.68	1.12	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
Building D	DCT1	DCT1	Cooling Tower	1983	65-95	12305	2.61	0.80	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building D	DCT2	DCT2	Cooling Tower	1983	65-95	12305	2.61	0.80	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building G	GCT1	GCT1	Cooling Tower	Unknown	65-95	23193	4.07	1.24	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building G	GCT2	GCT2	Cooling Tower	Unknown	65-95	23193	4.07	1.24	Cooling Tower	Vendor data. Fan speeds set flow, with low VFDs operating at 5-10 hz. Flows reduced by 90% of vendor data max flows to account for lowest flow conditions. RPM = (120 * f)/n

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
										where f = frequency and n = number of poles on the motor. Each cooling tower motor has four poles so at 60 hz, the RMP of each motor is 1800 RPM. The new flow rate is based on the fan affinity law where $RPM_1/RPM_2 = Q_1/Q_2$. Vendor data attached.
Building B	BEMGEN	BEMGEN	Emergency Generator	1970	1150	160	150.90	46.00	Emergency Generator	Vendor data. Stack flow and temperature at 100% load rating for generator based on normal operations. No additional flow/temperature data available from the vendor. Due to the short duration of operations, flows are not measured. For modeling purposes, stack velocity was set to 0.001 m/s because BEMGEN has a horizontal exhaust release.
Building C	CEMGENR	CEMGEN R	Emergency Generator	1974	1150	160	150.90	46.00	Emergency Generator	Vendor data. Stack flow and temperature at 100% load rating for generator based on normal operations. No additional flow/temperature data available from the vendor. Due to the short duration of operations, flows are not measured. For modeling purposes, stack velocity was set to 0.001 m/s because CEMGENR has a capped stack, inhibiting exhaust release.
Building C (outside, S side)	CEMGENS	CEMGEN S	Emergency Generator	2001	829.22	6024.69	127.85	38.97	Emergency Generator	Vendor data. Stack flow and temperature at 50% load rating for generator based on normal operations. Exhaust port diameter increased from 10.0" to 12.0". Stack flow only exceeds 50 meters per second if generator is operated above 75% loading. See Appendix I.

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
Building D	DEMGEN	DEMGEN	Emergency Generator	1983	1150	320	184.85	56.34	Emergency Generator	Vendor data. Stack flow and temperature at 100% load rating for generator based on normal operations. No additional flow/temperature data available from the vendor. Due to the short duration of operations, flows are not measured. Exhaust port changed from equipment spec sheet. Exhaust port diameter increased from 2.0" to 2.3". This increase lowered the exit velocity to just over 50 meters per second at 100% load. Vendor data attached.
Building D Support Room 1138	DMREMGEN	DMREMGEN	Emergency Generator	1996	1200	580	162.75	49.61	Emergency Generator	Vendor data. Stack flow and temperature at 100% load rating for generator based on normal operations. No additional flow/temperature data available from the vendor. Due to the short duration of operations, flows are not measured. Exhaust port changed from equipment spec sheet. Exhaust port diameter increased from 3.0" to 4.0". This increase lowered the exit velocity to 50 meters per second at 100% load. Vendor data attached.
Building G (outside, N side)	GEEMGEN	GEEMGEN	Emergency Generator	1998	898.16	5572.66	118.26	36.04	Emergency Generator	Vendor data. Stack flow and temperature at 50% load rating for generator based on normal operations. Exhaust port diameter increased from 10.0" to 12.0". Stack flow only exceeds 50 meters per second if generator is operated above 75% loading. See Appendix I.
Building G (outside, S side)	GOEMGEN	GOEMGEN	Emergency Generator	2005	46.5	76740.4	22.44	6.84	Emergency Generator. This is the effective diameter. Actual opening is irregular	Generator and fan exhaust are routed to same stack, accounting for the high flow. Stack flow is based on 50% load rating for generator for normal operations and 68,000 cfm for the fan exhaust. Due to the high air

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
									with an open area of 57ft2.	flow rate, the temperature is assumed to be the average air temperature for Pocatello (http://www.average-temperature.com/temps/ID/Pocatello). See Appendix I.
Building C	FAB 9 & FAB 10	CEXHF1	Exhaust Fan 1	2005	70	6500	7.95	2.42	Organic emission (no abatement)	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building C	FAB 9 & FAB 10	CEXHF5	Exhaust Fan 5	1975	52	11000	13.45	4.10	Organic emission (no abatement). Changed nomenclature from CSCRUB1 to CEXHF5. This scrubber was disconnected from the stack and changed to an exhaust fan in 2005.	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	FAB 9 & FAB 10	DEXHF8	Exhaust Fan 8	2000	75	750	15.92	4.85	Solids that would contain arsenic contamination (manual blower with cloth filter) Changed Stack ID to DEXHF8 from "Exhaust Fan 8"	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	FAB 9 & FAB 10	DEXHF15	Exhaust Fan 15	1983	72	7400	42.69	13.01	Paint exhaust, through a paper filter from incidental/infrequent	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
									paint can applications	normal operations.
Building D	FAB 9 & FAB 10	DEXHF16	Exhaust Fan 16	1983	72	1100	8.20	2.50	Exhaust. Solvent (strictly storage, no solvent use)	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HPEXHF15	Pyro ExF 15	1997	60	3100	19.57	5.97	Exhaust. NH_3 and SiH_2Cl_2 cylinder storage	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HPEXHF16	Pyro ExF 16	1997	60	3100	19.57	5.97	Exhaust. On Stand-by. NH_3 and SiH_2Cl_2 cylinder storage	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSEXF5	Solvent ExF 5	1997	69.6	8000	27.16	8.28	Solvent exhaust. On Stand-by	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSEXHF4	Solvent ExF 4	1997	69.6	8000	27.16	8.28	Solvent exhaust	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSEXHF17	Silane ExF 17	1997	60	1600	19.10	5.82	Exhaust. Silane cylinders with distribution cabinets (hard plumbed)	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.

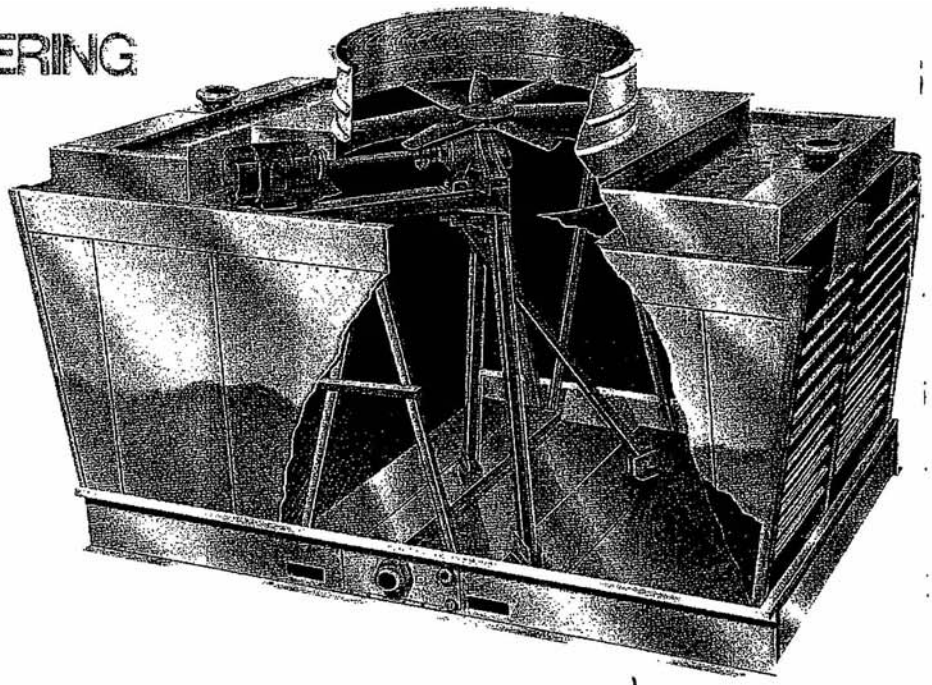
Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
Building H	FAB 9 & FAB 10	HSEXHF18	Silane ExF 18	1997	60	1600	19.10	5.82	On Stand-by. Silane cylinders with distribution cabinets (hard plumbed)	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	FAB 9 & FAB 10	DSCRUB F1	Scrubber 1 & 2	1984	51.1	30000	36.67	11.18	Wet scrubber. 2 of 3 fans exhausting from DSCRUB1 and DSCRUB2. 1 in stand- by.	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	FAB 9 & FAB 10	DSCRUB F2	Scrubber 1 & 2	1984	51.1	30000	36.67	11.18	Wet scrubber. 2 of 3 fans exhausting from DSCRUB1 and DSCRUB2. 1 in stand- by.	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	FAB 9 & FAB 10	DSCRUB F3	Scrubber 1 & 2	1984	51.1	30000	36.67	11.18	Wet scrubber. 2 of 3 fans exhausting from DSCRUB1 and DSCRUB2. 1 in standby.	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D Gas House 10	FAB 9 & FAB 10	DSCRUB 5	Scrubber 5	1997	52.1	11000	25.94	7.91	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building D	FAB 9 & FAB 10	DSCRUB 10	Scrubber 10	1990	50.6	6500	49.66	15.14	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
Building D	FAB 9 & FAB 10	DSCRUB 14	Scrubber 14	1996	54.2	1625	19.40	5.91	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building F	Bld F	FSCRUB1	Scrubber 1	1983	47	3200	24.45	7.45	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSCRUB 1	Scrubber 1	1997	55	27500	33.61	10.25	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSCRUB 2	Scrubber 2	1997	54.4	31000	37.89	11.55	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSCRUB 3	Scrubber 3	2004	55	25200	30.80	9.39	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSCRUB 4	Scrubber 4	2000	54.6	31000	37.89	11.55	Wet scrubber	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 &	HSCRUB	Scrubber 7	2011	56.7	2200	5.19	1.58	Wet scrubber. HSCRUB 7	Temperature and flow measurements are taken annually in accordance with ASHRAE

Location	Emissions Unit ID	Stack ID	Unit Type	Install Year	Exit Temp (deg F)	Exit Flow (cfm)	Exit Velocity (ft/s)	Exit Velocity (m/s)	Notes/ Remarks	Flow/Temperature Data Basis
	FAB 10	7F1							exhausted from two separate fans/stacks HDSCRUB7F1 and HSCRUB7F2.	111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.
Building H	FAB 9 & FAB 10	HSCRUB 7F2	Scrubber 7	2011	56.7	2200	5.19	1.58	Wet scrubber. HSCRUB 7 exhausted from two separate fans/stacks HDSCRUB7F1 and HSCRUB7F2.	Temperature and flow measurements are taken annually in accordance with ASHRAE 111, Measurement, Testing, Adjusting and Balancing of Building HVAC Systems during normal operations.

BCT 1

ENGINEERING DATA



MODEL	8805	8806	8807	8808	8809	8810	8811	8812	8813	88
†Nom. tons	200	225	250	300	325	350	400	425	450	50
Length	7'-3½	7'-10½	7'-10½	7'-10½	9'-4½	9'-4½	9'-4½	9'-4½	9'-4½	9'-4
Width	15'-6 3/16	15'-0 13/16	16'-8 3/16	18'-5 3/16	17'-5 3/16	17'-5 3/16	18'-8 3/16	20'-4 3/16	20'-4 3/16	20'-5
Height	9'-3⅛	10'-1¼	10'-1¼	10'-2	10'-2	10'-2	11'-4⅜	11'-4⅜	11'4⅜	12'-1
Shipping Wt.	4850	4960	5480	5940	6880	7050	7700	7960	8130	88
Operating Wt.	10880	11160	12360	13540	15520	15680	16880	17900	18080	186
*Motor H.P.	10	10	10	15	15	20	20	20	25	25
Fan Dia & Type	72H3-8	72H3-8	72H3-8	84H3-8	84H3-6	84H3-10	96H3-8	96H3-10	96H3-10	96H3
RPM (60 Hertz)	535	535	535	463	463	463	463	463	463	46
RPM (50 Hertz)	535	535	535	444	444	444	444	444	444	44
CFM	52745	59560	57800	68045	76590	83880	91235	88080	94645	1067
Geareducer	20T	20T	20T	20T	20T	20T	20T	20T	20T	20
Ratio/1 (60 Htz)	3.27	3.27	3.27	3.78	3.78	3.78	3.78	3.78	3.78	3.7
Ratio/1 (50 Htz)	2.71	2.71	2.71	3.27	3.27	3.27	3.27	3.27	3.27	3.2
G.P.M. Min.	170	190	190	200	200	210	240	250	250	28
G.P.M. †Max.	985	1125	1250	1440	1625	1715	1870	2125	2125	250
No. of Orifice/Twr.	88	96	144	144	168	168	168	196	196	19
Suction (Beveled & Grooved	varies according to GPM									
Overflow (F)	3	3	3	3	3	3	3	3	3	3
Drain (F)	3	3	3	3	3	3	3	3	3	3
Float Valve (M) or (F) Inlet Size	varies according to GPM									

Optional Equipment	
Air Inlet Screens	Field Installed #2 Mesh x .063 Galv. Wire Screen #16 Gage Metal "U" Edge Frame.
External Oil Sight Gage	Shop Installed — Glass Tube Brass Body Sight Gage is Installed Next to the Fill Pipe.
Vibration Isolation	Four Spring Isolators Under Tower. (Marley Choice of Vendor.) Vibration Isolation Under Mechanical Equipment Not Available. Two or more cells connected by equalizing flumes must be isolated beneath a comm unitized support system. Consult your Marley Sales Engineer.
Dist. Basin Covers	16 gauge HMG steel — supported by basin sides.
Flow Control Valves	Marley Flow Control Valves — ship separate — bolt to cast iron inlet adapter.
Ladder & Handrail (field installed)	Ladder is aluminum — 1'-6 wide with 3" I-Beam side rails and 1¼ Dia. rungs. Hand rail is 3'-6 high above f deck with 14 gauge toe plates.
External lube line with dip stick	Stand pipe/dip stick assembly allows checking Geareducer oil level & filling from outside of tower.

*Standard voltages are 200 volts or 230/460 volts
Two speed motors are one voltage only (200 volts, or 460 volts)
When two speed motors are used a time delay (20 seconds min.) must be provided by others when switching from high to low speed.

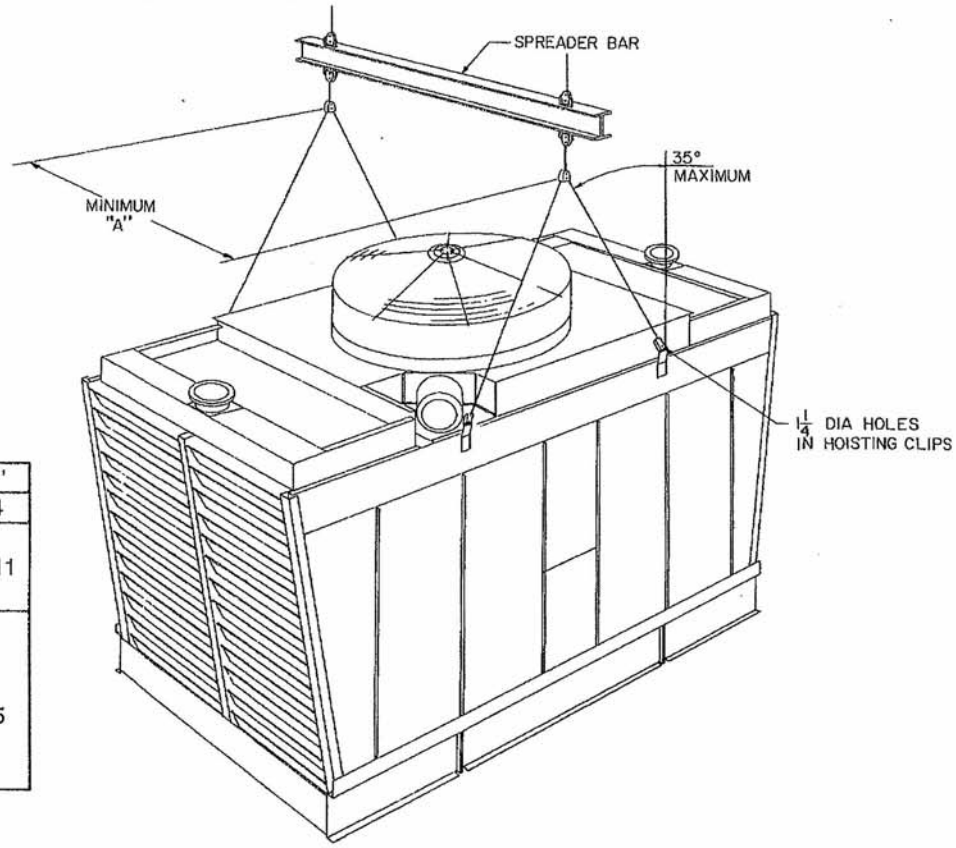
†95°—85°—78°WB, 3 GPM/ton

**We reserve the right to make changes in dimensions and specifications without notic

PECIFICATIONS

ENERAL	Furnish and install an induced draft, vertical discharge, packaged, crossflow-type cooling tower. Total horsepower requirements shall not exceed _____HP.
APACITY	The tower shall be guaranteed to cool _____ 1870 GPM from 85° °F to 75 °F at a 68°F °F wet bulb.
ASING & OUVERS	Casing shall be heavy mill galvanized steel sheets installed vertically with U-edge and flange. Louvers shall be shop installed HMG formed steel, sight tight to a horizontal view.
ARDWARE & FINISH	All bolts, nuts and washers shall be galvanized steel. All steel used in the construction of the cooling tower shall be galvanized. Standard coating shall be 2½ oz. per square foot.
TRIBUTION BASIN	Open gravity type distribution basin using plastic diffusing type metering orifices shall be provided. Flanged connection for contractor piping shall be suitable for flow control valves or direct piping connection.
ECHANICAL QUIPMENT	There shall be _____ fan(s) of the propeller type with cast aluminum blades. Each blade shall be adjustable and individually attached to an _____ hub. Fan drive(s) shall be through Series 6Q Twinflex driveshaft (tubular HDG steel shaft with rubber bushed yokes) and connected to a right-angle Geareducer.
COLLECTION BASIN	Cold water collection basin floor and sides shall be bolted, heavy mill galvanized steel. Basin shall be self-cleaning and complete with depressed center section, cleanout and drain fitting, side outlet suction with screen and anti-cavitation device and float activated make-up valve. The basin shall be designed to support the tower when resting on only two grillage beams.
FILL AND DRIFT ELIMINATORS	Fill and drift eliminator material shall be non-corrosive and nonferrous. Fill shall consist of vertical sheets of polyvinyl chloride with three-pass, integral eliminators. Drift loss shall be limited to 0.2% of the water circulated.
ACCESS AND SAFETY	Access panels shall be provided on both end-walls for access to the eliminator and plenum section. A heavy gauge, galvanized wire, grill type fan guard shall be provided over each fan cylinder.
SOUND	Reduced fan speed applications to meet restrictive sound level criteria are available.
WORK BY OTHERS	Supporting steel grillage, motor starting equipment, pumps, wiring and water treating equipment shall be supplied by others.

HOISTING INSTRUCTIONS

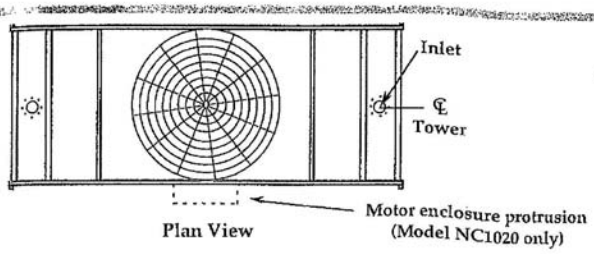


MODEL	"A"
8805	7'-4
8806	7'-11
8807	
8808	
8809	9'-5
8810	
8811	
8812	
8813	
8814	

BCT 2 and CCT 1

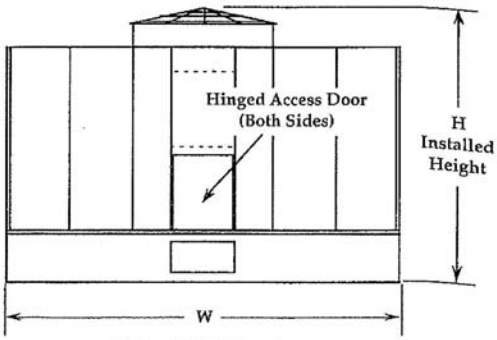
CCT1 & BCT2

Engineering Data

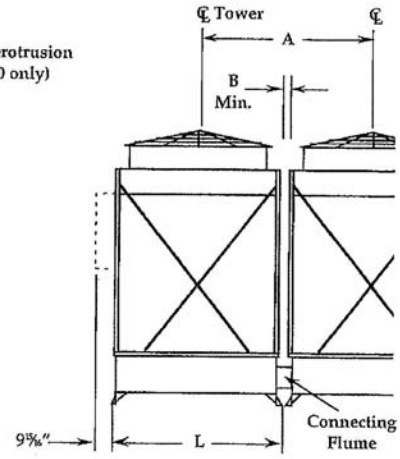


Plan View

Except for Model NC1020, dimension "A" repeats for any number of cells. Model NC1020 requires special spacing for 3 or more cells



Casing Side Elevation



Air Inlet Side Elevation

Tower Model	Nominal Tons (1)	Dimensions W	L	H	A	B	Shipping Weight (lbs.)	Motor HP	Nominal Airflow (CFM)	Inlet Connections
NC1001	145	14'-0	6'-4¾	10'-1½	6'-5½	¾"	4,400	5	44,450	2@6"
NC1011	165	14'-0	6'-4¾	10'-1½	6'-5½	¾"	4,455	7.5	51,390	2@6"
NC1021	174	14'-0	6'-4¾	10'-1½	6'-5½	¾"	4,620	10	54,750	2@6"
NC2001	188	15'-6	7'-10¾	10'-2¼	7'-11½	¾"	5,555	7.5	60,380	2@6"
NC2011	209	15'-6	7'-10¾	10'-2¼	7'-11½	¾"	5,580	10	66,460	2@6"
NC2021	235	15'-6	7'-10¾	10'-2¼	7'-11½	¾"	5,675	15	77,150	2@6"
NC3001	237	15'-6	7'-10¾	11'-11¼	7'-11½	¾"	6,005	10	71,300	2@6"
BCT2 → NC3011	270	15'-6	7'-10¾	11'-11¼	7'-11½	¾"	6,085	15	83,170	2@6"
NC3021	291	15'-6	7'-10¾	11'-11¼	7'-11½	¾"	6,145	20	90,710	2@6"
NC4001	328	17'-0	8'-10¾	12'-11¾	8'-11½	¾"	7,400	15	99,500	2@6"
NC4011	355	17'-0	8'-10¾	12'-11¾	8'-11½	¾"	7,460	20	109,030	2@6"
NC4021	378	17'-0	8'-10¾	12'-11¾	8'-11½	¾"	7,510	25	117,420	2@6"
NC5001	414	18'-9	10'-10¾	12'-11¾	10'-11½	¾"	9,250	20	113,550	2@8"
NC5011	443	18'-9	10'-10¾	12'-11¾	10'-11½	¾"	9,300	25	122,500	2@8"
NC5021	462	18'-9	10'-10¾	12'-11¾	10'-11½	¾"	9,370	30	128,090	2@8"
NC5031	514	18'-9	10'-10¾	12'-11¾	10'-11½	¾"	9,675	40	144,010	2@8"
NC6001	498	19'-10	11'-10¾	12'-11¾	11'-11½	¾"	10,190	25	138,040	2@8"
CCT1 → NC6011	527	19'-10	11'-10¾	12'-11¾	11'-11½	¾"	10,260	30	146,810	2@8"
NC6021	574	19'-10	11'-10¾	12'-11¾	11'-11½	¾"	10,405	40	161,150	2@8"
NC7001	517	21'-10	11'-10¾	13'-3¾	11'-11½	¾"	11,155	25	138,750	2@8"
NC7011	546	21'-10	11'-10¾	13'-3¾	11'-11½	¾"	11,230	30	146,700	2@8"
NC7021	592	21'-10	11'-10¾	13'-3¾	11'-11½	¾"	11,375	40	159,500	2@8"
NC7031	638	21'-10	11'-10¾	13'-3¾	11'-11½	¾"	11,440	50	171,830	2@8"
NC7041	652	21'-10	11'-10¾	13'-3¾	11'-11½	¾"	11,720	60	175,750	2@8"

Table Notes

1. Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton.
2. All table data is per cell.
3. Last digit of model number indicates number of cells. Change as appropriate for your selection.
4. Standard overflow is 4" dia. standpipe inside basin. Standpipe removes for flush-out and drain. See pages 16 & 17 for details & options.
5. Outlet sizes vary according to GPM and arrangement. See pages 16 & 17 for outlet sizes and details.
6. Make-up connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 16.

13

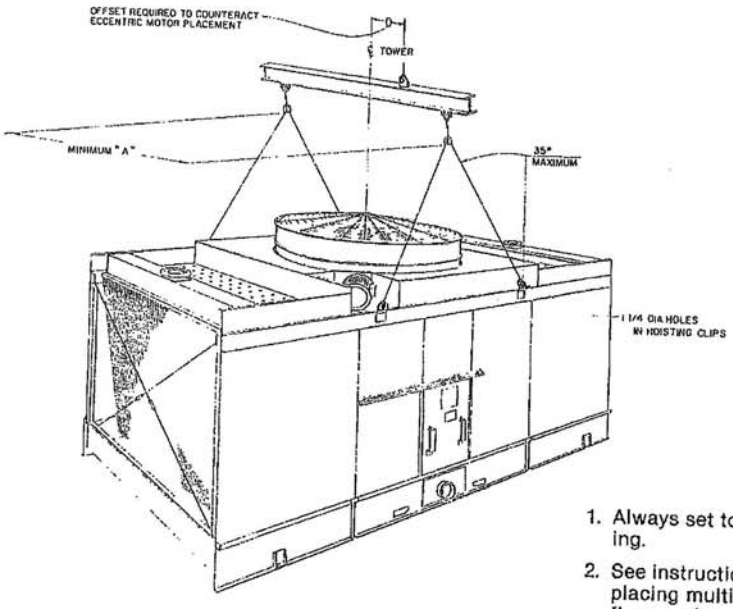
CCT 2

ENGINEERING DATA

MODEL	8904	8905	8906	8907	8908	8910	8911	8912	8913	8914	8915	8916	8917
Length	6'4½	6'-4½	6'-4½	7'-10½	7'-10½	8'-10½	7'-10½	7'-10½	8'-10½	8'-10½	10'-10½	10'-10½	11'-10½
Width	17'-1¾	17'-1¾	17'-1¾	17'-1¾	17'-1¾	17'-1¾	19'-1¾	19'-1¾	19'-1¾	19'-1¾	19'-1¾	19'-1¾	19'-10½
Height	10'-0¾	10'-0¾	10'-0¾	10'-1½	10'-1½	10'-2¼	12'-11¼	12'-11¼	12'-11¾	12'-11¾	12'-11¾	12'-11¾	12'-11¾
Shipping Wt.	4390	4420	4600	5010	5260	5790	6830	6870	7390	7450	8450	8740	9290
Operating Wt.	11060	11080	11260	13340	13580	15220	16080	16120	17860	17920	21400	21680	23980
Motor H.P.*	5	7½	10	7½	15	15	15	20	20	25	25	40	40
Fan Dia & Type	60H3-6	60H3-6	60H3-6	72H3-6	72H3-6	84H3-6	84H3-6	84H3-6	96H3-8	96H3-8	96H3-8	96H3-8	108H3-8
RPM (60 Hertz)	535	670	646	535	646	463	463	535	463	463	463	507	427
RPM (50 Hertz)	555	680	535	555	535	443	443	535	443	443	443	N/A	420
CFM	36300	42100	44400	53300	66200	74500	82000	91100	100600	108400	120300	140700	147200
Gearedcer	10T	10T	20T	10T	20T	20T	20T	20T	20T	20T	20T	22.2	22.2
Ratio/1 (60 Htz)	3.27	2.62	2.71	3.27	2.71	3.78	3.78	3.27	3.78	3.78	3.78	3.45	4.10
Ratio/1 (50 Htz)	2.62	2.13	2.71	2.62	2.71	3.27	3.27	2.71	3.27	3.27	3.27	N/A	3.45
G.P.M. Min.	175	200	225	250	300	350	400	425	450	500	550	600	650
G.P.M. Max.	875	1000	1125	1250	1500	1750	2000	2125	2250	2500	2750	3000	3250
No. of Orifice/Twr	144	144	144	180	180	204	180	180	204	204	252	252	276
Water Inlet Sizes	6	6	6	6	6	6	8	8	8	8	8	8	8
Outflow Size	varies according to GPM and type utilized. (See Table, page 18.)												
Overflow and Drain (F)	4" removable overflow pipe provides flush-out drain												
Float Valve (M) or (F) Inlet Size	varies according to GPM (See Table, page 17.)												
Optional Equipment	(See Pages 16-22)												

*Standard voltages are 200, 230/460, or 575 volts.
Two speed motors are one voltage only (200, 230, 460, or 575 volts.)
When two speed motors are used a time delay (20 seconds min.) must be provided by others when switching from high to low speed. Reversing starters must incorporate a two minute time delay between directions.

RIGGING INSTRUCTIONS FOR HOISTING NC II TOWER



MODEL	"A"
8904	6'-4
8905	
8906	
8907	7'-11
8908	
8910	8'-11
8911	7'-11
8912	
8913	8'-11
8914	
8915	10'-11
8916	
8917	11'-11
8918	

NOTE

1. Always set tower on a level surface to avoid rac ing.
2. See instructions on access door and basin befc placing multi-cell units. If cells are connected flume, refer to flume installation drawing shipp in literature package. Flume must be attache prior to final positioning of adjacent cells.

—8—

DCT 1 and DCT 2

MODEL	4805	5506	6807	8606	8809	8810	8611	8612	8613	8614	8615	8616	8617	8618
†Nom. tons	200	225	250	300	325	350	400	425	450	500	550	600	650	700
Length	7'-3 7/8	7'-10 1/2	7'-10 1/2	7'-10 1/2	9'-4 1/2	9'-4 1/2	9'-4 1/2	9'-4 1/2	9'-4 1/2	9'-4 1/2	10'-10 1/2	10'-10 1/2	11'-10 1/2	11'-10 1/2
Width	15'-5 5/16	16'-5 1/16	16'-8 1/16	16'-5 1/16	17'-5 9/16	17'-5 9/16	18'-8 9/16	20'-4 9/16	20'-4 9/16	20'-9 1/16	21'-10	21'-10	21'-10	21'-10
Height	9'-3 1/4	10'-1 1/4	10'-1 1/4	10'-2	10'-2	10'-2	11'-4 7/8	11'-4 7/8	11'-4 7/8	12'-10 7/8	12'-10 1/4	12'-10 1/4	12'-10 1/4	12'-10 1/4
Shipping Wt.	4650	4960	5380	5940	6880	7050	7770	7960	8130	8810	10240	10340	10940	11000
Operating Wt.	10880	11160	12360	13540	16520	15680	16680	17900	18080	18620	22330	22430	24780	24240
*Motor H.P.	10	10	10	15	15	20	20	20	25	25	30	40	40	50
Fan Dia.& Type	72H3-8	72H3-8	72H3-8	84H3-8	84H3-8	84H3-10	96H3-8	96H3-10	96H3-10	96H3-10	120H3-12	120H3-12	120H3-12	120H3-12
RPM (60 Hertz)	535	535	535	463	463	463	463	463	463	463	388	427	386	427
RPM (50 Hertz)	535	535	535	444	444	444	444	444	444	444	354	420	420	420
CFM	52745	59560	57800	68045	76550	83880	91235	89080	94645	106750	123046	129500	142375	150889
Geareducer	20T	20T	20T	20T	20T	20T	20T	20T	20T	20T	22.1T	22.1T	22.1T	22.1T
Ratio/1 (60 Hz)	3.27	3.27	3.27	3.78	3.78	3.78	3.78	3.78	3.78	3.78	4.56	4.10	4.56	4.10
Ratio/1 (50 Hz)	2.71	2.71	2.71	3.27	3.27	3.27	3.27	3.27	3.27	3.27	4.10	3.45	3.45	3.45
G.P.M. Min.	375	490	590	600	800	840	940	1050	1150	1250	1500	1600	1650	1700
G.P.M. Max.	985	1125	1250	1440	1625	1715	1870	2125	2150	2500	2750	3000	3250	3500
No. of Orifice/Twr.	48	96	144	144	168	168	168	196	196	196	238	238	252	252
Suction (Beveled) & Grooved	Varies according to GPM													
Overflow (F)	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Drain (F)	3	3	3	3	3	3	3	3	3	3	1 1/2	1 1/2	4 1/2	1 1/2
Float Valve (M) or (F) Inlet Size	Varies according to GPM													

Optional Equipment
Air Inlet Screens
External Oil Sight Gauge
Vibration Isolation

Shop Installed #2 Mesh x .063 Galv. Wire Screen #16 Gage Metal "U" Edge Frame.
Shop Installed—Glass Tube Brass Body Sight Gage is Installed Next to the Fill Pipe.
Four Spring Isolators Under Tower. (Marley Choice of Vendor.) Vibration Isolation Under Mechanical Equipment Not Available. Two or more cells connected by equalizing flumes must be isolated beneath a common unitized support system. Consult your Marley Sales Engineer.

Dist. Basin Covers
Flow Control Valves
Ladder & Handrail (field installed)
External fence line with clip stick

16 gauge HMG steel—Supported by basin sides. Shop installed.
Marley Flow control Valves—ship separate—bolt to cast iron inlet adapter.
Ladder is aluminum—1'-6 wide with 3" I-Beam side rails and 1" Dia. rungs. Hand rail is 3'-6 high above fan deck with 14 gauge toe plates.
Stand pipe/dip stick assembly allows checking Geareducer oil level & filling from outside of tower.

*Standard voltages are 200 volts or 230/460 volts.
Two speed motors are one voltage only (200 volts or 460 volts).
When two speed motors are used a time delay (20 seconds min.) must be provided by others when switching from high to low speed.

195—68°—78°Wb, 3 GPM/ft²

We reserve the right to make changes in the dimensions and specifications without notice.

Engineering Data

BLDG D
TOWERS 1 & 2
DCT1 & DCT2

GCT 1 and GCT 2

GCT1 & GCT2

```
==============================================
|        Marley UPDATE - Version 94.11       |
| Unitary Product Data And Thermal Evaluation |
----------------------------------------------
|            Copyright (C) 1993              |
|      The Marley Cooling Tower Company      |
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Technical Data (Effective 11-01-1994):

Model: NC9141 60 HP/Cell 1800 RPM
Fan : 11.00 Ft Dia, 9 Blades, 384 RPM

Tip Speed: 13270 Ft/min
Air Flow : 231930 CFM Per Cell
231930 CFM Total

Weights:

	Per Cell	Total
Shipping	16580 lbs	16580 lbs
Operating	34684 lbs	34684 lbs

Dimensions:

	Per Cell	Total
Width	22.42 Ft	22.42 Ft
Length	11.90 Ft	11.90 Ft
Height	19.80 Ft	19.80 Ft
St. Lift	19.07 Ft	

For more dimensional details see Marley drawing 94-22452
For CAD layouts refer to DXF file NC9100

Minimum Clearance for Enclosures:
Clearance required on air inlet sides of tower without altering performance. Assumes no air from below tower.

Solid Wall: 8.61 Ft
50% Open Wall: 6.42 Ft

Top of enclosure must not extend above top of tower.
For enclosures not meeting these criteria, contact your Marley sales representative for affect on performance.

Collection Basin Heater Sizing:
Minimum ambient temperature to maintain water at 40.0 F

Heater kW/Cell	6.0	7.5	9.0	12.0	15.0	18.0	24.0	30.0
Ambient Temp F	29.6	26.1	22.6	15.5	8.4	1.4	-12.7	-26.8

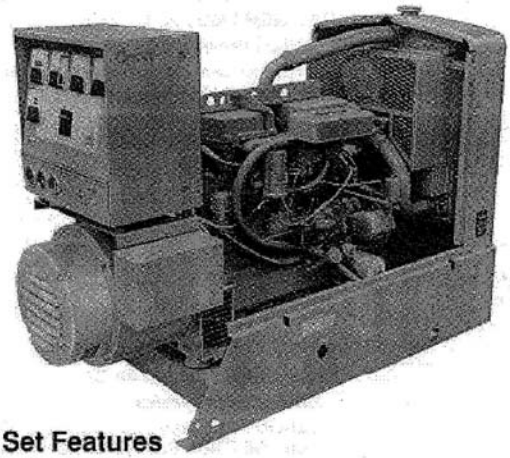
BEMGEN and CEMGENR

BEMGEN : CEMGENR

Onan

15 RJC 60 Hz
12.5 RJC 50 Hz
Spark-Ignited Generator Set

	STANDBY 1-Phase	STANDBY 3-Phase
60 Hz	15 kW 15 kVA	15 kW 19 kVA
50 Hz	12.5 kW 12.5 kVA	12.5 kW 16 kVA



Generator Set Features

- **Single-source design, manufacturing and testing of all set components and accessories by Onan Corporation.**
- **Accepts 100% of nameplate kW rating in one step, in compliance with NFPA 110, Paragraph 5-13.2.6.**
- **Engine torque-matched excitation system provides quick recovery from transient speed dips.**
- **Low reactance generator design offers low waveform distortion with non-linear loads and provides excellent motor starting capabilities.**

Standard Equipment

ENGINE
Onan, multi-fuel capability – gasoline, natural gas, propane and combinations available.

ALTERNATOR
Brushless Onan AC alternator provides broad range reconnectible output.

CONTROL PANEL
Vibration isolated control with analog instrumentation.

VOLTAGE REGULATOR
Electronic voltage regulator provides precise regulation and underfrequency compensation.

COOLING SYSTEM
High ambient 104° F (40° C) system.

SKID BASE
Supports the alternator and engine. Battery rack and cooling system mount to the skid base. Integral vibration isolation.

Generator Set Testing

The Prototype Test Support (PTS) program is our commitment to verifying the integrity of our designs and products.

Before the generator sets are put into production, prototype models are subjected to demanding tests with typical/atypical loads and transients anticipated in service.

Production models earn the PTS seal only after meeting the performance criteria established by the program.

Single-Source Warranty

All generator set components and systems are covered by a limited one-year warranty. Optional two- and five-year extended programs are available.

Standard Models are CSA certified.

Generator Set Performance

Voltage Regulation
At constant load, from no load to 100% load will be within ± 2%.
Random Voltage Variation
At constant load, from no load to 100% load will not exceed ± 1% of its mean value.
Frequency Regulation
Under varying loads from no load to 100% load: 5% maximum.
Random Frequency Variation
Will not exceed ± 0.5% of its mean value for constant loads from no load to full load.
Electromagnetic Interference Attenuation
Meets requirements of most industrial and commercial applications.

AC Waveform Total Harmonic Distortion
Less than 5% total no load to full load, and less than 3% for any single harmonic
Telephone Influence Factor (TIF)
Less than 40 per NEMA MG1-22.43.
Telephone Harmonic Factor (THF) Less than 3.
Alternator Temperature Rise
At rated load is less than 105° C at standby rating, per NEMA MG1.22.40, IEEE115 and IEC 34–1.
Radio Interference
Alternator and voltage regulator meet the provisions of BS.800 and VDE Class G and N.
Ratings and Performance
The standby power rating is applicable for the duration of normal power interruption. No overload is available at this rating.

Engine: Onan 4-cylinder, in-line, multi-fuel

Design: 4-cycle, water-cooled, natural aspiration
Bore: 3.25" (83 mm) **Stroke:** 3.625" (92 mm)
Piston Displacement: 120 cubic inches (2.0 liters)
Compression Ratio: 6.5:1
Starting: 12-volt, 2-wire, negative ground
Cranking Current: 225 amps at ambient temperature of 32° F (0° C).
Battery Charging: Adjustable, 2-5 amp.
Cast Iron Cylinder Block
Valves: overhead
Governor: Adjustable, mechanical, flyball, pressure lubricated.

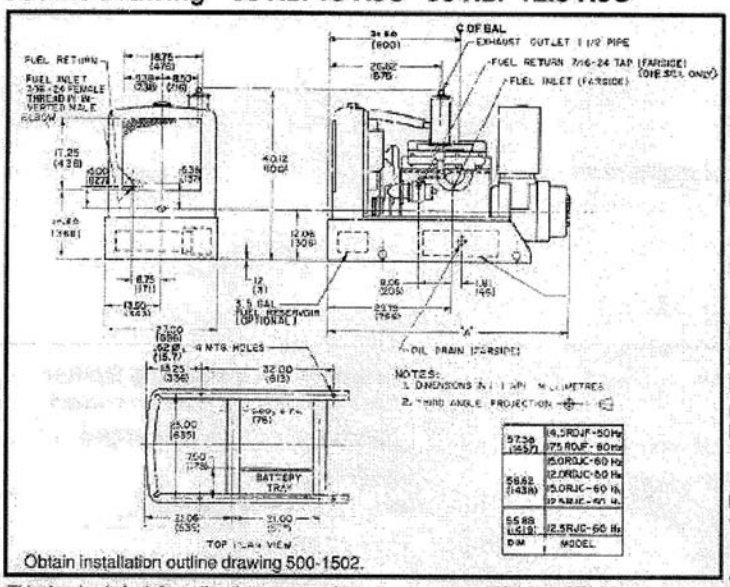
Fuel System: Gasoline – Horizontal carburetor: Mechanical fuel pump; Fuel lift 6 feet (1.8 meters): Automatic electric choke.
Natural gas/propane – Facet carburetion.
Oil-Wetted Element Air Cleaner with Restriction Indicator
Lube Oil Capacity: 6.5 US quarts (6 liters)
Lube Oil Filter: Single Spin-On, Full Flow
Typical Lube Oil Consumption:
3 US quarts (3 liters) – per 100 Hours
Cooling System
High Ambient 104° F (40 ° C) Radiator.
Coolant Capacity: 12 US quarts (11 liters)

Alternator: Onan

Design:
Revolving field, single bearing, 4-pole, brushless, drip-proof construction. Standard 105° C temperature rise at standby power rating. Class F insulation system per NEMA MG1–1.65 and BS2757. The main alternator and exciter insulation systems are suitable for typical standby applications.
Stator:
Skewed stator and 2/3 pitch windings minimize field heating and voltage harmonics.
Rotor:
Dynamically balanced assembly. Direct coupled to engine by a flexible drive disc. Complete amortisseur (damper) windings help minimize voltage deviations and heating effects under unbalanced loads. The rotor is supported by a pre-lubricated, maintenance-free ball bearing.

Torque-Matched Voltage Regulation:
The voltage regulator provides torque-matched underfrequency compensation to optimize motor starting performance and assist the engine during transient load conditions. The brushless exciter armature powers the main alternator field winding through shaft-mounted, three-phase, full wave silicon diode rectifiers.
Shunt Excitation:
The excitation system derives its power from the main output of the generator, eliminating the need for a separate excitation power source. This excitation system, combined with the Onan low reactance generator, comprise a system that provides sufficient short circuit current for selective clearing of instantaneous overcurrent devices
Phase Rotation: A (U), C (W), B (V)
Alternator Cooling: Direct drive centrifugal blower.

Outline Drawing 60 Hz: 15 RJC 50 Hz: 12.5 RJC



Obtain installation outline drawing 500-1502.

Voltage Selections

60 Hz, 1800 rpm, 3-phase, Reconnectible, Broad Range

- ☐ 120/208V ☐ 220/380V
- ☐ 127/220V ☐ 240/416V
- ☐ 139/240V ☐ 254/440V
- ☐ 120/240V* ☐ 277/480V

60 Hz, 1800 rpm, 1-phase, 4-Wire Reconnectible, Broad Range

- ☐ 120V ☐ 120/240V

60 Hz, 1000 rpm, 3-phase, Specific Voltage

- ☐ 347/600V

50 Hz, 1500 rpm, 3-phase, Reconnectible, Broad Range

- ☐ 110/190V ☐ 220/380V
- ☐ 115/200V ☐ 230/400V
- ☐ 120/208V ☐ 240/415V
- ☐ 127/220V ☐ 254/440V
- ☐ 110/220V*

50 Hz, 1500 rpm, 1-phase, 4-Wire Reconnectible, Broad Range

- ☐ 110V ☐ 110/220V

*Single-phase power can be taken in capacities up to 2/3 of the rated 3-phase kVA with broad range alternator.

This drawing is for informational purposes only. For specific construction details, obtain installation outline drawing from your distributor.

Unhoused Weight		Housed Weight	
Dry: 930 lbs	422 kg	Dry: 1080 lbs	490 kg
Wet: 967 lbs	439 kg	Wet: 1117 lbs	507 kg

OPERATING DATA		60 Hz (1800 rpm)				50 Hz (1500 rpm)			
Set Rating / Max. Surge	Gasoline	15	kW /	17	kW (max)	12.5	kW /	14	kW (max)
	Natural Gas	15	kW /	16	kW (max)	12.5	kW /	13	kW (max)
	Propane	15	kW /	17	kW (max)	12.5	kW /	14	kW (max)
Motor Starting	(all fuels)	52	kVA (Std)	108	kVA (Ext)	43	kVA (Std)	90	kVA (Ext)
Fuel Consumption	Gasoline	2.2	US gph	8	L/hr	2.0	US gph	8	L/hr
(at rated load)	Natural Gas	255	cfh	7.2	cu m/hr	255	cfh	7.2	cu m/hr
	Propane	110	cfh	3.1	cu m/hr	110	cfh	3.1	cu m/hr
Combustion Air		50	cfm	1.4	cu m/min	42	cfm	1.2	cu m/min
Exhaust Gas Flow		160	cfm	4.5	cu m/min	140	cfm	4.0	cu m/min
Exhaust Gas Temperature		1150	°F	621	°C	1100	°F	593	°C
Radiator Cooling Air		2750	cfm	77.9	cu m/min	2292	cfm	64.9	cu m/min
Alternator Cooling Air		160	cfm	4.5	cu m/min	133	cfm	3.8	cu m/min
Heat Rejected to Coolant		950	Btu/Min	1.0	MJ/Min	850	Btu/Min	0.9	MJ/Min
Heat Radiated to Room		520	Btu/Min	0.5	MJ/Min	450	Btu/Min	0.5	MJ/Min
Coolant Flow		24	Gal/Min	91	L/Min	20	Gal/Min	76	L/Min
Engine Power		34	bhp	25	kW	27	bhp	20	kW
Radiator Fan Load		1.5	hp	1.1	kW	0.9	hp	0.7	kW
BMEP		89	psi	616	kPa	91	psi	625	kPa
Piston Speed		1088	ft/min	5.53	m/s	907	ft/min	4.61	m/s
Overspeed Limit		2100 ±50 rpm				1850 ±50 rpm			

FULL LOAD CURRENTS (Amps @ Standby Rating)	120/208	127/220	139/240	120/240*	110/190	115/200	120/208	110/220*
	52	49	45	52	47	45	43	47
	240/416	254/440	277/480	347/600	220/380	230/400	240/415	254/440
	26	25	23	18	24	23	22	20

INSTALLATION DATA				
Maximum Coolant Friction Head	2.0	psi	14	kPa
Maximum Coolant Static Head	10	ft	3.1	m
Maximum Air Cleaner Restriction	15	in H2O	3.7	kPa
Maximum Exhaust Back Pressure	27	in H2O	6.8	kPa
Minimum Air Opening to Room	3.4	sq ft	0.3	sq m
Minimum Discharge Opening	2.3	sq ft	0.2	sq m
Maximum Restriction at Radiator Discharge (static)	0.25	in H2O	62	Pa

Derate for each 1000 ft (305 m) as follows:

	Gasoline	Natural Gas	Propane
Derate	5 %	5 %	4 %
Above (60 Hz)	3400 ft (1037 m)	2300 ft (702 m)	3300 ft (1007 m)
Above (50 Hz)	3300 ft (1007 m)	2200 ft (671 m)	3200 ft (976 m)

Derate 1% per 10°F (2% per 11°C) for ambient temperatures above 85°F (29°C).

15 RJC Spark-Ignited Generator Set *Specifications May Change Without Notice.* Onan Corporation 4/90 Bulletin **GSS-15A**

Control System

- **Monitors engine performance and AC power output.**
- **Controls generator set start and shutdown.**
- **Remote start terminals.**
- **DC panel lighting.**
- **Vibration Isolators protect control panel electronics and circuitry from generator set vibration.**

☐ Standard Control Features

- Fused DC controls
- Start-stop switch, 12-volt, 2 wire
- Exciter circuit breaker, manual reset
- Oil pressure guage
- Coolant temperature gauge
- Battery charge-rate ammeter

Generator Set Monitoring System

- Fault light (red) with alarm contact (manual reset) indicates engine shutdown for:
- High coolant temperature
- Low oil pressure

Generator Set Options

Engine

- ☐ 120-volt, 850 watt coolant heater
- ☐ 120-volt, 300 watt oil base heater
- ☐ Oil level maintainer
- ☐ Heavy duty air cleaner

Cooling Systems

- ☐ Remote radiator cooling
- ☐ Heat exchanger cooling
- ☐ Raw water cooling

Fuel Systems

- ☐ Gasoline
- ☐ Natural gas
- ☐ LP vapor
- ☐ LP liquid
- ☐ Natural gas/gasoline, manual changeover
- ☐ Gasoline/LP liquid, manual changeover
- ☐ LP vapor/gasoline, manual changeover
- ☐ Natural gas/LP vapor, automatic changeover
- ☐ Carburetor air preheater

Control Panel

- ☐ AC meter package
  - AC voltmeter
  - 3-phase voltage selector switch
  - Ammeter – one per phase
  - Frequency meter
  - Running time meter
- ☐ Main line circuit breakers
- ☐ SCR filter
- ☐ Switching regulator
- ☐ Anti-condensation heater
- ☐ Overspeed shutdown
- ☐ Alarm package
  - High engine temperature (with pre-warning)
  - Low oil pressure (with pre-warning)
  - Overcrank
  - Overspeed
  - Low coolant temperature
- ☐ Fault signal package
- ☐ Time delay – start
- ☐ Time delay – stop

Exhaust System

- ☐ Industrial-grade exhaust silencer
- ☐ Residential-grade exhaust silencer
- ☐ Critical-grade exhaust silencer

Alternator

- ☐ Anti-condensation heater
- ☐ Full single-phase output (3-phase alternator)
- ☐ Extended alternator shaft
- ☐ Severe environment insulation

Generator Set

- ☐ Battery charger, equalizer, float-type
- ☐ Battery
- ☐ Weather-protective enclosure with mounted silencer
- ☐ 2-year standby power warranty
- ☐ 5-year standby power warranty

Onan Corporation
1400 73rd Avenue N. E.
Minneapolis, MN 55432
612-574-5000
Telex: 275477
Fax: 612-574-8087

See your distributor for more information.

Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is opened.

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Cummins is a registered trademark of Cummins Engine Company
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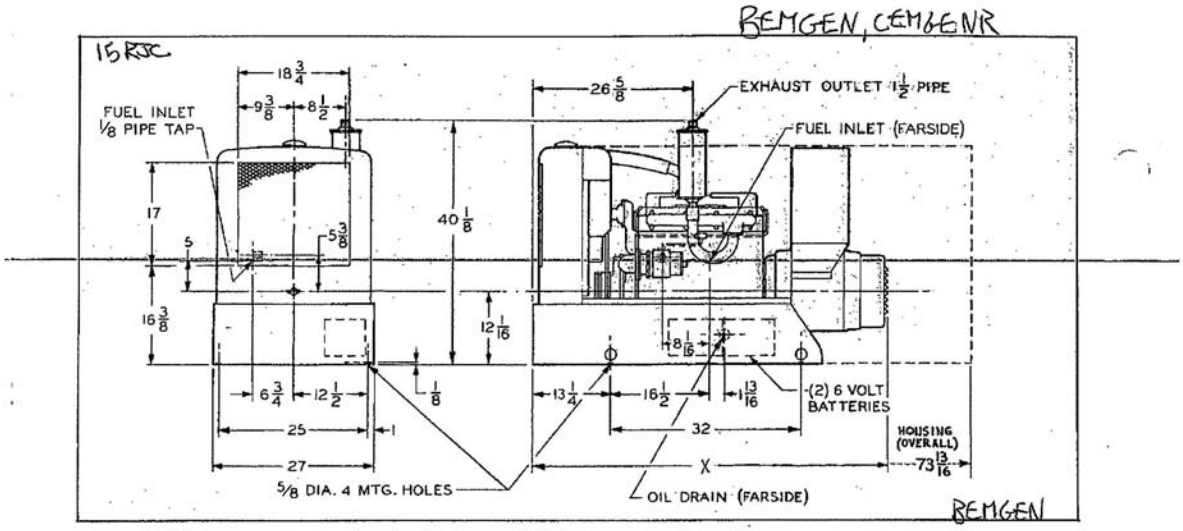
4/90 Bulletin GSS-15A



VARIABLE DIMENSIONS: Length "X" 12RJC 57⅜ in.; 15RJC, 62 in.

APPROXIMATE NET WEIGHTS: Unhoused 12RJC 1000-lb; 15RJC 1120-lb. Housed 12RJC 1100-lb; 15RJC 1220-lb.

ONAN GASOLINE ENGINE

Type: 4-Cycle, 4-cylinder, vertical inline design; 3¼ in. bore; 3⅝ in. stroke; 120 cubic inch piston displacement; 6.5:1 compression ratio. BMEP at rated continuous load is 88.0-psi. Piston speed is 1087-fpm. 33.6-cbhp maximum at 1800 rpm. ONAN RJ120 engine.

Cooling System: Radiator cooled; 3-gallon water capacity; belt driven pusher fan, cooling air volume 2750-cfm; Water Pump Capacity 24-gpm. Thermostat Temp control; High Water Temp Cut-out.

Fuel System: Horizontal carburetor; upturned air cleaner adapter and air cleaner with reusable polyurethane (oil wetted) element. Diaphragm fuel pump with bowl and screen filter; fuel lift, 6-ft. Automatic electric choke. Carburetor air heater, thermostat controlled. Combustion Air required: 50-cfm.

Fuel: Average fuel consumption at continuous, 60-cycle ratings—GASOLINE, 1.75-gph at 10kw; 2.25-gph at 15kw. NATURAL GAS (1000 Btu), 190 cu ft-hr at 10kw; 237 cu ft-hr at 13kw. PROPANE GAS, (2500 Btu), 70 cu ft-hr at 10kw; 92 cu ft-hr at 15kw. Gaseous fuel operation, optional adder.

Governor: Cam gear driven, adjustable, mechanical flyball. Stability ±0.2 cycles maximum, at rated continuous load. Speed regulation 5 percent no load to rated continuous load. Pressure lubricated.

Ignition System: 12-volt battery ignition. Radio suppressed. Automatic spark advance.

Lubrication System: Full pressure; crankshaft driven, gear pump. Full-flow replaceable filter with by-pass. Oil pressure gauge. Dipstick. Lube oil capacity is 6-qt plus ½-qt for filter. Low Oil Pressure Cut-out.

Starting System: Remote, 12-volt, 2-Wire, negative ground. Solenoid shift starter. Cranking Limiter. Use LTD (2-wire) series Automatic Load Transfer Control for Standby Service (optional adder).

Bearings: Three main bearings are, Clevite-25, line bored sleeve; Tri-metal connecting rod bearings. Replaceable precision inserts.

Connecting Rods and Crankshaft: Forged Steel rods drilled for lubrication and piston crown heat reduction. Ductile iron crankshaft.

Cylinders and Crankcase: Single unit alloy iron casting. Cylinders water jacketed. Removable, cast aluminum oil base.

Pistons: Trunk type, machined aluminum alloy. 3 rings—one cast iron oil control ring with expander; 2 cast iron torsion compression rings, top ring chrome faced.

Valves: Overhead, free to rotate. Intake valves are 4140 carbon steel. Intake seats are replaceable Ni-Resist No. 1. Exhaust valves have 2112 head with hard chrome-cobalt alloy facing. Exhaust seat inserts are hard chrome-cobalt alloy, repleceable. Aluminum-bronze valve guides.

ONAN MAGNECITER ALTERNATOR

Type: Revolving field, 4-pole, statically excited and voltage regulated. Rated for continuous duty. Drip proof design. Alternator rotor coupled to engine crankshaft through rigid, keyed, tapered coupling; secured by draw bolt.

Rotor Construction: Single piece laminations, keyed to rotor shaft. Amortisseur windings improve the AC wave form and reduce field heating with single-phase or unbalanced loads. Field coils are machine wound over molded nylon insulators.

Stator Construction: Segmented laminations, welded in a steel frame. Coil windings are wound into mylar insulated stator slots.

Exciter: Designed and mounted as integral part of alternator. No moving parts; toroidal reactors and silicon rectifiers. Nominal capacity; 600 watts at 40-volts. Capacity during transient period 2100-watts.

Voltage Wave Form: Voltage wave form deviation factor is less than 0.08 at any load or power factor within unit rating.

Overload Capacity: 150% of rated continuous amperes for 10 minutes or 125% of rated continuous amperes for 2 hours.

Brushes and Collector Rings: Low-zinc brass alloy, collector rings; machine finished to 20 micro inches. Brushes: Electro-graphitic.

Bearing: Double sealed ball bearing, lubricated for life.

Insulation System: Class B as defined by NEMA MG1-1.65.

Insulating Varnish: Conforming to MIL-V-1137.

Cooling: Direct drive centrifugal blower. Air required 125-cfm.

Temperature Rise: Temperature rise at rated continuous load is within NEMA MG1-22.40 definition.

UNIT PERFORMANCE

Battery Charging Output: 12-volt D.C., 2—5 amp, adjustable. Negative battery ground only.

Voltage Regulation: ±3%—Voltage dip and overshoot less than 12%, with recovery to steady-state operation in less than 2 seconds on application or removal of rated continuous load in one step.

Frequency Regulation: Droop governor—5% (3 cycles) maximum, no load to continuous load. Recovers to steady-state operation in less than 2 seconds on application or removal of rated load in one step.

Radio Interference Reduction: Exceeds requirements for most civilian and commercial applications.

OPTIONAL ACCESSORIES

Automatic (LTD) Load Transfer Controls • Two, 6-volt, 105 amp-hr Starting Batteries required • Water Jacket (tank type) Heaters • Water Cooled Manifold for use with Heat Exchanger or City Water Cooling • Water Flow Regulator • Flexible Water Lines • Air Discharge Duct Adapter • Fuel Tanks • Fuel Lines and Fittings • Gas or Combination Gas-Gasoline Carburetion • Special Mufflers (commercial, residential, critical) • AC Instruments and Controls • Special Safety and Warning Devices.

Specifications May Change Without Notice

CEMGENS

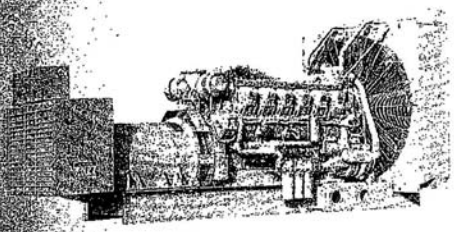
CEMGENS

CATERPILLAR®

Generator Set

3512
Standby Power

1000-1250 kW 60 Hz



Shown with
Optional Equipment

SPECIFICATIONS

V-12, 4-Stroke-Cycle Watercooled Diesel
Bore—mm (in) 170 (6.7)
Stroke—mm (in) 190 (7.5)
Displacement—L (cu in) 51.8 (3158)
Compression Ratio 13.5:1

CATERPILLAR ENGINE FACILITIES ISO 9001 CERTIFIED

FEATURES

■ **CAT DIESEL GENERATOR SETS**
Factory designed, certified prototype tested with torsional analysis. Production tested and delivered to you in a package that is ready to be connected to your fuel and power lines. EPG Designer computer sizing available. Supported 100% by your Caterpillar dealer with warranty on parts and labor. Extended warranty available in some areas. The generator set was designed and manufactured in an ISO 9001 compliant facility. Generator set and components meet or exceed the following specifications: AS1359, AS2789, ABQSM TM1, BS4999, DIN6271, DIN6280, EGSA 101P, JEM1359, IEC 34-1, ISO3046/1, ISO DIS8528, NEMA MG1-22.

■ **RELIABLE, FUEL EFFICIENT DIESEL**
The compact, four-stroke-cycle diesel engine combines durability with minimum weight while providing dependability and economy. The fuel system operates on a variety of fuels.

■ **CATERPILLAR SR4 GENERATOR**
Single-bearing, wye-connected, static regulated, brushless permanent magnet excited generator designed to match the performance and output characteristics of the Caterpillar diesel engine that drives it.

■ **EXCLUSIVE CATERPILLAR VOLTAGE REGULATOR**
Three-phase sensing and Volts per Hertz regulation give precise control, excellent block loading, and constant voltage in the normal operating range.

CATERPILLAR® SR4 GENERATOR

Type ..... Brushless, revolving field, solid-state exciter
Construction ..... Single bearing, close coupled
Three phase ..... Wye connected
Insulation ..... Class F with tropicalization and antiabrasion
Enclosure ..... Drip proof IP 22
Overspeed capability 150%
Paralleling capability ..... standard with adjustable voltage droop
Wave form ..... Less than 5% deviation
Voltage regulator ..... 3-phase sensing with Volts-per-Hertz
Voltage regulation ..... Less than ± 1/2%
Voltage gain ..... Adjustable to compensate for engine speed droop and line loss
TIF ..... Less than 50
THF ..... Less than 3%

CATERPILLAR CONTROL PANEL

24 Volt DC Control
Vibration isolated
NEMA 1, IP 22 enclosure
Dead front
Lockable hinged door
Generator instruments meet ANSI C-39-1

Voltages Available
60 Hz
139/240, 277/480,
346/600, 4160

(Adjustable a minimum of ±10%)
Other voltages available – consult your Caterpillar dealer.
Some voltages require derating

CATERPILLAR®

3512 GENERATOR SET

STANDARD EQUIPMENT

Engine
Aftercooler
Air cleaner
Breather, crankcase
Cooler, lubricating oil
Exhaust fitting and flange
Filters, right hand
fuel, full flow
lubricating oil, full flow
Flywheel housing
Governor
2301A, speed control
Lifting eyes
Manifold, exhaust, dry
Pumps,
fuel transfer, gear driven
lubricating oil, gear driven
jacket water, gear driven
Rails, mounting
Shutoff, manual
Starting, electric, 24 Volt DC
Turbochargers
Vibration damper

Generator
SR4 brushless with VR3 voltage regulator

ELECTRONIC MODULAR CONTROL PANEL (EMCP)

Standard Generator Controls and Monitoring:
Ammeter/voltmeter phase selector switch
Digital ammeter, voltmeter, frequency meter
Selector switch
Voltage adjust rheostat
Standard Engine Controls and Monitoring:
Automatic/manual start-stop control
Cooldown timer
Cycle cranking
DC voltmeter
Engine control switch for: off/reset, auto start, manual start, stop
Emergency stop pushbutton
Shutoffs with LED indicators for:
High coolant temperature
Low oil pressure
Overcrank
Overspeed

OPTIONAL EQUIPMENT

Engine
Air cleaner, heavy duty
Charging alternator
Cooling systems
Exhaust fittings
Governor, Woodward 3161, 2301A load share
Protection devices
Tachometer drive

Generator
Extension terminal box
Manual voltage control
MIL Std 461B
Permanent magnet excitation
RFI N level (VDE 875), BS800
Space heater
Temperature rise detectors

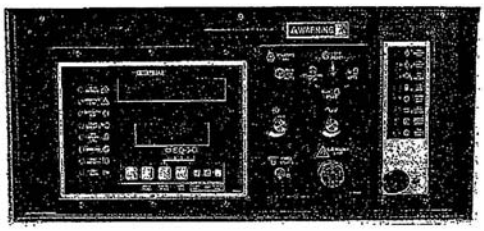
Switchgear
Automatic start/stop
Battery charger
Circuit breaker
Electric operated
Enclosure, floor standing NEMA 1
Main load buss
Manual
Paralleling
manual, permissive
Protective relays

Control Panel
Annunciator panel and prealarm module (meets NFPA 99/110 requirements)
Contacts for remote alarms
Enclosure, NEMA 12/IP 23
Illumination lights and switch
NFPA 110
Provision for:
auxiliary relay
charging voltmeter
cycle cranking
governor speed switcl
manual start/stop module
prealarm module
starting aid switch
synchronizing lights

Caterpillar® EMCP II

Electronic Modular Control Panel

The Electronic Modular Control Panel (EMCP) is a generator-mounted control panel, available on all Caterpillar packaged generator sets. It utilizes environmentally sealed, solid-state, microprocessor-based modules for engine control and AC metering. This new application of mature, high-tech electronics to generator monitoring provides more features, accuracy and reliability than present electro-mechanical and many competitive panel systems.



The EMCP provides these standard control and monitoring features, many of which are options on other panels:

- Automatic/manual start-stop engine control with programmable safety shutdowns and associated flashing LED indicators for low oil pressure, high coolant temperature, overspeed, overcrank and emergency stop
- Cycle cranking–adjustable 1-60 second crank/res periods
- Cooldown timer–adjustable 0-30 minutes
- Energized to run or shutdown fuel control system
- LCD digital readout for: Engine oil pressure; coolant temperature; engine rpm; system DC volt engine running hours; system diagnostic codes; generator AC volts; generator AC amps; and generator frequency
- Engine control switch
- Ammeter-voltmeter phase selector switch
- Emergency stop pushbutton
- Indicator/display test switch
- Voltage adjust potentiometer
- Rugged NEMA 1/IP 22 cabinet.

3512 GENERATOR SET

CATERPILLAR®

TECHNICAL DATA

3512 Standby Generator Sets			60 Hz–1800 RPM		
Rating Information	Power Rating @ 0.8 PF with Fan	kW	1000	1100	1250
		kV•A	1250	1375	1562
	Engine Bhp without Fan		1482	1592	1818
Physical Factors	Length	mm	5123	5148	5326
		in	201.7	202.6	209.7
	Width	mm	2092	2092	2092
		in	82.4	82.4	82.4
	Height	mm	2459	2459	2459
		in	96.8	96.8	96.8
	Weight	kg	10,215	10,700	10,815
		lb	22,520	23,600	23,850
	Generator Frame Size		685	687	689
Lubrication & Cooling Systems	Engine Lubricating Oil Capacity	L	333	333	333
		qts	352	352	352
	Engine Coolant Capacity with Radiator	L	335	335	335
		gal	88	88	88
	Standard Radiator Arrangement Data: Air Flow (Max @ Rated Speed)	m³/min	1594	1594	2012
		cfm	56,284	56,284	71,044
	Air Flow Restriction (after radiator)	kPa	0.12	0.12	0.12
		in water	0.5	0.5	0.5
	Ambient Air Capability (TMI)	Deg. C	55	50	49
		Deg. F	131	123	118
	Radiator Size		72/25	72/25	72/25
Exhaust System	System Backpressure (Max Allowable)	kPa	6.7	6.7	6.7
		in water	27	27	27
	Exhaust Flange Size (Internal Diameter)	mm	203	203	203
		in	8.0	8.0	8.0
Performance Data @ Rated Conditions	Fuel Consumption (100% load) with Fan per ISO3046/1: +5%, -0% tolerence	L/Hr	267.7	280.4	333.6
		gph	70.7	74.1	88.2
	Fuel Consumption (75% load) with Fan	L/Hr	204.6	219.7	248.2
		gph	54.0	58.0	65.6
	Fuel Consumption (50% load) with Fan	L/Hr	146.1	155.6	174.5
		gph	38.6	41.1	46.1
	Combustion Air Inlet Flow Rate	m³/min	97.3	101	106
		cfm	3436	3580	3732
	Exhaust Gas Flow Rate	m³/min	245	258	293
		cfm	8651	9096	10,335
	Heat Rejection to Coolant (total)	kW	660	689	824
		BTU/min	37,534	39,183	46,861
	Heat Rejection to Exhaust (total)	kW	1087	1138	1380
		BTU/min	61,818	64,718	78,480
	Heat Rejection to Atmosphere from Engine	kW	117	119	126
		BTU/min	6654	6768	7166
	Heat Rejection to Atmosphere from Generator	kW	62.7	62.8	67.2
		BTU/min	3565	3575	3825
	Exhaust Gas Stack Temperature	Deg. C	477	483	548
		Deg. F	891	902	1018
	Deration for Engine Altitude–3% per 305m (1000 ft) above	mm	2075	1650	875
		ft	6808	5413	2871

CATERPILLAR®

GEN SET PACKAGE PERFORMANCE DATA [1KZ00481]

(1KZ00481)-ENGINE (2GN01273)-GENERATOR (CMJ00228)-GENSET

SEPTEMBER 14, 2011

For Help Desk Phone Numbers Click here

Performance Number: DM6686

Change Level: 00

Sales Model: 3512 DITA
Combustion: DI
Aspr: TA
Engine Power:
1250 W/F EKW 1252 W/O F EKW 1,818 HP
Speed: 1,800 RPM
After Cooler: JWAC
Manifold Type: DRY
Governor Type: WDWRD
After Cooler Temp(F): 180
Turbo Quantity:
Engine App: GP
Turbo Arrangement:
Hertz: 60
Application Type: PACKAGE-DIE
Engine Rating: PGS
Strategy:
Rating Type: STANDBY
Certification:

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,250	100	1817	253.09	0.36	93.52	199.22	63.05	3,743.36	1,286.24	1,007.06	10,799.24
1,125	90	1638	228.15	0.35	82.71	195.44	57.75	3,549.13	1,186.7	928.58	9,665.63
1,000	80	1461	203.64	0.35	72.75	191.84	51.38	3,270.14	1,110.56	874.4	8,549.69
937.5	75	1373	191.31	0.35	68.47	190.04	47.5	3,114.76	1,080.14	863.6	8,069.41
875	70	1285	179.12	0.35	64.48	188.24	43.41	2,962.9	1,052.6	858.02	7,642.1
750	60	1111	154.76	0.36	56.64	185.36	35.33	2,673.32	1,009.4	845.96	6,826.33
625	50	937	130.54	0.36	48.85	182.84	27.6	2,390.81	971.6	829.22	6,024.69
500	40	768	106.89	0.38	41.26	180.5	20.49	2,118.88	929.66	808.52	5,240.7
375	30	595	82.96	0.39	33.52	177.98	14.13	1,843.43	865.22	777.02	4,442.59
312.5	25	508	70.78	0.41	29.59	176.72	11.28	1,705.7	825.26	755.78	4,040
250	20	420	58.45	0.43	25.65	175.64	8.65	1,571.5	779.72	730.94	3,633.88
125	10	241	33.65	0.51	17.73	174.2	4.98	1,377.27	654.62	629.06	2,909.93

Engine Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,250	100	48,055.1	7,165.6	81,437.7	47,031.4	10,009.1	12,909.5	77,058.7	200,636.9	213,717.0
1,125	90	42,254.3	6,881.3	70,234.3	38,842.1	8,871.7	10,407.2	69,438.1	177,263.4	188,808.0
1,000	80	37,363.5	6,596.9	61,248.9	32,188.3	7,791.2	8,075.5	61,988.2	156,904.0	167,197.5
937.5	75	35,202.5	6,540.0	57,666.1	29,970.4	7,336.2	6,995.0	58,234.8	147,975.4	157,586.4
875	70	33,155.1	6,426.3	54,253.9	28,207.5	6,938.1	5,971.3	54,481.3	139,217.5	148,316.7
750	60	29,003.6	6,198.8	47,600.1	24,738.4	6,085.1	4,037.8	47,088.3	121,929.0	129,890.8
625	50	24,852.1	5,914.5	41,116.9	21,326.2	5,232.0	2,331.7	39,752.1	104,811.2	111,635.6
500	40	20,814.4	5,687.0	34,918.1	17,970.9	4,435.9	966.8	32,529.6	88,262.0	94,005.9
375	30	16,833.5	5,402.6	28,776.2	14,501.8	3,582.8	-56.9	25,250.2	71,599.2	76,319.4
312.5	25	14,843.0	5,288.9	25,705.2	12,682.0	3,184.7	-511.8	21,553.7	63,239.3	67,390.8
250	20	12,852.6	5,118.3	22,634.2	10,919.0	2,729.8	-853.0	17,800.3	54,879.4	58,462.2

Performance Data

125	10	8,871.7	4,890.8	16,492.3	6,881.3	1,876.7	-1,308.0	10,236.6	37,932.2	40,434.5

Performance Data

EXHAUST Sound Data: 4.92 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	115	105	120	116	108	106	108	107	106
1,125	90	114	104	119	115	107	105	107	107	105
1,000	80	113	103	118	114	106	105	106	106	104
937.5	75	113	103	118	114	106	104	105	105	103
875	70	112	102	117	113	105	104	105	105	103
750	60	111	101	116	112	104	102	104	104	102
625	50	110	100	115	111	103	101	103	102	101
500	40	109	99	114	110	102	100	101	101	99
375	30	107	98	112	108	100	99	100	100	98
312.5	25	107	97	112	108	100	98	99	99	97
250	20	106	96	111	107	99	97	98	98	96
125	10	104	94	109	105	97	95	96	96	94

EXHAUST Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	101	93	109	104	95	93	94	94	91
1,125	90	101	92	109	103	94	93	93	93	90
1,000	80	100	91	108	102	93	92	92	92	89
937.5	75	99	91	107	101	93	91	92	92	89
875	70	99	90	107	101	92	91	91	91	88
750	60	98	89	106	100	91	90	90	90	87
625	50	96	88	104	99	90	88	89	89	86
500	40	95	87	103	97	89	87	88	88	85
375	30	94	85	102	96	87	86	87	86	84
312.5	25	93	85	101	95	87	85	86	86	83
250	20	92	84	100	94	86	84	85	85	82
125	10	90	82	98	92	84	82	83	83	80

Performance Data

EXHAUST Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	95	86	103	97	88	87	88	87	85
1,125	90	94	85	102	96	88	86	87	87	84
1,000	80	93	84	101	95	87	85	86	86	83
937.5	75	93	84	101	95	86	85	85	85	82
875	70	92	83	100	94	86	84	85	85	82
750	60	91	82	99	93	85	83	84	84	81
625	50	90	81	98	92	83	82	83	82	80
500	40	89	80	97	91	82	81	81	81	78
375	30	87	79	95	89	81	79	80	80	77
312.5	25	87	78	95	89	80	79	79	79	76
250	20	86	77	94	88	79	78	78	78	75
125	10	84	75	92	86	77	76	76	76	73

MECHANICAL Sound Data: 3.28 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	113	116	125	116	107	101	100	98	102
1,125	90	113	116	125	116	107	101	100	98	102
1,000	80	113	116	125	116	107	101	100	98	102
937.5	75	113	116	125	116	107	101	100	98	102
875	70	113	116	125	116	107	101	100	98	102
750	60	113	116	125	116	107	101	100	98	102
625	50	113	116	125	116	107	101	100	98	102
500	40	113	116	125	116	107	101	100	98	102
375	30	113	116	125	116	107	101	100	98	102
312.5	25	113	116	125	116	107	101	100	98	102
250	20	113	116	125	116	107	101	100	98	102
125	10	113	116	125	116	107	101	100	98	102

Performance Data

MECHANICAL Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
1,250	100	100	102	112	102	94	89	89	86	90
1,125	90	100	102	112	102	94	89	89	86	90
1,000	80	100	102	112	102	94	89	89	86	90
937.5	75	100	102	112	102	94	89	89	86	90
875	70	100	102	112	102	94	89	89	86	90
750	60	100	102	112	102	94	89	89	86	90
625	50	100	102	112	102	94	89	89	86	90
500	40	100	102	112	102	94	89	89	86	90
375	30	100	102	112	102	94	89	89	86	90
312.5	25	100	102	112	102	94	89	89	86	90
250	20	100	102	112	102	94	89	89	86	90
125	10	100	102	112	102	94	89	89	86	90

MECHANICAL Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,250	100	93	96	105	96	87	83	83	80	84
1,125	90	93	96	105	96	87	83	83	80	84
1,000	80	93	96	105	96	87	83	83	80	84
937.5	75	93	96	105	96	87	83	83	80	84
875	70	93	96	105	96	87	83	83	80	84
750	60	93	96	105	96	87	83	83	80	84
625	50	93	96	105	96	87	83	83	80	84
500	40	93	96	105	96	87	83	83	80	84
375	30	93	96	105	96	87	83	83	80	84
312.5	25	93	96	105	96	87	83	83	80	84
250	20	93	96	105	96	87	83	83	80	84
125	10	93	96	105	96	87	83	83	80	84

EMISSIONS DATA

Certification:

To properly apply this data you must refer to performance parameter DM1176 for additional information...

REFERENCE EXHAUST STACK DIAMETER	10 IN
WET EXHAUST MASS	17,242.3 LB/HR
WET EXHAUST FLOW (1,005.80 F STACK TEMP)	10,806.30 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,545.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,247.89 STD CFM
FUEL FLOW RATE	93 GAL/HR

Performance Data

RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,250	100	1817	47.7400	9.3300	.5300	1.0800	11.4000	2.9000	1.3200
937.5	75	1373	34.3900	4.8200	1.2800	.6000	11.8000	2.9000	1.2900
625	50	937	23.9100	3.0100	1.2500	.5700	12.7000	2.9000	1.3100
312.5	25	508	12.4800	2.6500	1.1000	.8000	13.8000	4.2000	1.3800
125	10	241	6.5600	2.9900	1.2600	.6300	15.1000	5.5000	1.5000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,250	100	1817	39.7800	5.1800	.4000	2,227.1	.7700	11.4000	2.9000	1.3200
937.5	75	1373	28.6600	2.6800	.9600	1,554.7	.4300	11.8000	2.9000	1.2900
625	50	937	19.9300	1.6700	.9400	1,101.7	.4100	12.7000	2.9000	1.3100
312.5	25	508	10.4000	1.4700	.8300	663.3	.5700	13.8000	4.2000	1.3800
125	10	241	5.4700	1.6600	.9500	391.2	.4500	15.1000	5.5000	1.5000

Performance Data

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp
984.25 F	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,791.6 hp	1,818.42 hp
1,640.42 F	1,818.42 hp	1,818.42 hp	1,818.42 hp	1,805.01 hp	1,748.69 hp	1,818.42 hp
3,280.84 F	1,818.42 hp	1,815.74 hp	1,755.4 hp	1,699.07 hp	1,646.77 hp	1,791.6 hp
4,921.26 F	1,768.81 hp	1,708.46 hp	1,652.14 hp	1,598.5 hp	1,548.88 hp	1,704.44 hp
6,561.68 F	1,662.86 hp	1,605.2 hp	1,552.9 hp	1,503.28 hp	1,456.35 hp	1,619.95 hp
8,202.1 F	1,562.29 hp	1,508.65 hp	1,459.03 hp	1,412.09 hp	1,369.18 hp	1,539.49 hp
9,842.52 F	1,467.08 hp	1,416.12 hp	1,369.18 hp	1,326.27 hp	1,284.7 hp	1,461.71 hp
10,498.69 F	1,429.53 hp	1,381.25 hp	1,335.66 hp	1,292.74 hp	1,252.51 hp	1,432.21 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	1979048	**Lube Oil Press @ Rated Spd(PSI):**	55.8
Effective Serial No:	1KZ00314	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,173.2
Primary Engine Test Spec:	0K3134	**Max Operating Altitude(FT):**	2,788.7
Performance Parm Ref:	TM5739	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM6686	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:	TM3097	**Turbocharger Model**	TV9211-1.7
Certification Ref:		**Fuel Injector**	1111775
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	13.5	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	180	**Unit Injector Timing (MM):**	86.8
Crankcase Blowby Rate(CFH):	907.6	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	8.1	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	**Peak Torque (LB/FT):**	--

Reference Number: DM6686 --

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER +/- 3%
EXHAUST STACK TEMPERATURE +/- 8%
GENERATOR POWER +/- 5%
INLET AIR FLOW +/- 5%
INTAKE MANIFOLD PRESSURE - GAGE +/- 10%
EXHAUST FLOW +/- 6%
SPECIFIC FUEL CONSUMPTION +/- 3%
FUEL RATE +/- 5%
HEAT REJECTION +/- 5%
HEAT REJECTION EXHAUST ONLY +/- 10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1349. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1349, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS

EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

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DEMGEN

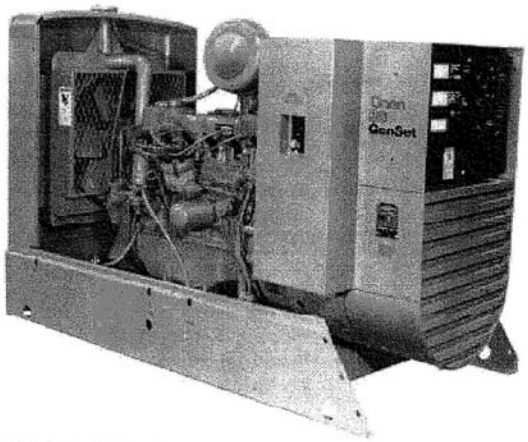
DEMGEN

Cummins

Onan

30 EK 60 Hz
25 EK 50 Hz
Spark-Ignited Generator Set

	STANDBY
60 Hz	30 kW 38 kVA
50 Hz	25 kW 31 kVA



Generator Set Features

- **Single-source design, manufacturing and testing of all set components and accessories by Onan Corporation.**
- **Accepts 100% of nameplate kW rating in one step, in compliance with NFPA 110, Paragraph 5-13.2.6.**
- **Engine torque-matched excitation system provides quick recovery from transient speed dips.**
- **Low reactance generator design offers low waveform distortion with non-linear loads and provides excellent motor starting capabilities.**

Standard Equipment

ENGINE
Multi-fuel capability – gasoline, natural gas, propane and combinations available.

ALTERNATOR
Brushless Onan AC alternator provides broad range reconnectible output.

CONTROL PANEL
Vibration isolated control with analog instrumentation.

VOLTAGE REGULATOR
Electronic voltage regulator utilizes asynchronous power transitor operation that provides immunity from SCR loads.

COOLING SYSTEM
High ambient 122° F (50° C) system.

SKID BASE
Supports the alternator and engine. Battery rack and cooling system mount to the skid base. Integral vibration isolation.

Generator Set Testing

The Prototype Test Support (PTS) program is our commitment to verifying the integrity of our designs and products.

Before the generator sets are put into production, prototype models are subjected to demanding tests with typical/atypical loads and transients anticipated in service.

Production models earn the PTS seal only after meeting the performance criteria established by the program.

Single-Source Warranty

All generator set components and systems are covered by a limited one-year warranty. Optional two- and five-year extended programs are available.

Standard Models are CSA certified.

Generator Set Performance

Voltage Regulation
At constant load, from no load to 100% load will be within ± 2%.
Random Voltage Variation
At constant load, from no load to 100% load will not exceed ± 1% of its mean value.
Frequency Regulation
Under varying loads from no load to 100% load: 5% maximum
Random Frequency Variation
Will not exceed ± 0.5% of its mean value for constant loads from no load to full load.
Electromagnetic Interference Attenuation
Meets requirements of most industrial and commercial applications.

AC Waveform Total Harmonic Distortion
Less than 5% total no load to full load, and less than 3% for any single harmonic
Telephone Influence Factor (TIF)
Less than 50 per NEMA MG1-22.43.
Telephone Harmonic Factor (THF) Less than 3.
Alternator Temperature Rise
At rated load is less than 100° C at standby rating, per NEMA MG1.22.40, IEEE115 and IEC 34–1.
Radio Interference
Alternator and voltage regulator meet the provisions of BS.800 and VDE Class G and N.
Ratings and Performance
The standby power rating is applicable for the duration of normal power interruption. No overload is available at this rating.

Engine: 6-cylinder, in-line, multi-fuel

Model: Ford CSG-649
Design: 4-cycle, water-cooled, natural aspiration
Bore: 4.0" (102 mm) **Stroke:** 3.98" (101 mm)
Piston Displacement: 300 cubic inches (4.9 liters)
Compression Ratio: 8.0:1
Starting: 12-volt, negative ground
Cranking Current: 155 amps at ambient temperature of 32° F (0° C).
65 -amp Battery Charging Alternator
Cast Iron Cylinder Block
Governor: Mechanical, adjustable, ± 5% speed regulation.

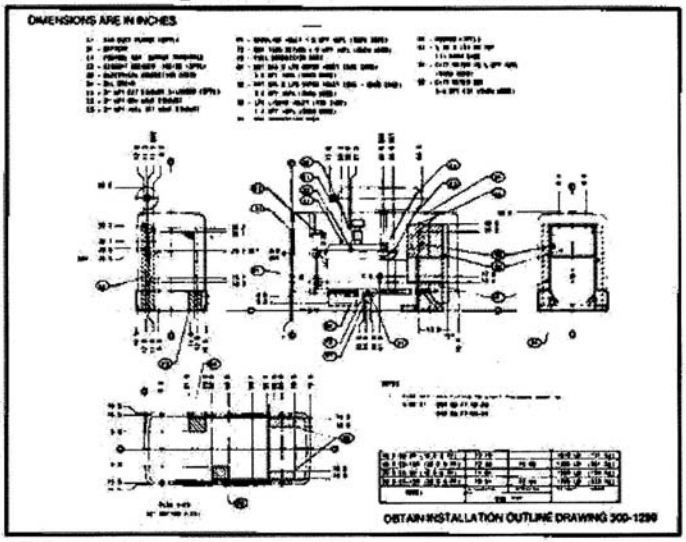
Fuel System: Gasoline – Downdraft carburetor with anti-dieseling solenoid; Automatic choke; Mechanical fuel pump; Fuel lift 6 feet (1.8 meters).
Natural gas/propane – IMPCO carburetion.
Dry-Element Air Cleaner
Lube Oil Capacity: 7 US quarts (7 liters)
Lube Oil Filter: Single Spin-On, Full Flow
Typical Lube Oil Consumption:
4 US quarts (4 liters) – per 100 Hours
Cooling System
High Ambient 122° F (50 ° C) Radiator.
Coolant Capacity
20 US quarts (19 liters)

Alternator: Onan

Design:
Revolving field, single bearing, 4-pole, brushless, drip-proof construction. Standard 105° C temperature rise at standby power rating. Class F insulation system per NEMA MG1–1.65 and BS2757. The main alternator and exciter insulation systems are suitable for typical standby applications.
Stator:
Skewed stator and 2/3 pitch windings minimize field heating and voltage harmonics.
Rotor:
Dynamically balanced assembly. Direct coupled to engine by a flexible drive disc. Complete amortisseur (damper) windings help minimize voltage deviations and heating effects under unbalanced loads. The rotor is supported by a pre-lubricated, maintenance-free ball bearing.
Phase Rotation: A (U), C (W), B (V)
Alternator Cooling: Direct drive centrifugal blower

Torque-Matched Voltage Regulation:
The voltage regulator provides torque-matched underfrequency compensation to optimize motor starting performance and assist the engine during transient load conditions. Asynchronous power transistor operation provides immunity from SCR tracking when applied to non-linear loads. The brushless exciter armature powers the main alternator field winding through shaft-mounted, three-phase, full wave silicon diode rectifiers.
Shunt Excitation:
The excitation system derives its power from the main output of the generator, eliminating the need for a separate excitation power source. This excitation system, combined with the Onan low reactance generator, comprise a system that provides sufficient short circuit current for selective clearing of instantaneous overcurrent devices.

Outline Drawing 60 Hz: 30 EK 50 Hz: 25 EK



Voltage Selections

60 Hz, 1800 rpm, 3-phase, Reconnectible Broad Range
- ☐ 120/208V ☐ 220/380V
- ☐ 127/220V ☐ 240/416V
- ☐ 139/240V ☐ 254/440V
- ☐ 120/240V* ☐ 277/480V

60 Hz, 1800 rpm, 1-phase Specific Voltage
- ☐ 120/240V

60 Hz, 1800 rpm 3-phase, Specific Voltage
- ☐ 347/600V

50 Hz, 1500 rpm, 3-phase, Reconnectible, Broad Range
- ☐ 110/190V ☐ 220/380V
- ☐ 115/200V ☐ 230/400V
- ☐ 120/208V ☐ 240/415V
- ☐ 127/220V ☐ 254/440V
- ☐ 110/220V*

50 Hz, 1500 rpm, 1-phase, Specific Voltage
- ☐ 110/220V

*Single-phase power can be taken in capacities up to 2/3 of the rated 3-phase kVA with broad range alternator.

This drawing is for informational purposes only. For specific construction details, obtain installation outline drawing from your distributor.

	Unhoused Weight	Housed Weight
Dry:	1395 lbs 633 kg	1700 lbs 772 kg
Wet:	1449 lbs 658 kg	1754 lbs 796 kg

OPERATING DATA		60 Hz (1800 rpm)		50 Hz (1500 rpm)	
Set Rating / Max. Surge	Gasoline	30 kW /	48 kW (max)	25 kW /	40 kW (max)
	Natural Gas	30 kW /	39 kW (max)	25 kW /	32 kW (max)
	Propane	30 kW /	45 kW (max)	25 kW /	38 kW (max)
Motor Starting	(all fuels)	115 kVA (Std)	152 kVA (Ext)	95 kVA (Std)	122 kVA (Ext)
Fuel Consumption	Gasoline	4.9 US gph	19 L/hr	4.9 US gph	18 L/hr
(at rated load)	Natural Gas	600 cfh	17.0 cu m/hr	465 cfh	13.2 cu m/hr
	Propane	245 cfh	6.9 cu m/hr	195 cfh	5.5 cu m/hr
Combustion Air		100 cfm	2.8 cu m/min	NA cfm	NA cu m/min
Exhaust Gas Flow		320 cfm	9.1 cu m/min	290 cfm	8.2 cu m/min
Exhaust Gas Temperature		1150 °F	621 °C	1100 °F	593 °C
Radiator Cooling Air		5335 cfm	151.1 cu m/min	4450 cfm	126.0 cu m/min
Alternator Cooling Air		1000 cfm	28.3 cu m/min	833 cfm	23.6 cu m/min
Heat Rejected to Coolant		2650 Btu/Min	2.8 MJ/Min	2300 Btu/Min	2.4 MJ/Min
Heat Radiated to Room		945 Btu/Min	1.0 MJ/Min	850 Btu/Min	0.9 MJ/Min
Coolant Flow		34 Gal/Min	129 L/Min	28 Gal/Min	106 L/Min
Engine Power		82 HP	61 kW	67 HP	50 kW
Radiator Fan Load		2.5 HP	1.9 kW	1.5 HP	1.1 kW
BMEP		71 psi	493 kPa	68 psi	470 kPa
Piston Speed		1194 ft/min	5.07 m/s	995 ft/min	5.05 m/s
Overspeed Limit		2100 ±50 rpm		1850 ±50 rpm	

FULL LOAD CURRENTS (Amps @ Standby Rating)	120/208	127/220	139/240	120/240*	110/190	115/200	120/208	110/220*
	104	98	90	104	95	90	87	95
	240/416	254/440	277/480	347/600	220/380	230/400	240/415	254/440
	52	49	45	38	47	45	43	41

INSTALLATION DATA				
Maximum Coolant Friction Head	2.0	psi	14	kPa
Maximum Coolant Static Head	10	ft	3.1	m
Maximum Air Cleaner Restriction	15	in H2O	3.7	kPa
Maximum Exhaust Back Pressure	20	in H2O	5.1	kPa
Minimum Air Opening to Room	4.8	sq ft	0.4	sq m
Minimum Discharge Opening	3.2	sq ft	0.3	sq m
Maximum Restriction at Radiator Discharge (static)	0.25	in H2O	62	Pa

Derate for each 1000 ft (305 m) as follows

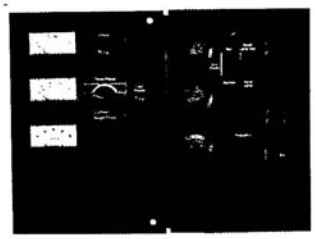
	Gasoline	Natural Gas	Propane
Derate	4 %	5 %	4 %
Above (60 Hz)	10400 ft (3172 m)	5600 ft (1708 m)	9300 ft (2837 m)
Above (50 Hz)	10200 ft (3111 m)	5500 ft (1678 m)	9300 ft (2837 m)

Derate 1% per 10°F (2% per 11°C) for ambient temperatures above 85°F (29°C).

EK Spark-Ignited Generator Set — *Specifications May Change Without Notice.* — Onan Corporation 4/90 Bulletin GSS-30A

Detector™ Control System

- **Monitors engine performance and AC power output.**
- **Controls generator set start and shutdown.**
- **Automatic remote start.**
- **DC panel lighting.**
- **Vibration Isolators protect control panel electronics and circuitry from generator set vibration.**
- **Analog Instrumentation displays performance trends Rugged. Non-fluctuating, easy to read.**



Control panel shown includes optional AC Meters and 12-Light Monitoring System.

☐ Standard Control Features

- Run-stop-remote switch
- Remote starting, 12-volt, 2 wire
- Coolant temperature gauge
- Field circuit breaker
- DC voltmeter
- Oil pressure gauge
- Running time meter
- Fault reset switch
- Lamp test switch
- Cycle cranking
- 7-light engine monitor with individual 1/2 amp relay signals and a common alarm contact for each of the following conditions:

RUN (green light)
PRE-WARNING FOR LOW OIL PRESSURE (yellow light)
PRE-WARNING FOR HIGH COOLANT TEMP (yellow light)
LOW OIL PRESSURE SHUTDOWN (red light)
HIGH COOLANT TEMPERATURE SHUTDOWN (red light)
OVERCRANK SHUTDOWN (red light)
OVERSPEED SHUTDOWN (red light)

☐ Optional NFPA 110 12-Light Monitor

Engine monitor with individual 1/2 amp relay signals and common external alarm contact for each of the following conditions:

RUN (green light)
PRE-WARNING FOR LOW OIL PRESSURE (yellow light)
PRE-WARNING FOR HIGH COOLANT TEMP (yellow light)
LOW OIL PRESSURE SHUTDOWN (red light)
HIGH COOLANT TEMPERATURE SHUTDOWN (red light)
OVERCRANK SHUTDOWN (red light)
OVERSPEED SHUTDOWN (red light)
SWITCH OFF (flashing red light – indicates generator set not in automatic start mode)
LOW COOLANT TEMPERATURE (yellow light)
LOW FUEL (yellow light)
TWO CUSTOMER SELECTED FAULTS (red light)

Generator Set Options

Engine

- ☐ 120-volt, 1500 watt coolant heater
- ☐ 240-volt, 1500 watt coolant heater
- ☐ Electronic governor

Cooling Systems

- ☐ Remote radiator, dry manifold
- ☐ Heat exchanger, wet manifold
- ☐ Raw water, wet manifold
- ☐ Raw water, dry manifold

Fuel Systems

- ☐ Gasoline
- ☐ Natural gas
- ☐ LP vapor
- ☐ LP liquid
- ☐ Natural gas/gasoline, manual changeover
- ☐ LP liquid/gasoline, manual changeover
- ☐ Natural gas/LP vapor, automatic changeover
- ☐ Natural gas/LP vapor, manual changeover
- ☐ Natural gas/LP liquid, automatic changeover
- ☐ Natural gas/LP liquid, manual changeover

Control Panel

- ☐ AC meter package
  - AC ammeter (dual range)
  - AC voltmeter (dual range)
  - Voltmeter/ammeter phase selector switch
  - Frequency meter
  - AC rheostat for ± 5% voltage adjustment
- ☐ Run relay package
- ☐ Remote fault signal dry contact relay package
- ☐ Low coolant level shutdown
- ☐ Anti condensation heater
- ☐ Oil temperature gauge
- ☐ Tachometer
- ☐ Wattmeter
- ☐ Time delay/start-stop
- ☐ Emergency stop

Exhaust System

- ☐ Industrial-grade exhaust silencer
- ☐ Residential-grade exhaust silencer
- ☐ Critical-grade exhaust silencer

Alternator

- ☐ Anti-condensation heater
- ☐ Full single-phase output (3-phase alternator)
- ☐ Severe environment insulation

Generator Set

- ☐ Mainline circuit breaker
- ☐ Battery charger, equalizer, float-type
- ☐ Batteries
- ☐ Remote annunciator
- ☐ Weather-protective enclosure with mounted silencer
- ☐ Safety hasps for enclosure
- ☐ 2-year standby power warranty
- ☐ 5-year standby power warranty
- ☐ Export box packaging

Onan Corporation
1400 73rd Avenue N. E.
Minneapolis, MN 55432
612-574-5000
Telex: 275477
Fax: 612-574-8087

See your distributor for more information.

Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is opened.

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4/90 Bulletin GSS-30A

DEMGEN

Specifications 30 kW EK

confirmed this in Paperwork RJ

ENGINE DETAILS

Engine Manufacturer	Ford
Engine Series	CSG-649I
Number of Cylinders	6
Displacement	300 in³ (4.9 litre)
Power @ 1800 r/min	82 Bhp (61.1 kW)
Compression Ratio	8:1
Bore	4.00 inch (101.6 mm)
Stroke	3.98 inch (101.09 mm)
Fuel	Gas/Gaso
Battery Voltage	12
Battery Group—One 12-Volt, 74 A.H. (266 kC)	Type 60
Starting Method	Solenoid Shift
Governor Regulation	5% Max. No Load—Full Load
Battery Charging Current	35-Amperes Max

GENERATOR DETAILS

Type	UR15 60 Hz UR515 50 Hz
Rating	
60 Hertz Continuous Standby	30 kW (37.5 kVA)
50 Hertz Continuous Standby	25 kW (31.25 kVA)
AC Voltage Regulation	±2%
60 Hertz r/min	1800
50 Hertz r/min	1500
Output Rating	0.8 PF
AC Frequency Regulation	3 Hz Max

CAPACITIES AND REQUIREMENTS

Cooling System, Engine and Radiator	20 quarts (19 litres)
Engine Oil Capacity (Filter, Lines, Crankcase)	7 quarts (6.6 litres)
Exhaust Connection (inches pipe thread)	2

AIR REQUIREMENTS (1800 r/min)

Engine Combustion	100 cfm (2.83 m³/min)
Radiator Cooled Engine	5,334 cfm (151.1 m³/min)
Alternator Cooling Air (1800 r/min)	1,000 cfm (28.30 m³/min)
(1500 r/min)	833 cfm (23.32 m³/min)
Fuel Consumption at Rated Load	
Gasoline (Regular)	4.9 gal/hr (5.15 cm³/s)
Natural Gas (1000 BTU/ft³ [37.25 MJ/m³])	600 ft³/hr (0.28 m³/min)
LPG (2500 BTU/ft³ [93.1 MJ/m³])	245 ft³/hr (0.12 m³/min)

GENERAL

Height	45.56 inches (1.16 m)
Width	33.00 inches (0.84 m)
Length	71.81 inches (1.82 m)
Approximate Weight (Mass)	3 phase 1,395 lb (633 kg)
(Extended Stack)	1 phase 1,550 lb (703 kg)

3

DMREMGEN

DMREMGEN

Alternator Specifications

Specifications	Fast-Response™ Generator
Manufacturer	Kohler
Type	4-Pole, Rotating Field
Exciter type	Brushless, Permanent Magnet
Leads: quantity, type	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1-1.66
Material	Class H
Temperature rise	130° C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no load to full load	±2%
Unbalanced load capability	100% of Rated Standby Power
One-step load acceptance	100% of Rating
Peak motor starting kVA:	(35% dip for 480 V, 60 Hz and 380 V, 50 Hz)
4P10	255 (60Hz), 180 (50Hz)
4S7	270 (60Hz), 190 (50Hz)

- Complies with NEMA, IEEE, and ANSI standards for temperature rise.
- Sustains short-circuit current of up to 300% of rated current for up to 10 seconds.
- Sustains short-circuit current enabling downstream circuit breakers to trip without collapsing the generator field.
- Self-ventilation, dripproof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Solid-state, volts-per-hertz voltage regulator with ±2% no-load to full-load regulation.
- Fast-Response™ brushless alternator with brushless exciter for excellent load response.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	Ford	
Engine: model, type	LSG-875, 4-Cycle, Natural Aspiration	
Cylinder arrangement	V-8	
Displacement, cu. in. (L)	460 (7.538)	
Bore and stroke, in. (mm)	4.36 (111.0) x 3.85 (98.0)	
Compression ratio	8.0:1	
Piston speed, ft./min. (m/sec.)	1155 (5.86)	962 (4.88)
Main bearings: quantity, type	5, Replaceable Insert	
Rated rpm	1800	1500
Max. power at rated rpm, HP (kW)	126 (94)	104 (76)
Cylinder head material	Cast Iron Alloy	
Piston type and material	Autothermic Aluminum Alloy	
Crankshaft material	Nodular Cast Iron	
Valves material	Forged Steel	
Governor: type, make/model	Electronic, Barber Colman	
Frequency regulation, no load to full load	Isochronous	
Frequency regulation, steady state	±0.5%	
Air cleaner type, all models	Dry	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust flow at rated kW, cfm (m^3/min.)	580 (16.4)	480 (13.6)
Exhaust temperature at rated kW, dry exhaust, °F (°C)	1200 (650)	
Maximum allowable back pressure, in. Hg (kPa)	2.0 (6.8)	
Exhaust outlet size at hookup, in. (mm)	3 (76.2) OD	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Ignition system	Electronic, Breakerless	
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	12	
Ampere rating	37	
Starter motor rated voltage (DC)	12	
Recommended battery cold cranking amps (CCA) rating for 0°F (-18°C)	630	
Batteries, quantity	1	
Battery voltage (DC)	12	
Rolling current at 32°F (0°C)	—	

Fuel

Fuel System	60 Hz	50 Hz
Fuel type	LP Gas or Natural Gas Vapor	
Fuel supply line inlet	1 NPTF	
Natural gas/LPG fuel supply pressure oz./in.^{2} (in. H_2O)	4-6 (7-11)	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, qts. (L)	8.0 (7.6)	
Oil pan capacity with filter, qts. (L)	9.0 (8.5)	
Oil filter: quantity, type	1, Cartridge	

G4-25 (60RZ) 8/95g

DMIREMGEN

Application Data

Kohler 60RZ

Cooling (Standard Radiator)

Cooling System	60 Hz	50 Hz
Ambient temperature, °F (°C)	110 (43)	
Engine jacket water capacity, gal. (L)	4.0 (15.1)	
Radiator system capacity, including engine, gal. (L)	6.9 (26.1)	
Engine jacket water flow, gpm (Lpm)	53 (201)	44 (167)
Heat rejected to cooling water at rated kW, dry exhaust Btu/min.	3120	2600
Water pump type	Centrifugal	
Fan diameter, including blades, in. (mm)	23.6 (599)	
Fan, HP (kW)	4.5 (3.4)	2.6 (1.9)
Max. restriction of cooling air, intake and discharge side of radiator, in. H_2O (kPa)	0.5 (0.125)	

Fuel Consumption	60 Hz	50 Hz
Natural Gas, cfh (m^3/hr.) at % load		
100%	960 (27.2)	830 (23.5)
75%	800 (22.7)	660 (18.7)
50%	610 (17.3)	500 (14.2)
25%	420 (11.9)	360 (10.2)
LP Gas, cfh (m^3/hr.) at % load		
100%	420 (11.9)	360 (10.2)
75%	350 (9.9)	300 (8.5)
50%	280 (7.9)	230 (6.5)
25%	210 (5.9)	150 (4.2)

Cooling (Optional Systems)

High Ambient Radiator System	60 Hz	50 Hz
Ambient temperature, °F (°C)	122 (50)	
Engine jacket water capacity, gal. (L)	4.0 (15.1)	
Radiator system capacity, including engine, gal. (L)	7.5 (28.4)	
Engine jacket water flow, gpm (Lpm)	53 (201)	44 (166.5)
Heat rejected to cooling water at rated kW, dry exhaust Btu/min.	3120	2600
Water pump type	Centrifugal	
Fan diameter, including blades, in. (mm)	23.6 (599)	
Fan, HP (kW)	4.5 (3.4)	2.6 (1.9)
Max. restriction of cooling air, intake and discharge side of radiator, in. H_2O (kPa)	0.5 (0.125)	

Remote Radiator System*	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes: Water inlet, in. (mm) ..... Water outlet, in. (mm)	 2.00 (51) ID Hose 1.50 (38) ID Hose	
Static head allowable above engine, ft. (m)	17.0 (4.32)	

*Contact your local distributor for cooling system options and specifications based on your specific application.

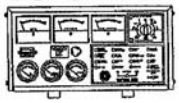
City Water Cooling (CWC) System	60 Hz	50 Hz
Exhaust manifold type	Dry or Water Cooled	
System capacity, gal. (L)	6.6 (25.0)	
City water consumption, gpm (Lpm) at 50°F (10°C)	7.4 (28.0)	
Connection sizes: Water inlet, in. (mm) ..... Water outlet, in. (mm)	 0.75 (19) NPT 0.5 (12.7) NPT	

Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, cfm (m^3/min.)	8400 (238)	6800 (193)
Cooling air required for gen. set when equipped with CWC or remote radiator, based on 25°F (14°C) rise and ambient temp. of 85°F (29°C), cfm (m^3/min.)	5100 (144)	4400 (125)
Combustion air, cfm (m^3/min.)	185 (5.2)	155 (4.4)
Heat rejected to ambient air: Engine Btu/min. (kW) ..... Generator Btu/min. (kW)	 1760 (30.9) 440 (7.7)	 1510 (26.5) 390 (6.9)

G4-25 (60RZ) 8/96g

Controllers



Standard Controller

Decision-Maker™ 3+, 16-Light Controller
Audio/visual annunciation with NFPA-110, Level 1 capability
Microprocessor logic with AC meters and engine gauges
Compatible with 12-volt and 24-volt engine electrical systems
Remote start, prime power, and remote annunciation capability

Optional Controllers

Decision-Maker™ 340 Controller
Audio/visual annunciation with NFPA-110, Level 1 capability
Programmable microprocessor logic with digital display
Compatible with 12-volt and 24-volt engine electrical systems
Remote start, prime power, remote annunciation, and remote communication capability

Decision-Maker™ 3+, 7-Light Controller
Audio/visual annunciation with NFPA-110, Level 2 capability
Microprocessor logic with AC meters and engine gauges
Compatible with 12-volt and 24-volt engine electrical systems
Remote start, prime power, and remote annunciation capability

Decision-Maker™ 1 Controller
Provides remote or automatic start with NFPA compliance
Uses single-light annunciation with basic control functions
Relay logic with three models—standard, standard with engine gauges, and expanded with AC meters and engine gauges
Compatible with 12-volt engine electrical systems only

NOTE: See the respective controller spec sheet for additional controller features and accessories.

GEEMGEN

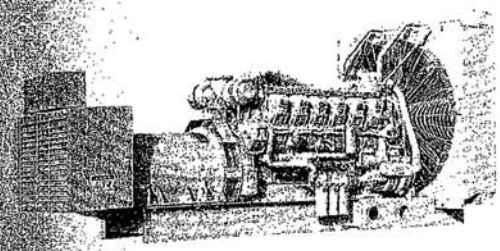
GEEMGEN

CATERPILLAR®

Generator Set

3512
Standby Power

1000-1250 kW 60 Hz



Shown with
Optional Equipment

SPECIFICATIONS

V-12, 4-Stroke-Cycle Watercooled Diesel
Bore—mm (in) 170 (6.7)
Stroke—mm (in) 190 (7.5)
Displacement—L (cu in) 51.8 (3158)
Compression Ratio 13.5:1

CATERPILLAR ENGINE FACILITIES ISO 9001 CERTIFIED

FEATURES

■ **CAT DIESEL GENERATOR SETS**
Factory designed, certified prototype tested, with torsional analysis. Production tested and delivered to you in a package that is ready to be connected to your fuel and power lines. EPG Designer computer sizing available. Supported 100% by your Caterpillar dealer with warranty on parts and labor. Extended warranty available in some areas. The generator set was designed and manufactured in an ISO 9001 compliant facility. Generator set and components meet or exceed the following specifications: AS1359, AS2789, ABGSM TM3, BS4999, DIN6271, DIN6280, EGSA 101P, JEM1359, IEC 34/1, ISO3046/1, ISO DIS8528, NEMA MG1-22.

■ **RELIABLE, FUEL EFFICIENT DIESEL**
The compact, four-stroke cycle diesel engine combines durability with minimum weight while providing dependability and economy. The fuel system operates on a variety of fuels.

■ **CATERPILLAR® SR4 GENERATOR**
Single-bearing, wye connected, static regulated, brushless permanent magnet excited generator designed to match the performance and output characteristics of the Caterpillar diesel engine that drives it.

■ **EXCLUSIVE CATERPILLAR VOLTAGE REGULATOR**
Three phase sensing and Volts per Hertz regulation give precise control, excellent block loading, and constant voltage in the normal operating range.

CATERPILLAR® SR4 GENERATOR

Type ..... Brushless, revolving field, solid-state exciter
Construction ..... Single bearing, close coupled
Three phase ..... Wye connected
Insulation ..... Class F with tropicalization and antiabrasion
Enclosure ..... Drip proof IP 22
Overspeed capability 150%
Paralleling capability ..... standard with adjustable voltage droop
Wave form ..... Less than 5% deviation
Voltage regulator ..... 3-phase sensing with Volts-per-Hertz
Voltage regulation ..... Less than ± 1/2%
Voltage gain ..... Adjustable to compensate for engine speed droop and line loss
TIF ..... Less than 50
THF ..... Less than 3%

CATERPILLAR CONTROL PANEL

24 Volt DC Control
Vibration isolated
NEMA 1, IP 22 enclosure
Dead front
Lockable hinged door
Generator instruments meet ANSI C-39-1

Voltages Available
60 Hz
139/240, 277/480,
346/600, 4160

(Adjustable a minimum of ±10%)
Other voltages available – consult your Caterpillar dealer.
Some voltages require derating

CATERPILLAR®

3512 GENERATOR SET

STANDARD EQUIPMENT

Engine
Aftercooler
Air cleaner
Breather, crankcase
Cooler, lubricating oil
Exhaust fitting and flange
Filters, right hand
fuel, full flow
lubricating oil, full flow
Flywheel housing
Governor
2301A, speed control
Lifting eyes
Manifold, exhaust, dry
Pumps,
fuel transfer, gear driven
lubricating oil, gear driven
jacket water, gear driven
Rails, mounting
Shutoff, manual
Starting, electric, 24 Volt DC
Turbochargers
Vibration damper

Generator
SR4 brushless with VR3 voltage regulator

ELECTRONIC MODULAR CONTROL PANEL (EMCP)

Standard Generator Controls and Monitoring:
Ammeter/voltmeter phase selector switch
Digital ammeter, voltmeter, frequency meter
Selector switch
Voltage adjust rheostat

Standard Engine Controls and Monitoring:
Automatic/manual start-stop control
Cooldown timer
Cycle cranking
DC voltmeter
Engine control switch for: off/reset, auto start, manual start, stop
Emergency stop pushbutton

Shutoffs with LED indicators for:
High coolant temperature
Low oil pressure
Overcrank
Overspeed

OPTIONAL EQUIPMENT

Engine
Air cleaner, heavy duty
Charging alternator
Cooling systems
Exhaust fittings
Governor, Woodward 3161, 2301A load share
Protection devices
Tachometer drive

Generator
Extension terminal box
Manual voltage control
MIL Std 461B
Permanent magnet excitation
RFI N level (VDE 875), BS800
Space heater
Temperature rise detectors

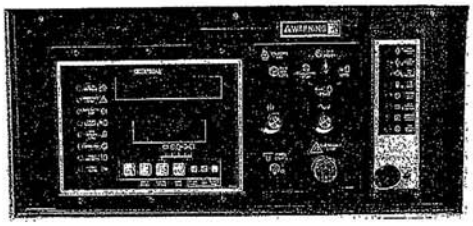
Switchgear
Automatic start/stop
Battery charger
Circuit breaker
Electric operated
Enclosure, floor standing NEMA 1
Main load buss
Manual
Paralleling
manual, permissive
Protective relays

Control Panel
Annunciator panel and prealarm module (meets NFPA 99/110 requirements)
Contacts for remote alarms
Enclosure, NEMA 12/IP 23
Illumination lights and switch
NFPA 110
Provision for:
auxiliary relay
charging voltmeter
cycle cranking
governor speed switcl
manual start/stop module
prealarm module
starting aid switch
synchronizing lights

Caterpillar® EMCP II

Electronic Modular Control Panel

The Electronic Modular Control Panel (EMCP) is a generator-mounted control panel, available on all Caterpillar packaged generator sets. It utilizes environmentally sealed, solid-state, microprocessor-based modules for engine control and AC metering. This new application of mature, high-tech electronics to generator monitoring provides more features, accuracy and reliability than present electro-mechanical and many competitive panel systems.



The EMCP provides these standard control and monitoring features, many of which are options on other panels:

- Automatic/manual start-stop engine control with programmable safety shutdowns and associated flashing LED indicators for low oil pressure, high coolant temperature, overspeed, overcrank and emergency stop
- Cycle cranking–adjustable 1-60 second crank/res periods
- Cooldown timer–adjustable 0-30 minutes
- Energized to run or shutdown fuel control system
- LCD digital readout for: Engine oil pressure; coolant temperature; engine rpm; system DC volt engine running hours; system diagnostic codes; generator AC volts; generator AC amps; and generator frequency
- Engine control switch
- Ammeter-voltmeter phase selector switch
- Emergency stop pushbutton
- Indicator/display test switch
- Voltage adjust potentiometer
- Rugged NEMA 1/IP 22 cabinet.

ON Semiconductor®

3512 GENERATOR SET

CATERPILLAR®

TECHNICAL DATA

3512 Standby Generator Sets			60 Hz–1800 RPM		
Rating Information	Power Rating @ 0.8 PF with Fan	kW	1000	1100	1250
		kV•A	1250	1375	1562
	Engine Bhp without Fan		1482	1592	1818
Physical Factors	Length	mm	5123	5148	5326
		in	201.7	202.6	209.7
	Width	mm	2092	2092	2092
		in	82.4	82.4	82.4
	Height	mm	2459	2459	2459
		in	96.8	96.8	96.8
	Weight	kg	10,215	10,700	10,815
		lb	22,520	23,600	23,850
	Generator Frame Size		685	687	689
Lubrication & Cooling Systems	Engine Lubricating Oil Capacity	L	333	333	333
		qts	352	352	352
	Engine Coolant Capacity with Radiator	L	335	335	335
		gal	88	88	88
	Standard Radiator Arrangement Data: Air Flow (Max @ Rated Speed)	m³/min	1594	1594	2012
		cfm	56,284	56,284	71,044
	Air Flow Restriction (after radiator)	kPa	0.12	0.12	0.12
		in water	0.5	0.5	0.5
	Ambient Air Capability (TMI)	Deg. C	55	50	49
		Deg. F	131	123	118
	Radiator Size		72/25	72/25	72/25
Exhaust System	System Backpressure (Max Allowable)	kPa	6.7	6.7	6.7
		in water	27	27	27
	Exhaust Flange Size (Internal Diameter)	mm	203	203	203
		in	8.0	8.0	8.0
Performance Data @ Rated Conditions	Fuel Consumption (100% load) with Fan per ISO3046/1: +5%, -0% tolerence	L/Hr	267.7	280.4	333.6
		gph	70.7	74.1	88.2
	Fuel Consumption (75% load) with Fan	L/Hr	204.6	219.7	248.2
		gph	54.0	58.0	65.6
	Fuel Consumption (50% load) with Fan	L/Hr	146.1	155.6	174.5
		gph	38.6	41.1	46.1
	Combustion Air Inlet Flow Rate	m³/min	97.3	101	106
		cfm	3436	3580	3732
	Exhaust Gas Flow Rate	m³/min	245	258	293
		cfm	8651	9096	10,335
	Heat Rejection to Coolant (total)	kW	660	689	824
		BTU/min	37,534	39,183	46,861
	Heat Rejection to Exhaust (total)	kW	1087	1138	1380
		BTU/min	61,818	64,718	78,480
	Heat Rejection to Atmosphere from Engine	kW	117	119	126
		BTU/min	6654	6768	7166
	Heat Rejection to Atmosphere from Generator	kW	62.7	62.8	67.2
		BTU/min	3565	3575	3825
	Exhaust Gas Stack Temperature	Deg. C	477	483	548
		Deg. F	891	902	1018
	Deration for Engine Altitude–3% per 305m (1000 ft) above	mm	2075	1650	875
		ft	6808	5413	2871

GEN SET PERFORMANCE DATA [24Z06050]

SEPTEMBER 14, 2011

For Help Desk Phone Numbers Click here

Performance Number: TM3401

Change Level: 10

Sales Model: 3512 DITA
Combustion: DI
Aspr: TA
Engine Power:
1252 W/O F EKW
1,818 HP
Speed: 1,800 RPM
After Cooler: JWAC
Manifold Type: DRY
Governor Type: WDWRD
After Cooler Temp(F): 180
Turbo Quantity:
Engine App: GS
Turbo Arrangement:
Hertz: 60
Application Type: GEN SET-DIE
Engine Rating: GS
Strategy:
Rating Type: STANDBY
Certification:

General Performance Data

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,252	100	1764	245.7	0.36	89.71	194.36	54.13	3,524.41	1,271.48	1,011.74	10,145.91
1,126.8	90	1583	220.61	0.35	79.89	190.94	47.68	3,238.36	1,207.04	972.32	9,058.22
1,001.6	80	1405	195.66	0.35	70.93	187.88	40.45	2,959.37	1,162.04	942.26	8,101.19
939	75	1316	183.33	0.35	66.65	186.44	36.84	2,814.58	1,142.78	932	7,649.16
876.4	70	1227	171	0.36	62.45	185.18	33.26	2,669.79	1,123.52	923.54	7,207.73
751.2	60	1051	146.35	0.36	54.45	183.02	26.27	2,387.27	1,084.82	910.58	6,367.24
626	50	875	121.98	0.37	46.57	180.86	19.6	2,108.29	1,044.68	898.16	5,572.66
500.8	40	704	98.05	0.39	38.89	177.98	13.5	1,857.55	979.88	874.22	4,813.39
375.6	30	531	73.97	0.41	31.15	174.56	8	1,631.54	886.1	828.32	4,078.85
313	25	443	61.79	0.43	27.26	172.94	5.48	1,529.13	829.94	797.54	3,722.17
250.4	20	356	49.46	0.46	23.35	171.68	3.38	1,437.31	767.66	754.7	3,372.55
125.2	10	179	24.95	0.61	15.53	170.06	0.21	1,278.39	624.2	637.34	2,701.57

Engine Heat Rejection Data

GEN PWR EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,252	100	46,235.2	7,165.6	77,286.2	44,642.9	10,293.5	9,611.0	74,783.9	192,561.4	205,072.8
1,126.8	90	41,060.1	6,881.3	67,618.3	38,330.3	9,156.0	7,450.0	67,163.3	171,462.7	182,609.2
1,001.6	80	36,339.9	6,596.9	59,656.5	33,212.0	8,132.4	5,459.5	59,542.8	152,183.8	162,136.0
939	75	34,178.8	6,483.2	56,130.6	30,994.1	7,620.6	4,492.7	55,789.4	143,027.8	152,354.4
876.4	70	31,960.9	6,369.4	52,718.4	28,946.8	7,165.6	3,639.7	52,035.9	134,042.3	142,800.3
751.2	60	27,752.5	6,085.1	46,121.5	25,193.4	6,255.7	2,104.2	44,529.1	116,867.6	124,488.2
626	50	23,601.0	5,800.7	39,695.2	21,724.3	5,345.8	853.0	37,136.0	99,977.2	106,460.4
500.8	40	19,677.0	5,573.2	33,553.2	18,198.4	4,435.9	-113.7	29,856.7	83,428.1	88,887.6
375.6	30	15,696.1	5,288.9	27,468.2	14,445.0	3,525.9	-796.2	22,520.5	66,822.1	71,201.1
313	25	13,705.6	5,175.2	24,454.1	12,568.2	3,127.8	-1,080.5	18,823.9	58,462.2	62,272.5
250.4	20	11,715.2	5,061.4	21,383.1	10,634.7	2,672.9	-1,251.1	15,070.5	50,102.4	53,400.8
125.2	10	7,734.3	4,777.1	15,298.0	6,540.0	1,763.0	-1,478.6	7,563.7	33,325.8	35,486.8

Performance Data

EXHAUST Sound Data: 4.92 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	115	105	120	116	108	106	107	107	105
1,126.8	90	114	104	119	115	107	105	106	106	104
1,001.6	80	113	103	118	114	106	104	106	105	103
939	75	112	103	117	113	105	104	105	105	103
876.4	70	112	102	117	113	105	103	104	104	102
751.2	60	111	101	116	112	104	102	103	103	101
626	50	109	100	114	110	102	101	102	102	100
500.8	40	108	98	113	109	101	100	101	101	99
375.6	30	107	97	112	108	100	98	100	99	97
313	25	106	96	111	107	99	97	99	99	97
250.4	20	105	95	110	106	98	97	98	98	96
125.2	10	103	93	108	104	96	94	96	95	93

EXHAUST Sound Data: 22.97 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	101	93	109	103	95	93	94	94	91
1,126.8	90	100	92	108	103	94	92	93	93	90
1,001.6	80	99	91	107	102	93	91	92	92	89
939	75	99	90	107	101	92	91	92	91	89
876.4	70	98	90	106	101	92	90	91	91	88
751.2	60	97	89	105	99	91	89	90	90	87
626	50	96	87	104	98	90	88	89	89	86
500.8	40	95	86	103	97	88	87	87	87	85
375.6	30	93	85	101	96	87	85	86	86	83
313	25	93	84	101	95	86	85	85	85	82
250.4	20	92	83	100	94	85	84	84	84	81
125.2	10	89	81	97	92	83	81	82	82	79

Performance Data

EXHAUST Sound Data: 49.21 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	95	86	103	97	88	87	87	87	84
1,126.8	90	94	85	102	96	87	86	86	86	83
1,001.6	80	93	84	101	95	86	85	85	85	83
939	75	92	84	100	94	86	84	85	85	82
876.4	70	92	83	100	94	85	84	84	84	81
751.2	60	91	82	99	93	84	83	83	83	80
626	50	89	81	97	92	83	81	82	82	79
500.8	40	88	80	96	90	82	80	81	81	78
375.6	30	87	78	95	89	80	79	79	79	77
313	25	86	77	94	88	80	78	79	78	76
250.4	20	85	76	93	87	79	77	78	78	75
125.2	10	83	74	91	85	76	75	75	75	73

MECHANICAL Sound Data: 3.28 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	104	91	99	100	98	99	100	98	102
1,126.8	90	104	91	99	100	98	99	100	98	102
1,001.6	80	104	91	99	100	98	99	100	98	102
939	75	104	91	99	100	98	99	100	98	102
876.4	70	104	91	99	100	98	99	100	98	102
751.2	60	104	91	99	100	98	99	100	98	102
626	50	104	91	99	100	98	99	100	98	102
500.8	40	104	91	99	100	98	99	100	98	102
375.6	30	104	91	99	100	98	99	100	98	102
313	25	104	91	99	100	98	99	100	98	102
250.4	20	104	91	99	100	98	99	100	98	102
125.2	10	102	89	97	98	96	97	98	96	100

Performance Data

MECHANICAL Sound Data: 22.97 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
1,252	100	92	80	87	88	86	87	88	86	90
1,126.8	90	92	80	87	88	86	87	88	86	90
1,001.6	80	92	80	87	88	86	87	88	86	90
939	75	92	80	87	88	86	87	88	86	90
876.4	70	92	80	87	88	86	87	88	86	90
751.2	60	92	80	87	88	86	87	88	86	90
626	50	92	80	87	88	86	87	88	86	90
500.8	40	92	80	87	88	86	87	88	86	90
375.6	30	92	80	87	88	86	87	88	86	90
313	25	92	80	87	88	86	87	88	86	90
250.4	20	92	80	87	88	86	87	88	86	90
125.2	10	90	78	85	86	84	85	86	84	88

MECHANICAL Sound Data: 49.21 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,252	100	87	74	81	82	80	81	83	80	84
1,126.8	90	87	74	81	82	80	81	83	80	84
1,001.6	80	87	74	81	82	80	81	83	80	84
939	75	87	74	81	82	80	81	83	80	84
876.4	70	87	74	81	82	80	81	83	80	84
751.2	60	87	74	81	82	80	81	83	80	84
626	50	87	74	81	82	80	81	83	80	84
500.8	40	87	74	81	82	80	81	83	80	84
375.6	30	87	74	81	82	80	81	83	80	84
313	25	87	74	81	82	80	81	83	80	84
250.4	20	87	74	81	82	80	81	83	80	84
125.2	10	85	72	79	80	78	79	81	78	82

EMISSIONS DATA

Certification:

To properly apply this data you must refer to performance parameter DM1176 for additional information...

REFERENCE EXHAUST STACK DIAMETER	10 IN
WET EXHAUST MASS	16,179.7 LB/HR
WET EXHAUST FLOW (1,011.20 F STACK TEMP)	10,152.98 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,342.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,061.43 STD CFM
FUEL FLOW RATE	89 GAL/HR

Performance Data

RATED SPEED "Not to exceed data"

EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,252	100	1764	39.4400	10.8400	.5900	1.6000	9.4000	4.2000	1.4300
939	75	1583	34.9400	5.9000	1.0300	.8200	10.3000	2.9000	1.2600
626	50	1405	26.5400	4.0700	1.1000	.7200	11.5000	4.6000	1.4000
313	25	1316	13.1400	2.6300	.9300	.5300	11.7000	2.5000	1.2500
125.2	10	1227	4.8500	1.7500	.7800	.3000	10.5000	999,999.8750	.8500

RATED SPEED "Nominal Data"

EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,252	100	1764	32.8700	6.0200	.4400	1,928.4	1.1400	9.4000	4.2000	1.4300
939	75	1316	29.1200	3.2800	.7800	1,398.3	.5900	10.3000	2.9000	1.2600
626	50	875	22.1200	2.2600	.8300	1,027.8	.5100	11.5000	4.6000	1.4000
313	25	443	10.9500	1.4600	.7000	557.6	.3800	11.7000	2.5000	1.2500
125.2	10	179	4.0400	.9700	.5900	265	.2200	10.5000	999,999.8750	.8500

Performance Data

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp
984.25 F	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp
1,640.42 F	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,800.99 hp	1,758.08 hp	1,800.99 hp
3,280.84 F	1,800.99 hp	1,800.99 hp	1,764.78 hp	1,708.46 hp	1,654.82 hp	1,800.99 hp
4,921.26 F	1,776.85 hp	1,716.51 hp	1,660.18 hp	1,606.54 hp	1,556.92 hp	1,712.48 hp
6,561.68 F	1,670.91 hp	1,613.25 hp	1,560.95 hp	1,511.33 hp	1,464.39 hp	1,628 hp
8,202.1 F	1,570.33 hp	1,516.69 hp	1,465.73 hp	1,418.8 hp	1,375.89 hp	1,547.54 hp
9,842.52 F	1,473.78 hp	1,424.16 hp	1,377.23 hp	1,332.97 hp	1,291.4 hp	1,468.42 hp
10,498.69 F	1,436.23 hp	1,387.96 hp	1,342.36 hp	1,299.45 hp	1,259.22 hp	1,438.91 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	7C5185	**Lube Oil Press @ Rated Spd(PSI):**	55.8
Effective Serial No:	24Z07877	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,244.1
Primary Engine Test Spec:	0T6106	**Max Operating Altitude(FT):**	3,274.3
Performance Parm Ref:	TM5738	**PEEC Elect Control Module Ref**	
Performance Data Ref:	TM3401	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:	TD3097	**Turbocharger Model**	TV9211-2.00VTF
Certification Ref:		**Fuel Injector**	1111775
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	13.0	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	180	**Unit Injector Timing (MM):**	86.9
Crankcase Blowby Rate(CFH):	907.6	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	8.1	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	**Peak Torque (LB/FT):**	--

Reference Number: TM3401

NOTE: ALSO USES ENGINE ARRANGEMENT 2W8405

Parameters Reference: TM5738

GEN SET - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER +/- 3%
EXHAUST STACK TEMPERATURE +/- 8%
GENERATOR POWER +/- 5%
INLET AIR FLOW +/- 5%
INTAKE MANIFOLD PRESSURE - GAGE +/- 10%
EXHAUST FLOW +/- 6%
SPECIFIC FUEL CONSUMPTION +/- 3%
FUEL RATE +/- 5%
HEAT REJECTION +/- 5%
HEAT REJECTION EXHAUST ONLY +/- 10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS
EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

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GOEMGEN

3516
Industrial Engine

1492 bkW/2000 bhp @ 1800 rpm

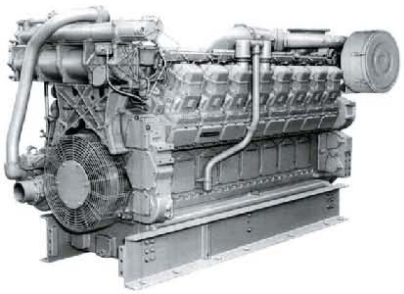

Image shown may not reflect actual engine

CAT® ENGINE SPECIFICATIONS

V-16, 4-Stroke-Cycle Diesel

Bore.....170.0 mm (6.69 in)
Stroke.....190.0 mm (7.48 in)
Displacement..... 69.06 L (4,214.3 in³)
Aspiration.....Turbocharged / Aftercooled
Compression Ratio.....13.0:1
Rotation (from flywheel end)..... Counterclockwise
Capacity for Liquids
Cooling System..... 233.0 L (61.6 gal)
Lube Oil System (refill)..... 401.3 L (106.0 gal)
Engine Weight, Net Dry (approximate)7,484 kg (16,499 lb)

FEATURES

EMISSIONS

Non-certified rating.

SINGLE SOURCE SUPPLIER

Caterpillar:
- Casts engine blocks, heads, cylinder liners, and flywheel housings
- Machines critical components
- Assembles complete engine

Ownership of these manufacturing processes enables Caterpillar to produce high quality, dependable product.

Factory-designed systems built at Caterpillar ISO 9001:2000 certified facilities

TESTING

Prototype testing on every model:
- proves computer design
- verifies system torsional stability
- functionality tests every model

Every Caterpillar engine is dynamometer tested under full load to ensure proper engine performance

FULL RANGE OF ATTACHMENTS

Wide range of bolt-on system expansion attachments, factory designed and tested

UNMATCHED PRODUCT SUPPORT OFFERED THROUGH WORLDWIDE CATERPILLAR DEALER NETWORK

More than 1,500 dealer outlets.
Caterpillar factory-trained dealer technicians service every aspect of your industrial engine.
99.7% of parts orders filled within 24 hours worldwide.
Caterpillar parts and labor warranty.
Preventive maintenance agreements available for repair before failure options.
Scheduled Oil Sampling program matches your oil sample against Caterpillar set standards to determine:
- internal engine component condition
- presence of unwanted fluids
- presence of combustion by-products

WEB SITE

For all your industrial power requirements, visit www.cat-industrial.com.

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3516
Industrial Engine

STANDARD ENGINE EQUIPMENT

1492 bkW/2000 bhp @ 1800 rpm

Air Inlet System

Aftercooler core, corrosion resistant coated (air side)
Air cleaner, regular duty with service indicators
Turbochargers, rear mounted

Control System

Governor, RH, 3161 with self contained synthetic oil sump.
Air-fuel ratio control, mechanical speed control, without torque control.
Governor control, positive locking

Cooling System

Thermostats and housing for conventional core radiator
Jacket water pump, gear driven, centrifugal

Exhaust System

Exhaust manifold, dry

Flywheels and Flywheel Housings

Flywheel , SAE No. 00, 183 teeth
Flywheel housing, SAE No. 00

Fuel System

Fuel filter, with service indicators, cartridge type with RH service
Fuel transfer pump

Instrumentation

Instrument Panel, RH
- Engine oil pressure gauge
- Fuel pressure gauge
- Oil filter differential gauge
- Jacket water temperature gauge
- Service meter, electric
- Tachometer

Lube System

Crankcase breather, top mounted
Oil cooler
Oil filler and dipstick, RH
Oil pump
Oil filter, cartridge type with RH service
Shallow oil pan

Mounting System

Rails, mounting, engine length, 254 mm (10 in), industrial-type, C-channel.

Power Take-Offs

Accessory drive, upper RH
Front housing, single sided

Protection System

Junction box
Manual shutoff, RH
Safety shutoff protection, energized to shutdown
Low oil pressure, low idle 69 kPa (10 psi); high idle 207 kPa (30 psi)
Water temperature
Overspeed
3161 governor solenoid energized to shutdown

Starting System

Starting switch

General

Paint, Caterpillar Yellow,
Vibration damper and guard,
Lifting eyes

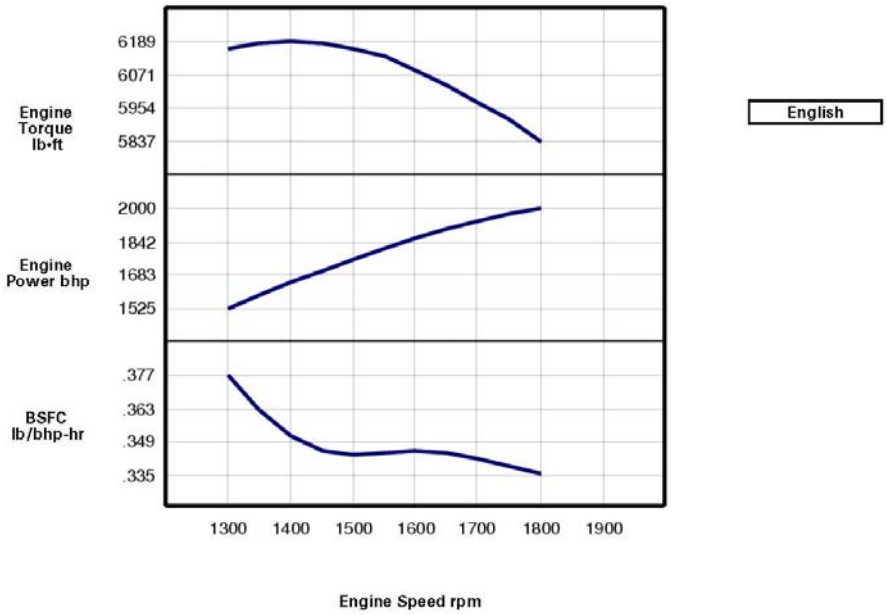
CAT

3516
Industrial Engine

PERFORMANCE CURVES

1492 bkW/2000 bhp @ 1800 rpm

IND - C (Intermittent) - TM3382-08



Engine Speed rpm	Engine Power bhp	Engine Torque lb•ft	BSFC lb/bhp-hr	Fuel Rate gal/hr
1800	2000	5837	.335	95.8
1750	1970	5913	.339	95.3
1700	1935	5979	.342	94.5
1650	1897	6039	.344	93.3
1600	1856	6092	.345	91.5
1550	1810	6133	.344	88.9
1500	1760	6165	.343	86.3
1450	1707	6181	.345	84.1
1400	1650	6189	.351	82.8
1350	1589	6181	.363	82.2
1300	1525	6161	.377	82.2

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CAT

3516
Industrial Engine

RATINGS AND CONDITIONS

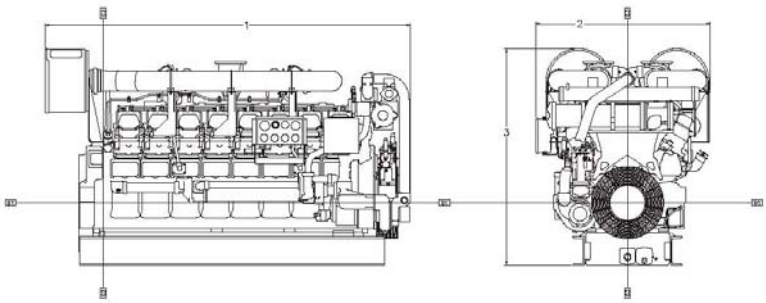
1492 bkW/2000 bhp @ 1800 rpm

IND - C (Intermittent) Intermittent service where maximum power and/or speed are cyclic. The power and speed capability of the engine can be utilized for one uninterrupted hour followed by one hour of operation at or below IND - A. Time at full load is not to exceed 50% of the duty cycle. Typical service examples are: agricultural tractors, harvesters and combines, off highway trucks, fire pump application power, blast hole drills, rock crushers and wood chippers with high torque rise, and oil field hosting.

Engine Performance Engine performance is corrected to inlet air standard conditions of 99 KPA (29.31 IN HG) dry barometer and 25 deg C (77 deg F) temperature. These values correspond to the standard atmospheric pressure and temperature as shown in SAE J1995.

Performance measured using a standard fuel with fuel gravity of 35 degrees API having a lower heating value of 42,780 KJ/KG (18,390 BTU/LB) when used at 29 DEG (84.2 DEG F) where the density is 838.9 G/L (7.001 LB/US GAL).

The corrected performance values shown for Caterpillar engines will approximate the values obtained when the observed performance data is corrected to SAE J1995, ISO 3046-2 and 8665 and 2288 and 9249 and 1585, EEC 80/1269 and DIN 70020 standard reference conditions.



Engine Dimensions	
(1) Length	132.51 in
(2) Width	67.05 in
(3) Height	67.7 in

Note: Do not use for installation design. See general dimension drawings for detail (Drawing # 1729243).

Performance Number: TM3382-08

Feature Code: 516DI01 Arr. Number: 4W0284

Materials and specifications are subject to change without notice.

16304903

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Certify Rerate

Page 1 of 1

EMISSIONS CERT. [1HZ00791] **DECEMBER 07, 2004**

(1HZ00791)-ENGINE (4FN01962)-GENERATOR (BPD00452)-GENSET

Emissions Certification

Serial Number	1HZ00791
Arrgmt Number	1889442
Spec Number	0K2944
Certification - 1	NONROAD - EUROPEAN UNION EXEMPT
Certification - 2	Nonroad - EPA, CARB, Cert
Has Engine Been Rerated?	No
Interlock Code Actual Progression	No Interlock Code Progression
As - Shipped Interlock Code	No Interlock Code
As - Shipped Flash File	1808677
As - Shipped Flash File CRB	1808678
As - Shipped CORR FL Power	2,934 HP (2,188.0 KW)
Build Date	2001-05-01

CATERPILLAR GOEMGEN

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GEN SET PACKAGE PERFORMANCE DATA [1HZ00791] DECEMBER 07, 2004

(1HZ00791)-ENGINE (4FN01962)-GENERATOR (BPD00452)-GENSET

Performance Number: DM4683 **Change Level:** 00

Sales Model: 3516BDITA **Combustion:** DI **Aspr:** TA

Engine Power:
1825 W/F EKW 1880 W/O F EKW
2,628 HP

Speed: 1,800 RPM **After Cooler:** SCAC

Manifold Type: DRY **Governor Type:** ADEM **After Cooler Temp(F):** 140
Turbo Quantity: 4 **Engine App:** GP **Turbo Arrangement:** Parallel
Hertz: 60 **Engine Rating:** PGS **Strategy:**
Rating Type: PRIME **Certification:** EPA TIER-I 2000 - 2005

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL RATE LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,825.0	100	2,593.0	271	0.332	123.1	176.0	73.7	5,812.8	1,107.1	807.8	14,256.5
1,642.5	90	2,337.9	244	0.334	111.6	171.0	67.0	5,487.9	1,063.4	782.2	13,172.4
1,460.0	80	2,084.2	218	0.339	100.8	167.5	60.5	5,155.9	1,028.7	763.5	12,187.1
1,368.8	75	1,957.8	205	0.341	95.4	165.7	57.1	4,972.3	1,011.7	757.0	11,682.1
1,277.5	70	1,831.2	191	0.343	89.8	163.6	52.8	4,735.7	995.0	753.6	11,117.1
1,095.0	60	1,579.1	165	0.349	78.6	159.4	44.2	4,259.0	961.5	747.0	9,955.2
912.5	50	1,327.6	139	0.355	67.3	155.3	35.6	3,782.2	928.2	740.3	8,740.4
730.0	40	1,080.3	113	0.363	56.0	151.7	27.3	3,309.0	879.3	721.9	7,497.3
547.5	30	830.0	87	0.376	44.6	148.8	19.2	2,828.7	813.4	689.7	6,240.1
456.3	25	703.6	74	0.386	38.8	147.4	15.1	2,588.6	773.8	668.3	5,604.4
365.0	20	576.4	60	0.401	33.0	146.5	11.8	2,362.6	721.4	633.0	4,968.8
182.5	10	319.6	33	0.467	21.3	145.4	6.4	1,938.8	588.9	535.1	3,690.4

Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,825.0	100	40,605	7,677	98,442	49,534	13,194	25,193	109,986	264,672	281,904
1,642.5	90	37,762	7,336	89,399	43,960	12,000	21,838	99,124	239,820	255,460
1,460.0	80	34,975	6,995	80,926	39,354	10,805	18,540	88,376	215,764	229,811
1,368.8	75	33,610	6,881	76,661	37,307	10,237	16,890	83,030	203,765	217,072
1,277.5	70	32,188	6,711	72,452	35,202	9,668	15,298	77,684	191,765	204,277
1,095.0	60	29,231	6,426	63,979	31,108	8,417	12,170	66,936	167,823	178,742
912.5	50	26,160	6,085	55,505	27,070	7,222	9,213	56,301	143,881	153,264
730.0	40	22,919	5,801	46,975	22,464	6,028	6,483	45,837	120,109	127,957
547.5	30	19,393	5,460	38,103	17,459	4,777	4,038	35,202	95,883	102,195
456.3	25	17,516	5,289	33,553	14,900	4,152	2,900	29,857	83,599	89,058
365.0	20	15,582	5,118	28,833	12,000	3,526	1,820	24,454	71,144	75,808
182.5	10	11,488	4,663	18,995	6,313	2,275	-57	13,535	45,723	48,737

EMISSIONS DATA

EPA TIER-I 2000 - 2005 ********** A4
Gaseous emissions data measurements are consistent with those described in EPA 40 CFR PART 89 SUBPART D and ISO 8178 for measuring HC, CO, PM, and NOx.

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kW-hr			
U.S. (incl Calif)	EPA/Tier-1	CO:11.4	HC:1.3	NOx:9.2	PM:0.54

EXHAUST STACK DIAMETER	8 IN
WET EXHAUST MASS	26,433.39 LB/HR
WET EXHAUST FLOW (983 DEG F STACK TEMP)	14,267.14 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	5,559.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	5,092.38 STD CFM
FUEL FLOW RATE	123 GAL/HR

RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,825.0	100	2,593.0	52.69	0.97	0.97	.480	11.00	1.4	1.28
1,368.8	75	1,957.8	29.36	1.09	0.96	.490	12.00	1.7	1.28
912.5	50	1,327.6	17.66	1.37	0.76	.430	12.70	2.5	1.28
456.3	25	703.6	9.48	1.44	0.53	.300	14.00	2.1	1.28
182.5	10	319.6	6.73	2.05	0.52	.180	15.90	1.5	1.28

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,825.0	100	2,593.0	43.90	0.54	0.73	2,571.0	0.340	11.00	1.4	1.28
1,368.8	75	1,957.8	24.47	0.60	0.73	1,984.3	0.350	12.00	1.7	1.28
912.5	50	1,327.6	14.72	0.76	0.57	1,392.4	0.310	12.70	2.5	1.28
456.3	25	703.6	7.90	0.80	0.40	803.3	0.210	14.00	2.1	1.28
182.5	10	319.6	5.61	1.14	0.39	428.4	0.130	15.90	1.5	1.28

Altitude Capability Data

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp
984 F	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp
1,640 F	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp	2,628 hp
3,281 F	2,628 hp	2,628 hp	2,628 hp	2,620 hp	2,540 hp	2,628 hp
4,921 F	2,628 hp	2,628 hp	2,547 hp	2,466 hp	2,390 hp	2,628 hp
6,562 F	2,564 hp	2,477 hp	2,395 hp	2,319 hp	2,246 hp	2,498 hp
8,202 F	2,408 hp	2,327 hp	2,250 hp	2,178 hp	2,111 hp	2,374 hp
9,843 F	2,261 hp	2,185 hp	2,112 hp	2,045 hp	1,982 hp	2,254 hp
10,499 F	2,205 hp	2,130 hp	2,060 hp	1,993 hp	1,931 hp	2,207 hp

Identification Reference and Notes

Engine Arrangement:	1979039	Lube Oil Press @ Rated Spd(PSI):	55.8
Effective Serial No:	1HZ00474	Piston Speed @ Rated Eng SPD (FT/Min):	2,173.2
Primary Engine Test Spec:	0K2955	Max Operating Altitude(FT):	4,921.3
Performance Parm Ref:	TM5739	PEEC Elect Control Module Ref	
Performance Data Ref:	DM4683	PEEC Personality Cont Mod Ref	
Aux Coolant Pump Perf Ref:	DM1286		
Cooling System Perf Ref:	DM1299	Turbocharger Model	BTV8501-1.23
Certification Ref:	EPA TIER-I	Fuel Injector	1008774
Certification Year:	2000	Timing-Static (DEG):	--
Compression Ratio:	14.0	Timing-Static Advance (DEG):	--
Combustion System:	DI	Timing-Static (MM):	--
Aftercooler Temperature (F):	140	Unit Injector Timing (MM):	64.3
Crankcase Blowby Rate(CFH):	2,627.4	Torque Rise (percent)	--
Fuel Rate (Rated RPM) No Load (Gal/HR):	14.5	Peak Torque Speed RPM	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	Peak Torque (LB/FT):	--

Performance Data

Reference Number: DM4683 EPA TIER-I 20002005A4

Parameters Reference: TM5739 GEN SET - PACKAGED - DIESEL

TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER	+/-	3%
EXHAUST STACK TEMPERATURE	+/-	8%
GENERATOR POWER	+/-	5%
INLET AIR FLOW	+/-	5%
INTAKE MANIFOLD PRESSURE - GAGE	+/-	10%
EXHAUST FLOW	+/-	6%
SPECIFIC FUEL CONSUMPTION	+/-	3%
FUEL RATE	+/-	5%
HEAT REJECTION	+/-	5%
HEAT REJECTION EXHAUST ONLY	+/-	10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

DEFINITIONS:

DEC-7-2004 12:22 FROM: TO:912082346617

Performance Data

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STANDBY - MAXIMUM OUTPUT AVAILABLE FOR NON PROGRAMMED POWER OUTAGES. THE EXPECTED USAGE SHOULD BE APPROXIMATELY 30 HOURS PER YEAR AND THE AVERAGE DEMAND, DURING THE OUTAGE, SHOULD NOT EXCEED THE CORRESPONDING INDUSTRIAL ENGINE CONTINUOUS RATING. STANDBY RATINGS MAY BE USED IN PEAK SHAVING AND DURING INTERRUPTIBLE UTILITY SERVICE IF THE FOLLOWING CRITERIA ARE MET.

500	HOURS/YEAR OR LESS
60%	MAXIMUM AVERAGE LOAD FACTOR
80%	LOAD PEAK DEMAND
100%	LOAD USED ONLY FOR EMERGENCIES

PRIME POWER - OUTPUT AVAILABLE FOR PEAK DEMAND OF A VARIABLE ELECTRIC LOAD INCLUDING PEAK SHAVING AND PROGRAMMED OUTAGES. THE AVERAGE DEMAND DURING ANY 24 HOUR PERIOD SHOULD NOT EXCEED THE CORRESPONDING INDUSTRIAL ENGINE CONTINUOUS RATING. ALL PRIME POWER RATINGS, EXCEPT D SERIES, HAVE 10% OVERLOAD FOR EMERGENCY USE.

CONTINUOUS - OUTPUT WHICH MAY BE UTILIZED CONTINUOUSLY WITHOUT LOAD CYCLING. ALL 3600 ENGINE CONTINUOUS RATINGS HAVE 10% OVERLOAD CAPABILITY.

CATERPILLAR

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http://tmiweb.cat.com/tmi/servlet/cat.cdis.tmiweb.gui.TMIDirector?Action=buildtab&ref... 12/07/2004

GOEMGEN Air Flow Backup Data

RE: Air Flow Data
Tim Horting [TimHorting@wseco.com]
Sent: Thursday, February 23, 2012 9:52 AM
To: Joy Wilson

All they are going to give us is what is stated below from the Cat engineer. "Terry Hamrick"

Thank you
Tim Horting
Engine Sales
208-947-4545 Phone
208-947-4599 Fax
208-866-5469 Cell
timhorting@wseco.com
plan for tomorrow but live for today

From: Joy Wilson [mailto:jwilson@stoller.com]
Sent: Thursday, February 23, 2012 7:51 AM
To: Tim Horting
Subject: RE: Air Flow Data
Importance: High

Tim,

Any luck on getting a cut sheet or any paperwork that shows that the air flow is 68000 cfm for the 3516B?

Thanks,

Joy

From: Tim Horting [TimHorting@wseco.com]
Sent: Wednesday, January 25, 2012 9:54 AM
To: Joy Wilson
Subject: Fw: Air Flow Data

Joy
Here is the e mail from cat on your air flow

Sent from my Verizon Wireless 4G LTE Phone

-----Original message-----
From: Tiffany Martinez <TiffanyMartinez@wseco.com>
To: Tim Horting <TimHorting@wseco.com>
Sent: Wed, Jan 25, 2012 09:31:02 EST
Subject: Air Flow Data

*** Terry Hamrick : WE 01/25/2012 07:26 CST ***
Tiffany,

Per Rental engineering the airflow for the 3516B is 68,000 cfm with the standard package restriction.

Best regards,
Terry Hamrick
A<(>&<)>I

*** Terry Hamrick : WE 01/25/2012 07:25 CST ***
*** Michael Snellenbarger : WE 01/25/2012 06:38 CST ******** TIffanyMartinez: TU 01/24/2012 15:03 CST *****
We need to get the Fan Air Flow Data for serial number
BPD00452

Thank you.

Tiffany Martinez
Inside Generator Sales
Western States Equipment Co.
ph. 208.947.4539
fax 208.947.4599
www.westernstatescat.com

Appendix C

Good Engineering Practice Stack Analysis

GEP Table

Stack ID	Source Type	Location	Building Contributing to GEP	Building Height (m)	Building Base Elevation (m)	Actual Stack Height (m)	Stack Base Elevation (m)	Stack-Bld Elevation Difference (m)	GEP (Eqn 1) (m)
ABOI	Boiler	Building A	B	3.66	1443	4.8	1439.56	-5.44	22.21
BBOIHWB	Boiler	Building B	E	6.71	1445	11.3	1444.81	-5.19	21.96
BBOIST1	Boiler	Building B	E	6.71	1445	13.0	1444.6	-5.4	22.18
CBOIHWB	Boiler	Building C	H	6.71	1444	13.7	1442.66	0.66	49.64
DBOIHWB1	Boiler	Building D	H	6.71	1441	13.7	1440.28	-1.72	52.02
DBOIST1	Boiler	Building D	H	6.71	1441	14.0	1440.4	-1.6	51.9
GBOIHWE	Boiler	Building G	H	4.57	1449	8.5	1446.8	4.8	45.5
GBOISB1	Boiler	Building G	H	4.57	1449	9.6	1447.29	5.29	45.01
GBOISB2	Boiler	Building G	H	4.57	1449	9.6	1447.66	5.66	44.64
GBOISB3	Boiler	Building G	H	4.57	1449	9.6	1447.93	5.93	44.37
BCT1	Cooling Tower	Building B	E	6.71	1445	4.3	1445.65	-4.35	21.12
BCT2	Cooling Tower	Building B	E	6.71	1445	4.7	1446.24	-3.76	20.54
CCT1	Cooling Tower	Building C	H	6.71	1444	5.0	1445.73	3.73	46.57
CCT2	Cooling Tower	Building C	H	6.71	1444	5.0	1446.82	4.82	45.48
DCT1	Cooling Tower	Building D	H	6.71	1441	5.6	1441.3	-0.7	51
DCT2	Cooling Tower	Building D	H	6.71	1441	5.6	1442.69	0.69	49.61
GCT1	Cooling Tower	Building G	H	4.57	1449	7.9	1449.4	7.4	42.9
GCT2	Cooling Tower	Building G	H	4.57	1449	7.9	1448.78	6.78	43.52
BEMGEN	Emergency Generator	Building B	E	6.71	1445	10.4	1445.07	-4.93	21.71
CEMGENR	Emergency Generator	Building C	H	6.71	1444	10.7	1444.26	2.26	48.04

Stack ID	Source Type	Location	Building Contributing to GEP	Building Height (m)	Building Base Elevation (m)	Actual Stack Height (m)	Stack Base Elevation (m)	Stack-Bld Elevation Difference (m)	GEP (Eqn 1) (m)
CEMGENS	Emergency Generator	Building C	H	6.71	1444	10.7	1443.08	1.08	49.22
DEMGEN	Emergency Generator	Building D	H	6.71	1439.5	12.2	1,439.51	-2.49	52.79
DMREMGEN	Emergency Generator	Building D	H	6.71	1441	15.9	1432.82	-9.18	59.48
GEEMGEN	Emergency Generator	Building G	H	4.57	1449	5.1	1446.56	4.56	45.74
GOEMGEN	Emergency Generator	Building G	H	4.57	1449	4.3	1447.15	5.15	45.15
CEXHF1	Exhaust Fan	Building C	H	6.71	1444	11.0	1441.19	-0.81	51.11
CEXHF5	Exhaust Fan	Building C	H	6.71	1444	11.0	1441.15	-0.85	51.15
DEXHF8	Exhaust Fan	Building D	H	6.71	1441	10.4	1438.82	-3.18	53.48
DEXHF15	Exhaust Fan	Building D	H	6.71	1441	8.1	1437.87	-4.13	54.43
DEXHF16	Exhaust Fan	Building D	H	6.71	1441	7.6	1435.4	-6.6	56.9
HPEXHF15[a]	Exhaust Fan	Building H	H	23.16	1442	23.7	1444.29	2.29	48.01
HPEXHF16[a]	Exhaust Fan	Building H	H	23.16	1442	23.7	1444.57	2.57	47.73
HSEXF5[a]	Exhaust Fan	Building H	H	23.16	1442	24.4	1443.8	1.8	48.5
HSEXHF4[a]	Exhaust Fan	Building H	H	23.16	1442	24.4	1443.26	1.26	49.04
HSEXHF17[a]	Exhaust Fan	Building H	H	23.16	1442	23.2	1444.35	2.35	47.95
HSEXHF18[a]	Exhaust Fan	Building H	H	23.16	1442	23.2	1444.48	2.48	47.82
DSCRUBF1	Scrubber Fan	Building D	H	6.71	1441	13.1	1442	0	50.3
DSCRUBF2	Scrubber Fan	Building D	H	6.71	1441	13.1	1441.88	-0.12	50.42
DSCRUBF3	Scrubber Fan	Building D	H	6.71	1441	13.1	1442	0	50.3
DSCRUB5	Wet Scrubber	Building D	H	6.71	1441	16.8	1433.48	-8.52	58.82
DSCRUB10	Wet Scrubber	Building D	H	6.71	1441	14.9	1436.39	-5.61	55.91

Stack ID	Source Type	Location	Building Contributing to GEP	Building Height (m)	Building Base Elevation (m)	Actual Stack Height (m)	Stack Base Elevation (m)	Stack-Bld Elevation Difference (m)	GEP (Eqn 1) (m)
DSCRUB14	Wet Scrubber	Building D	H	6.71	1441	15.2	1436.02	-5.98	56.28
FSCRUB1	Wet Scrubber	Building F	H	3.66	1448	8.4	1444.86	2.86	47.44
HSCRUB1	Wet Scrubber	Building H	H	23.16	1442	24.6	1444.41	2.41	47.89
HSCRUB2	Wet Scrubber	Building H	H	23.16	1442	24.6	1444.36	2.36	47.94
HSCRUB3	Wet Scrubber	Building H	H	23.16	1442	24.6	1444.54	2.54	47.76
HSCRUB4	Wet Scrubber	Building H	H	23.16	1442	24.6	1444.33	2.33	47.97
HSCRUB7F1[b]	Wet Scrubber	Building H	H	29.87	1442	19.4	1438.47	-3.53	53.83
HSCRUB7F2[b]	Wet Scrubber	Building H	H	29.87	1442	19.4	1438.19	-3.81	54.11
LS	Lime Silo	Building F	H	3.66	1448	11.3	1444.47	2.47	47.83

Appendix D

Boilers and Emergency Generators

TABLE OF CONTENTS

Boiler Information E-1
Emergency Generators.....E-2

Boiler Information

Location	Emission Unit ID	Manufacturer Model Number	Install Year	Rated Output[3] HP	Rated Output[3] MMBtu per Hr	On-line Rating (hrs/yr) Actual	On-line Rating (hrs/yr) Used for PTE	Fuel	Fuel Rate SCFH or GPH	Remarks
Building A	ABOI	Teledyne Laars PH0850 IN0 9K01	1987	20.6	0.69	4,380	8,760	Natural Gas @ 1020 BTU/CF	833	Hot water boiler, winter service only. 81% efficiency per manufacturer. AP-42 class: small boiler, uncontrolled.
Building B	BBOIHWB	Sellers 15 Senior S-200-W	1990	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building B	BBOIST	Sellers 15 Senior 175 HP	1995	175	5.86	8,760	8,760	Natural Gas @ 1020 BTU/CF	7,179	Steam boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building C	CBOIHWB	Sellers 15 Senior S-200-W	1982	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building D	DBOIHWB	Sellers 15 Senior S-200-W	1982	200	6.70	8,760	8,760	Natural Gas @ 1020 BTU/CF	8,205	Hot water boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building D	DBOIST1	Sellers 15 Commodore 125	1983	125	4.18	8,760	8,760	Natural Gas @ 1020 BTU/CF	5,128	Steam boiler. 80% efficiency per manufacturer. AP-42 classification: small boiler, uncontrolled.
Building G	GBOIHWE	Lochinvar CWN1436PM	1997	35	1.16	4,380	8,760	Natural Gas @ 1020 BTU/CF	1,407	Hot water boiler, winter service only. 81% efficiency per manufacture. AP-42 class: small boiler, uncontrolled.
Building G	GBOISB1	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.
Building G	GBOISB2	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.
Building G	GBOISB3	Sellers 300-SH-LN-390	1997	300	10.04	8,760	8,760	Natural Gas @ 1020 BTU/CF	12,307	OFCI, 30 ppm NOx Burner. 80% efficiency per manufacturer. AP-42 class: small boiler, controlled - low NO_x burners.
Building G	GBOISB4	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	Future potential boiler. Assumed will be sized equivalent to GBOISB1-3 for calculations.
Building G	GBOISB5	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	Future potential boiler. Assumed will be sized equivalent to GBOISB1-3 for calculations.

Boiler HP is equivalent to 33,475 BTU/hr.
TBD = to be determined

Emergency Generators

Location	Emission Unit ID	Manufacturer	Install Year	Gen Rated Output	Engine Rated Output	On-line Rating (hrs/yr)		Fuel	Fuel Rate	Remarks
		Model Number		HP	HP	Actual	Used for PTE		SCFH or GPH	
Building B	BEMGEN	Onan 15.0 RJC 15 kW	1970	20	--	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	255	Supports Building B. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.
Building C	CEMGENR	Onan 15.0 RJC 15 kW	1974	20	--	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	255	Supports Building C. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.
Building C (outside, S side)	CEMGENS	Caterpillar 1250 kW	2001	1676	1818	26	100	Diesel @ 128,750 BTU/gal[a], 0.15% sulfur	48.9	Supports Building D (Fab 9). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. TMI Engine and Compressor Performance Test DM6686-00. Fuel rate are at 50% load. Fuel rate per engine test.
Building D	DEMGEN	Onan 30.OEK-15R/9336M 30 kW	1983	40	82	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	600	Supports Building D. Fuel rate per manufacturer. AP-42 classification: 4-stroke rich-burn engine, 105% load.
Building D Support Room 1138	DMREMGEN	Kohler 60RZ72 60 kW	1996	80	126	26	100	Natural Gas @ 1020 MMBTU/10^6S CF	960	Supports Bldg D (Fab 9) and GH 10. AP-42 classification: 4-stroke, rich-burn engine, 60% load.
Building G (outside, E side)	GEEMGEN	Caterpillar 1250 kW	1998	1676	1818	26	100	Diesel @ 128,750 BTU/gal[a] 0.15% sulfur	46.6	Supports Building H (Fab 10). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. TMI Engine and Compressor Performance Test TM3401. Fuel rate are at 50% load. Fuel rate per engine test.
Building G (outside, S side)	GOEMGEN	Caterpillar 1825 kW	2005	2447	2593	26	100	Diesel @ 128,750 BTU/gal[a] 0.15% sulfur	67.3	Supports Building H (Fab 10). AP-42 classification: large stationary diesel engine. [a]BTU rating used for calculations. Fuel rate per engine test. Cat Gen Set Package Emission Certification. Fuel rate are at 50% load.

Appendix E

Scrubber Unit Specification

Scrubber Unit Specification

Emission Unit ID	Control Equipment Name	Control Equipment ID	Stack ID	Manufacturer	Model No.	Date of Installation	Type	Dimensions in Feet (HtxDiaxL)	Water Flow (gpm)	Pressure Drop (in H2O)	Minimum Removal Efficiency (%)
Fab 9 & Fab 10	Bld D, Scrubber 1	DSCRUB1	DSCRUBF1,2, or 3	Harrington	79-3	1984	wet/spray	9.6 x 7x 9	50	0.5	90%
Fab 9 & Fab 10	Bld D, Scrubber 2	DSCRUB2	DSCRUBF1,2, or 3	Harrington	79-3	1984	wet/spray	9.6 x 7x 9	50	0.5	90%
Fab 9 & Fab 10	Bld D, Scrubber 5	DSCRUB5	DSCRUB5	Harrington	ECH-55-5LB	1997	wet/spray	6 x 5 x 6.7	20	0.85	90%
Fab 9 & Fab 10	Bld D, Scrubber 10	DSCRUB10	DSCRUB10	Harrington	ECH-44-3LB	1990	wet/spray	6.7 x 4.1 x 4.5	10	0.5	90%
Fab 9 & Fab 10	Bld D, Scrubber 14	DSCRUB14	DSCRUB14	Harrington	ECH-33-5LB	1996	wet/spray	5.6 x 3.2 x 5	20	0.35	90%
Bld F	Bld F, Scrubber 1	FSCRUB1	FSCRUB1	Harrington	HPH 34-3	1983	Wet/spray	5.2 x 4 x 9.3	44	1.5	90%
Fab 9 & Fab 10	Bld H, Scrubber 1	HSCRUB1	HSCRUB1	Harrington	ECH-9 11-5LB	1997	wet/spray	11 x 11.2 x 7.5	80	0.4	90%
Fab 9 & Fab 10	Bld H, Scrubber 2	HSCRUB2	HSCRUB2	Harrington	ECH-9 11-5LB	1997	wet/spray	11 x 11.2 x 7.5	80	0.8	90%
Fab 9 & Fab 10	Bld H, Scrubber 3	HSCRUB3	HSCRUB3	Harrington	ECH-9 11-5LB	2004	wet/spray	11 x 11.2 x 7.5	80	0.5	90%
Fab 9 & Fab 10	Bld H, Scrubber 4	HSCRUB4	HSCRUB4	Harrington	ECH-9 11-5LB	2000	wet/spray	11 x 11.2 x 7.5	80	0.7	90%
Fab 9 & Fab 10	Bld H, Scrubber 7	HSCRUB7	HSCRUB7F1 or F2	Tri-mer	F/WR-10-48-2	2011	wet/spray	12.33 x 7.75 x 15.5	140	0.1	90%

Appendix F

Cooling Tower Specifications

Cooling Tower Specifications

Location	Emission Unit ID	Conductivity	Total Dissolved Solids[1]	MAX FLOW	On-line Rating (hrs/yr)	Cooling Water	Remarks
		(µmho/cm)	(ppm)	(GPM)	Used for PTE	(GPH)	
Building B	BCT1	2,900	1,856	1,870	8,760	112,200	Vertical discharge, Crossflow, Induced draft. One tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).
Building B	BCT2	2,900	1,856	858	4,380	51,480	Vertical discharge, Crossflow, Induced draft. One tower only (BCT1 or BCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.
Building C	CCT1	2,900	1,856	1,600	8,760	96,000	Vertical discharge, Crossflow, Induced draft. One tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).
Building C	CCT2	2,900	1,856	1,600	4,380	96,000	Vertical discharge, Crossflow, Induced draft. One tower only (CCT1 or CCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.
Building D	DCT1	2,900	1,856	1,787	8,760	107,220	Vertical discharge, Crossflow, Induced draft. One tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September).
Building D	DCT2	2,900	1,856	1,787	4,380	107,220	Vertical discharge, Crossflow, Induced draft. One tower only (DCT1 or DCT2) operates during colder months and both towers operate in summer months (i.e. July, August, and September). For emission estimation purposes assume on-line for 6 months of the year.
Building G	GCT1	2,900	1,856	3,000	8,760	180,000	Vertical discharge, Crossflow, Induced draft. Both towers (GCT1 and GCT2) are assumed to operate year round.
Building G	GCT2	2,900	1,856	3,000	8,760	180,000	Vertical discharge, Crossflow, Induced draft. Both towers (GCT1 and GCT2) are assumed to operate year round.

1. The web site http://www.lenntech.com/unit-conversion-calculator/tds_engels.htm provided the conversion from umho/cm to ppm.

Appendix G

Plot Plan

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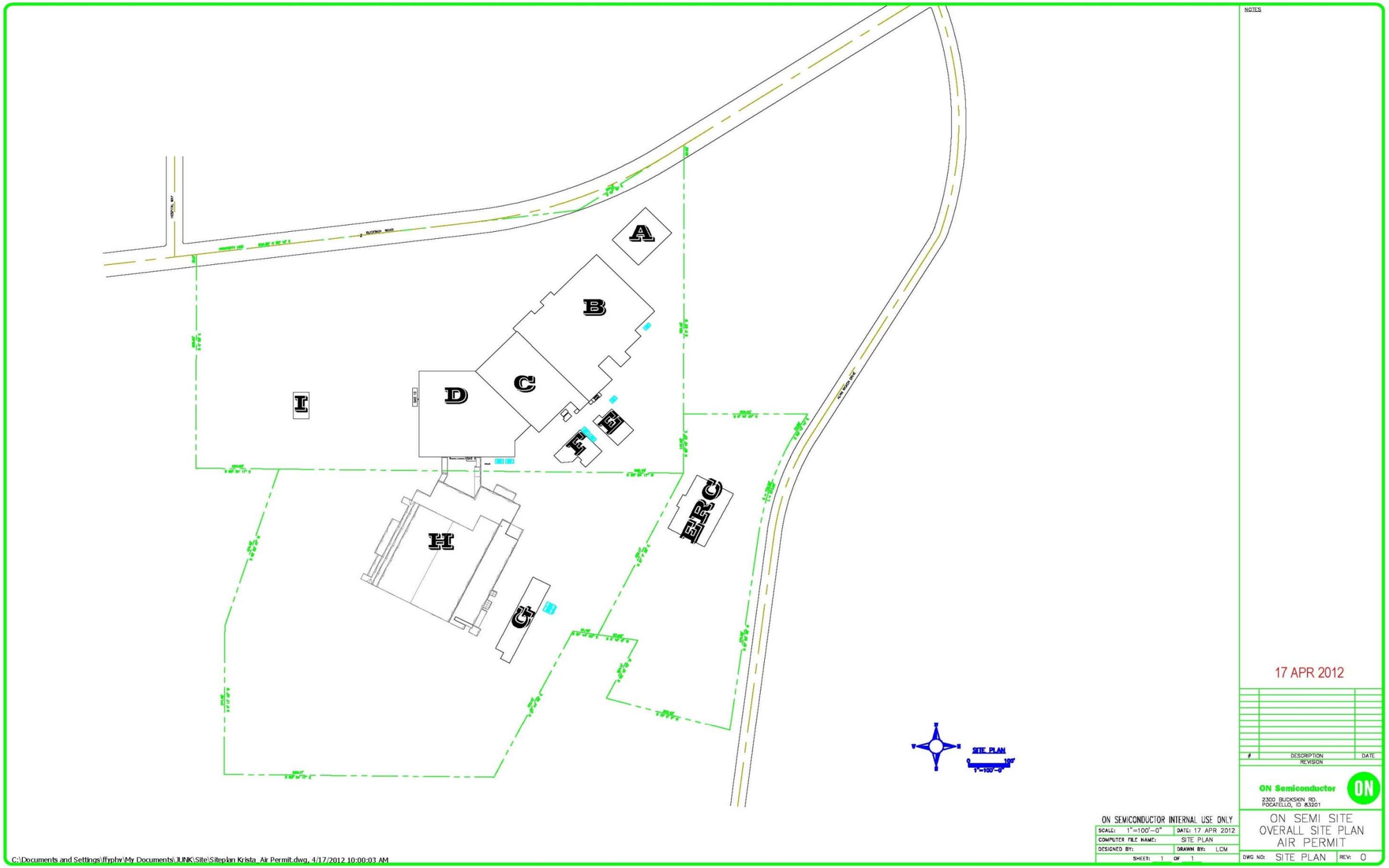
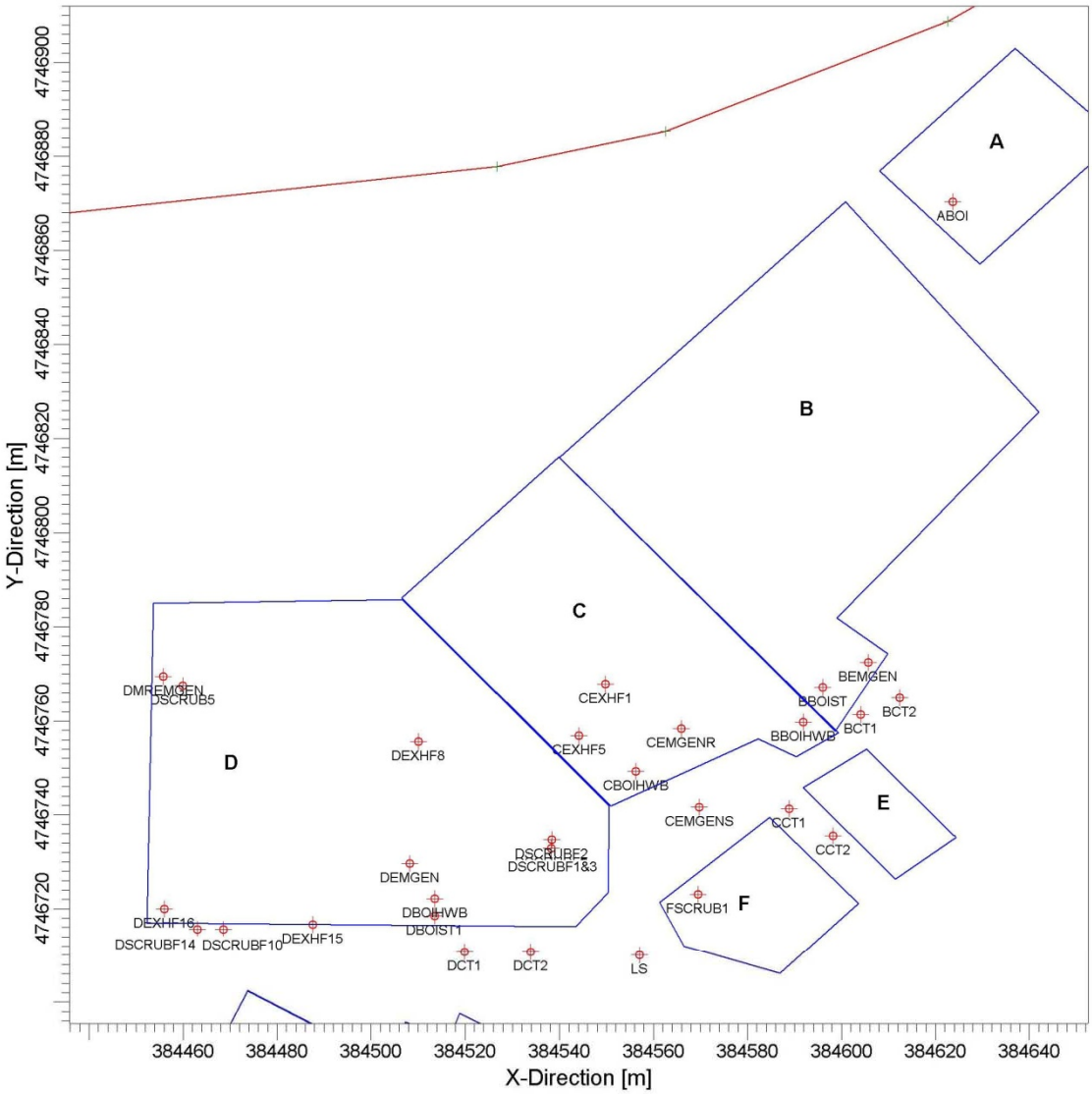
Plot Plan G-1
Sources North G-2
Sources South G-3

Plot Plan


NOTES
A
B
C
D
E
F
G
H
I
HRC
SITE PLAN
1"=100'-0"
17 APR 2012
DESCRIPTION
REVISION
DATE
ON Semiconductor
2300 BUCKSKIN RD.
POCATELLO, ID 83201
ON SEMI SITE
OVERALL SITE PLAN
AIR PERMIT
DWG NO: SITE PLAN
REV: 0
ON SEMICONDUCTOR INTERNAL USE ONLY
SCALE: 1"=100'-0"
DATE: 17 APR 2012
COMPUTER FILE NAME: SITE PLAN
DESIGNED BY:
DRAWN BY: LCM
SHEET: 1 OF 1
C:\Documents and Settings\ffyphw\My Documents\JUNK\Site\Siteplan Krista_Air Permit.dwg, 4/17/2012 10:00:03 AM

Sources North

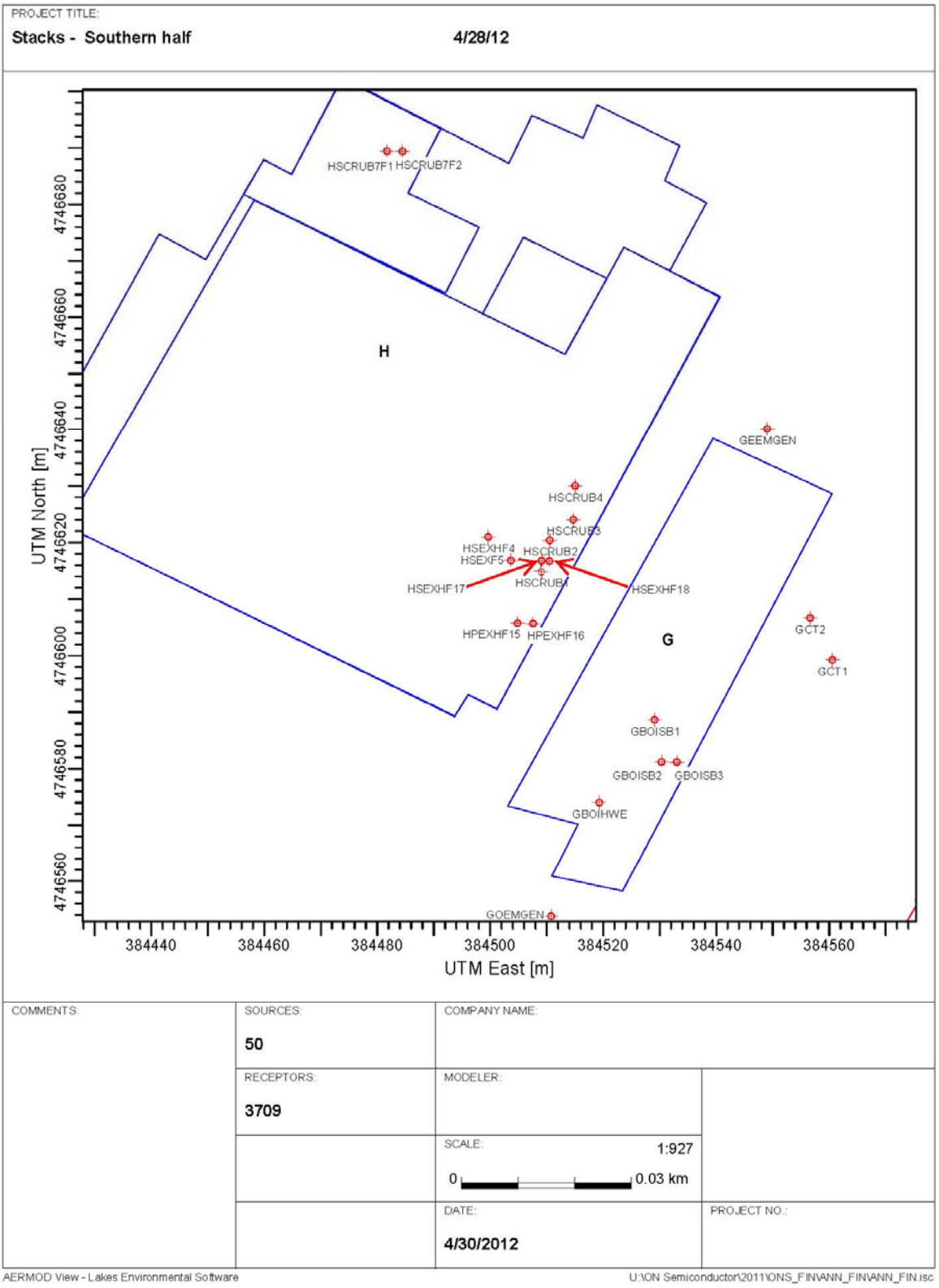
PROJECT TITLE:
Stacks - Northern half **7/13/12**



COMMENTS:	SOURCES: 50	COMPANY NAME:	
	RECEPTORS: 3709	MODELER:	
		SCALE: 1:1,362 (0 – 0.04 km)	
		DATE: 7/18/2012	PROJECT NO.:

AERMOD View - Lakes Environmental Software U:\ON Semiconductor\2012\1HR_FINAL\1HR_FINAL.isc

Sources South



Appendix H

Topographic Features

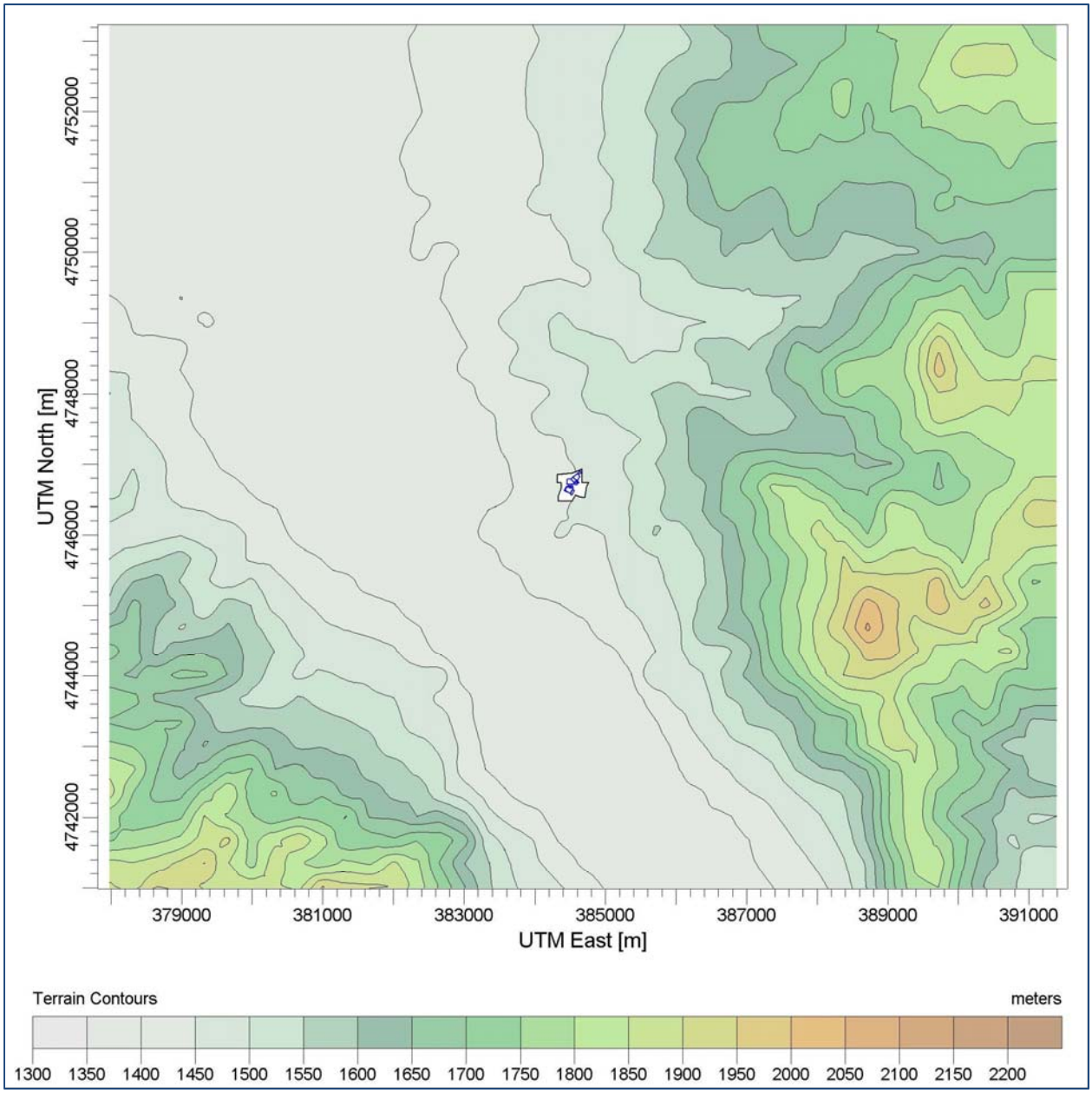


Figure 1. Topographic Map of the ONS Facility and Surrounding Area.

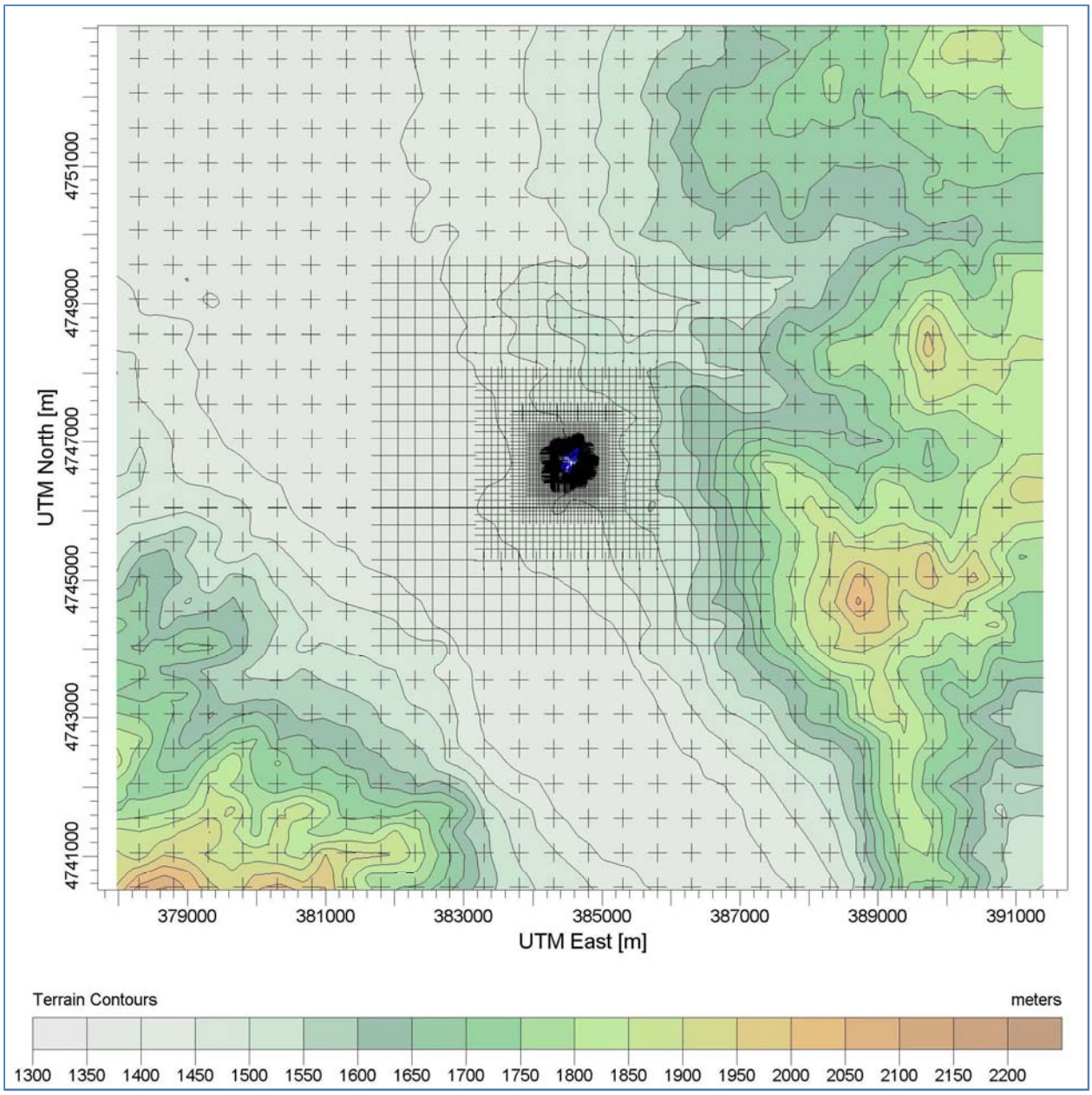


Figure 2. Topographic Map of the ONS Facility and Surrounding Area with Receptor Network.

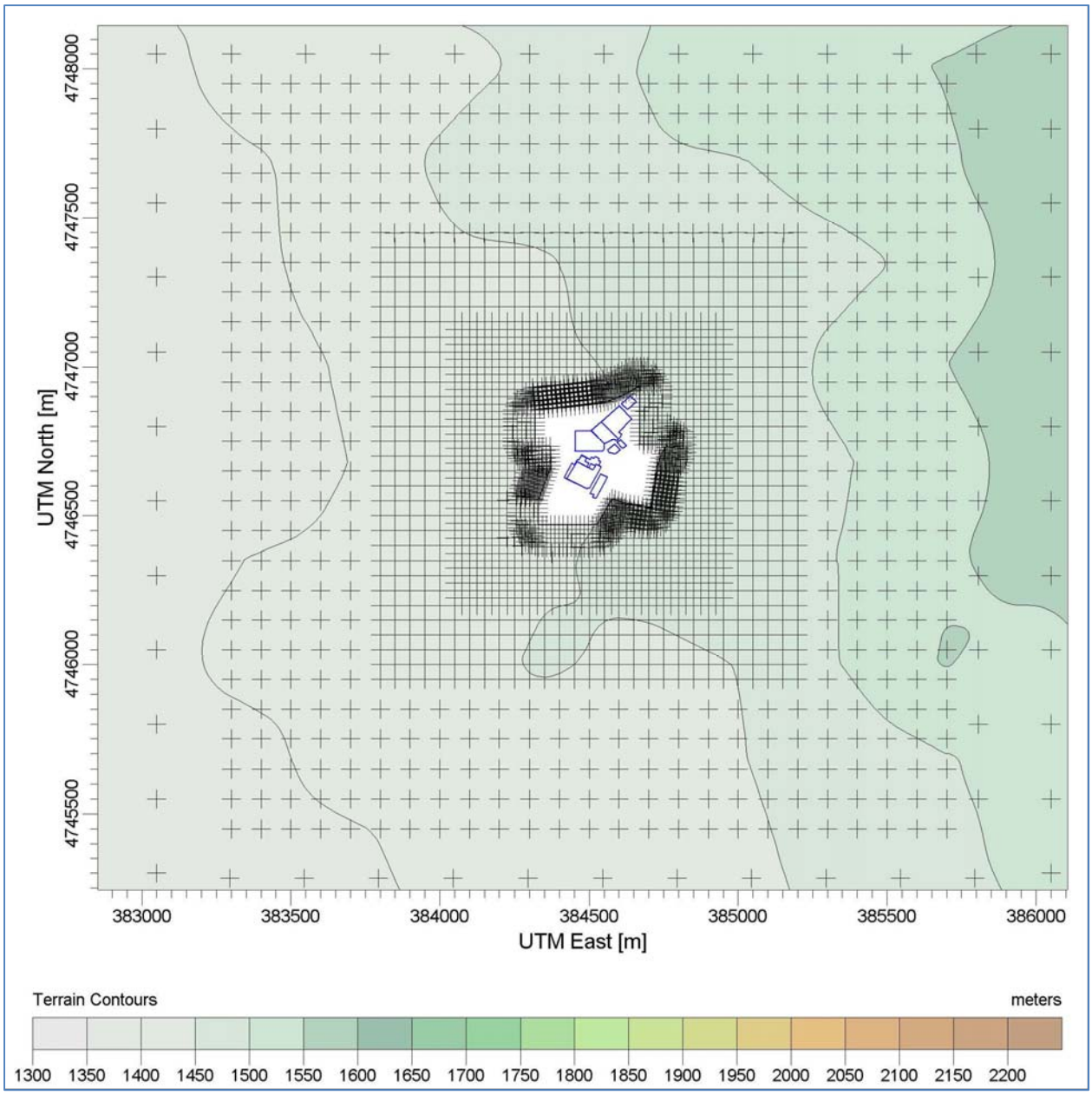


Figure 3. Topographic Map of the ONS Facility and Surrounding Area with Inner Receptor Network.

Appendix I

ON Semiconductor Modeling Protocol Approval

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

June 20, 2011

VIA EMAIL

Ms. Krista Johnston
ON Semiconductor, Inc.
2300 Buckskin Road
Pocatello, Idaho 83201

RE: Facility ID No. 005-00017, ON Semiconductor, Inc. (formerly AMI Semiconductor, Inc.) Modeling Protocol Approval for the Initial FEC PTC for an Existing Manufacturing Facility, Revision 1

Dear Ms. Johnston:

The Department of Environmental Quality (DEQ) received a dispersion modeling protocol on October 22, 2010 for an initial permit to construct (PTC) for this existing integrated circuit manufacturing facility located in Pocatello. The facility was constructed in about 2001 by AMI Semiconductor, Inc. In December of 2007, AMI Semiconductor was acquired by Phoenix, Arizona-based ON Semiconductor, Inc. The modeling protocol proposes methods for use in the ambient impact analyses to support obtaining a Facility Emissions Cap (FEC) permit per IDAPA 58.01.01.175-181 for emissions of PM_{10}, CO, NO_x, SO_2, VOCs, and HAPs from this facility.

The modeling protocol was reviewed and on February 14, 2011, DEQ approved the protocol with comment (Comments 1 through 13). Modeling was delayed awaiting availability of the Lakes AERMOD View graphical user interface incorporating the most recent EPA version of AERMOD (v. 11103), which incorporated significant changes to the program for modeling 1-hour NO_x and SO_2. Lakes AERMOD View v.7.0.2 was made available on May 13, 2011.

Although EPA had issued guidance with regard to modeling for the new 1-hour NO_x and SO_2 National Ambient Air Quality Standards (NAAQS), there was still a lot of uncertainty regarding the best (or better) ways to model emissions from intermittent sources, including emergency generators. DEQ's NSR Modeling Coordinator was a member of a joint EPA/State/Local working group assembled in Spring 2011 and tasked with reviewing modeling concerns for these 1-hour NAAQS. The group was scheduled to present its findings during the EPA Modelers Workshop scheduled for June 6-9, 2011 in Atlanta, Georgia. At DEQ's request, modeling for this project was delayed pending additional guidance from this workshop.

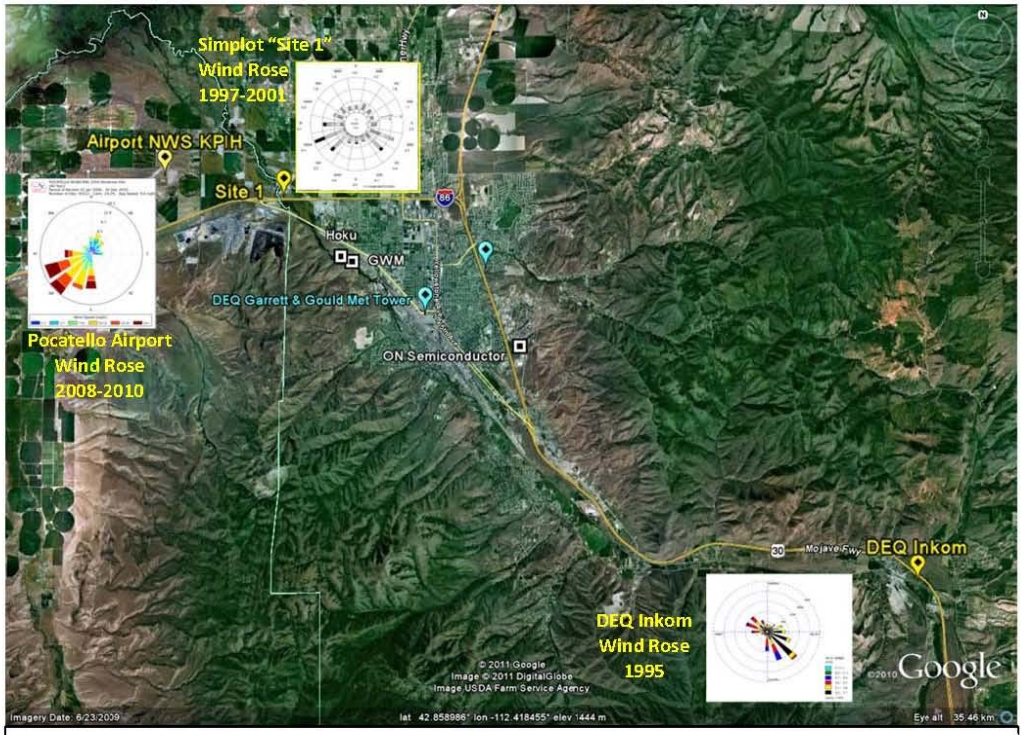
This revision to the February 14, 2011 protocol approval is based on information collected at the EPA workshop, additional review by DEQ of available meteorological data, and EPA guidance issued after February regarding appropriate 1-hour NO_x and SO_2 background values.

Comment 1. (Revised) DEQ recommends using the AERMOD-ready meteorological data set for Inkom for the year 1995. Applicants may also use the AERMOD-ready Simplot Don Plant (Site 1) data set for the years 1997-2001. Zipped files containing these data files are included with the email transmitting this letter.

DEQ has determined that the Inkom data set is the best representative set that is readily available for minor source projects located in Pocatello, based on the following considerations:

- As shown in Figure 1, winds at the Pocatello airport are affected primarily by the dominant winds along the Snake River plain. The wind rose for data collected at "Site 1"

near the Simplot Don Plant illustrate that this location near the mouth of the Portneuf Valley is affected by both the dominant Snake River plain wind flow and the valley flows. The wind rose for the Inkom data shows a more typical pattern for a valley location, with the dominant wind directions aligned with the valley terrain.



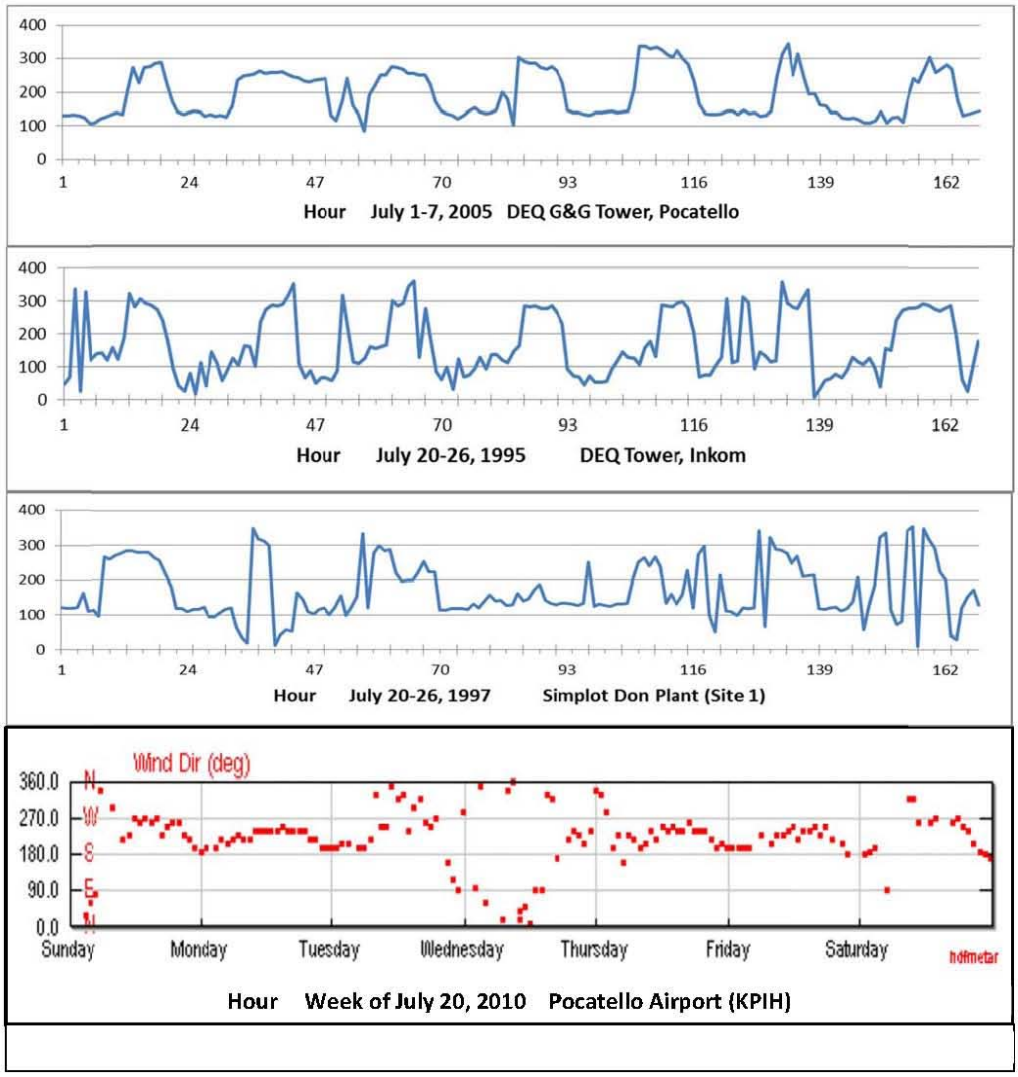
- The effects of terrain and heating and cooling cycles during the day in the Portneuf River Valley produce diurnal winds characterized by a reversal of daytime and nighttime wind direction. As a result of differential daytime warming at the valley floor compared to the ridgetops, winds tend to flow upslope and up-valley during the day. During the cooler hours of the night, the direction reverses, with winds flowing downslope and down-valley from the upper reaches of the valley to the Snake River Plain.

  A comparison of daily wind directions for Pocatello, Inkom, Simplot Don Plant (Site 1), and the Pocatello Airport (KPIH) is shown in Figure 2.[1] Data collected at a DEQ meteorological tower located near the intersection of Garrett Way Boulevard and Gould Street (G & G) in Pocatello would be the best data to use for minor sources located up-valley from the Snake River plain, but do not meet minimum criteria for use in NSR modeling.[2] The plot of wind directions during a week in July at the G & G site clearly

[1] Plots were developed using DEQ G&G 2005 raw met data, the 1995 Inkom.sfc file, the 1997 Site1.sfc file, and historical Pocatello airport data from Weather Underground, accessed June 17, 2011 at www.wunderground.com.

[2] Unfortunately, these data are at best 50% complete (based on 2005 and 2006), so do not meet the minimum 90% completeness criterium for use in NSR modeling.

shows the effect of mountain diurnal winds, as does the plot for the Inkom site. The plot showing daily wind directions at Site 1 shows less influence from diurnal flows, and the Pocatello Airport plot indicates that the effect of diurnal wind flows from the Portneuf River Valley is much less pronounced compared to the other locations.



– Although the Inkom data consists of only a single year, in consultation with a DEQ meteorologist, Chris Ramsdell, data collected during 1995 at the met tower in Inkom were determined to be the best representative readily-available data for minor sources located up-valley in Pocatello.

Comment 2. A review of the legislative intent of Section 750 of the Idaho Air Rules, "Rules for Control of Fluoride Emissions," clarified that the requirements of that section apply only to phosphate fertilizer plants. With regard to fluoride emissions from ON Semiconductor's Pocatello operations, you must demonstrate compliance only with the toxic air pollutant standards contained in Section 210, *et seq.*, of the Rules.

Comment 3. DEQ concurs that the "Chi over Q" approach described in the modeling protocol is appropriate for the purposes of this project.

Comment 4. DEQ concurs that rural dispersion coefficients are appropriate for this plant location.

Comment 5. The use of the AERMOD beta option for capped and/or horizontal point source emissions is approved for this project. Using this option typically provides more representative results for capped or horizontal stacks, especially for stacks subject to downwash.

Comment 6. The application should provide documentation and justification for all stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated. In most instances, applicants should use typical parameters, not maximum temperatures and flow rates. Please include the documentation provided by equipment vendors if this is used as the basis for exhaust parameters.

Comment 7. A detailed review of the emissions will be conducted as part of the review once the application is submitted. Pound-per-hour emission values used in the dispersion modeling should be double-checked, however, to ensure that they reflect the appropriate averaging period, e.g., noncarcinogenic toxic air pollutant (TAP) emissions should reflect a 24-hour average, and carcinogenic TAP emissions should reflect an annual average.

Comment 8. Engine Generators.

- Please be advised that the AP-42 emission factors for engine generators are based on the brake horsepower or kilowatt rating of the engine, not the power output from the generator.
- For demonstration of compliance with short-term standards, please describe any assumptions regarding the number of hours per day each of the engines will operate, and whether the engines are presumed to operate concurrently.
- Please justify any generator exhaust velocities greater than 50 meters per second.

Comment 9. (Revised) DEQ modeling thresholds have recently been updated. Please compare your facility-wide emissions to the "Threshold I" values shown in Table 1.

Table 1. DEQ MODELING THRESHOLDS

Criteria Air Pollutants	Averaging Period	DEQ Modeling Threshold			
		Threshold I		Threshold II (Case-by-Case)	
PM_{10}	24-hr	0.22	lb/hr	2.6	lb/hr
$PM_{2.5}$	24-hr	0.054	lb/hr	0.63	lb/hr
	Annual	0.35	T/yr	4.1	T/yr
CO	1-hr, 8-hr	15	lb/hr	175	lb/hr
NO_2	1-hour	0.20	lb/hr	2.4	T/yr
	Annual	1.2	T/yr	14	T/yr
SO_2	1-hr	0.21	lb/hr	2.5	lb/hr
	24-hr	0.22	lb/hr	2.6	lb/hr
	Annual	1.2	T/yr	14	T/yr
Lead	3-month rolling avg	14	lb/mo		

Comment 10. (Revised to include modeled value if only a single year of met data is used). Modeling is required for each of the criteria pollutants and averaging times shown in solid black text in Table 2, if facility-wide emissions exceed DEQ modeling thresholds. The significant contribution levels (SCLs) and the modeled value that must be used for comparison to the NAAQS for full-impact analyses are also listed in Table 2. The highest 1st high value for any pollutant and averaging time must be used for significance analyses.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels ($\mu g/m^3$)	Regulatory Limit ($\mu g/m^3$)	Modeled Value Used 1 yr onsite or < 5 yrs rep.met / 5 yrs representative met
PM_{10}	24-hour	5.0	150	Maximum 2nd / 6th highest
$PM_{2.5}$	Annual	0.3	15	Maximum 1st / 1st high
	24-hour	1.2	35	Maximum 1st / 1st high
Carbon monoxide (CO)	8-hour	500	10,000	Maximum 2nd / 2nd highest
	1-hour	2,000	40,000	Maximum 2nd / 2nd highest
Sulfur Dioxide (SO_2)	Annual	1.0	80	Maximum 1st/ 1st highest
	24-hour	5	365	Maximum 2nd / 2nd highest
	3-hour	25	1,300	Maximum 2nd / 2nd highest
	1-hour	EPA Interim: 3 ppb (7.8 $\mu g/m^3$)	0.075 ppm (196 $\mu g/m^3$)	The maximum 4th highest value for each year averaged for all years modeled.
Nitrogen Oxides (as NO_2)	Annual	1.0	100	Maximum 1st / 1st highest
	1-hour n	EPA Interim: 4 ppb (7.5 $\mu g/m^3$)	0.100 ppm (188.7 $\mu g/m^3$)	The maximum 8th highest value for each year averaged for all years modeled.
Lead (Pb)	Rolling 3-month average	NA	0.15	Maximum 1st / 1st highest

Comment 11. (Incorporated DEQ protocol approval addendum dated March 31, 2011). Background concentrations must be added to modeling results for criteria pollutants if maximum modeled concentrations exceed significant contribution levels. DEQ recommends using the background concentrations shown in Table 3, which have been updated to reflect recent data collected at Pocatello-area monitors.

Table 3. POCATELLO BACKGROUND CONCENTRATIONS – UPDATED 3-31-11

Pollutant	Averaging Period	Background Concentration (ppb)	Background Concentration ($\mu g/m^3$)	NAAQS	Background Value Reference
PM_{10}	24-hour	---	68	150 $\mu g/m^3$	2nd Highest of 1st highest monitored values, 2005-2009 (Pocatello, Garrett & Gould monitor)
$PM_{2.5}$	24-hour	---	27.6	35 $\mu g/m^3$	3-yr average of 98th percentile values, 2004-2006 Pocatello, Garrett & Gould monitor
	Annual	---	7.8	15 $\mu g/m^3$	3-yr average of annual averages, 2004-2006 Pocatello, Garrett & Gould monitor
Carbon monoxide (CO)	1-hour	Not updated	Default 15,600	9,000 ppb (10,000 $\mu g/m^3$)	Default: Urban >45,000
	8-hour	Not updated	Default 5,200	35,000 ppb (40,000 $\mu g/m^3$)	Default: Urban > 45,000

Table 3. POCATELLO BACKGROUND CONCENTRATIONS – UPDATED 3-31-11

Pollutant	Averaging Period	Background Concentration (ppb)	Background Concentration ($\mu g/m^3$)	NAAQS	Background Value Reference
Nitrogen dioxide (NO_2)	1-hour	2004: 38.5	2004: 72	100 ppb (188 $\mu g/m^3$)	98th percentile of monitored values, 2004 Tribal Monitor, Chubbuck
	Annual	2004: 6.4	2004: 12	53 ppb (100 $\mu g/m^3$)	Annual mean of monitored values, 2004 Tribal Monitor, Chubbuck
Sulfur dioxide (SO_2)	1-hour	n/a	n/a	75 ppb	Not applicable. Emissions are below DEQ modeling thresholds.
	3-hour	2005-2009: 62	2005-2009: 161	500 ppb (1,300 $\mu g/m^3$)	Highest 2nd high 3-hour block avg monitored value, 2005-2009 Pocatello, STP/Batiste & Chubbuck Rd
	24-hour	2005-2009: 24	2005-2009: 63	140 ppb (365 $\mu g/m^3$)	Highest 2nd high 24-hour monitored value, 2005-2009 Pocatello, STP/Batiste & Chubbuck Rd
	Annual	2003-2007: 5.1	2003-2007: 13.4	30 ppb (80 $\mu g/m^3$)	2nd highest annual average monitored value, 2003-2007 Pocatello, STP/Batiste & Chubbuck Rd
Lead (Pb)	Rolling 3-month average	Not updated	Default 0.04	0.15 $\mu g/m^3$	Default: Urban > 45,000

ppb = parts per billion by volume $\mu g/m^3$ = micrograms per cubic meter

"Default" values were taken from Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Idaho DEQ, Memorandum to Mary Anderson, March 14, 2003.

Comment 12. The proposed receptor grid appears reasonable. However, it is the applicant's responsibility to use a sufficiently tight receptor network such that the maximum modeled concentration is reasonably resolved. If DEQ conducts verification modeling analyses with a tighter receptor grid and compliance with standards is no longer demonstrated, the permit will be denied.

Comment 13. Incorporated DEQ protocol approval addendum dated March 31, 2011, and revised to include updated guidance from the EPA Modelers Workshop held June 6-9, 2011.

1-hour NO_x modeling

- Use 0.80 (80%) as a default ambient NO_2 /NO_x ratio for the 1-hour NO_2 standard under the EPA's Tier 2 option. Note that you may still use 75% for this ratio for annual NO_x modeling.
- Emergency generator engines with routine testing fewer than 8 times per year could not cause the 8th high NO_2 design value to exceed the NAAQS. If this is the case, generator emissions need not be included in the total emissions for comparison to DEQ modeling thresholds. For facilities with more than one engine generator, this may require that all engines are tested on the same day.
- NO_2 emissions from emergency generator engines subject to more frequent testing must be included in the total emissions for comparison to DEQ modeling thresholds, and included in the modeling if emissions exceed the thresholds.
- Testing schedules for intermittent sources should consider avoiding morning and evening commute hours, periods with inversion/stagnant air conditions, periods when a local ordinance burn ban is in effect (i.e., when air quality is poor), and should consider testing during daytime hours rather than during the night when dispersion conditions are typically less favorable.

Additional informal guidance from 2011 EPA Modelers Workshop, 1-hour NO_x modeling

- Use concatenated SFC and PFL meteorology files for 1-hour NO_x and 1-hour SO_2 modeling. Files for individual years can be combined using a text editor.

- PVMRM/OLM scenarios must be run separately. For other pollutants, using Source Groups is a typical method used to estimate impacts for different scenarios, e.g., with and without generators or with and without emissions from co-contributing sources. Calculations of the NO_x/ozone atmospheric chemistry in AERMOD are based on <u>all</u> NO_x-emitting sources listed in the model input. There are currently no provisions in AERMOD to recalculate the NO_x/ozone levels based on the emissions from each source group.
- Modeling negative emissions from sources that have been removed can be tricky when using PVRMR/OLM. The analysis may need to be separated into two runs: one for the new proposed emissions and a second run for the negative emissions. It appears that you will need to generate post files for each run and then manually combine the values to assess the net impact.
- Monte Carlo approach for intermittent sources. This approach is rather labor intensive but would allow a more realistic assessment of periodic emissions. DEQ has not yet evaluated this specific approach, but would be willing to consider this or similar approaches for minor sources. Clint Bowman of Washington's Department of Ecology presented the following option in an impromptu session:

  1) Run AERMOD for sources assuming each source operates during each day and hour it could potentially operate. For example, if an engine would be tested only during daylight hours it would be modeled for 365 days per year, but only during daylight hours. Set AERMOD to write a post file of maximum daily 1-hour concentrations for each receptor (maximum daily concentrations for each day in the met data set).
  2) Determine the maximum operational schedule. For example, engines being tested for 2 hours every week.
  3) Randomly select operational days based on the operational schedule. Pull the maximum 1-hour concentrations from the post file for those operational days and compute the 98th percentile for each receptor.
  4) Repeat Step 3 at least 1,000 times.
  5) Use the median value of the 1,000 runs as the design value.

Comment 14. (New) Hourly NO_2 and Ozone Values for PVMRM/OLM

Hour by hour background NO_2 data were based on monitoring data collected between June 2009 and June 2010 in Meridian Idaho. A separate background value was generated for each hour of the day, based on the 2nd highest value monitored for that hour in the year-long dataset.

Hourly ozone data were taken from the 2007 study, Ozone and its Precursors in the Treasure Valley, Idaho (final report, May 2008, Desert Research Institute). Hourly data were collected from Parma Idaho from June 27, 2007 through October 12, 2007. These data were sorted by hour and then the mean and the standard deviation was calculated for each hour across all days. For each hour modeled, a background ozone value equal to the mean plus one standard deviation was generated

ON Semiconductor, Inc., Pocatello
Revision 1, June 20, 2011
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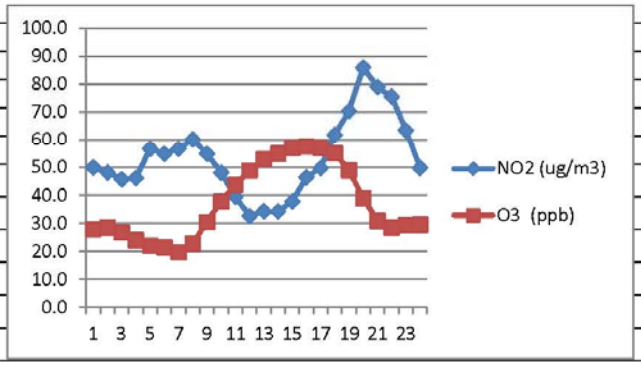
Table 4. HOURLY NO_2 AND OZONE BACKGROUNDVALUES FOR USE WITH PVMRM/OLM NOx MODELING

Hour	NO_2 ($\mu g/m^3$)	Ozone, O_3 (ppb)
1	50.0	27.9
2	48.1	28.5
3	45.7	26.8
4	46.2	24.1
5	56.7	22.1
6	54.9	21.4
7	56.7	19.7
8	60.1	22.8
9	54.9	30.5
10	48.1	37.8
11	39.5	43.8
12	32.6	48.8
13	34.3	53.0
14	34.3	55.0
15	37.8	57.1
16	46.4	57.6
17	49.8	57.1
18	61.8	55.1
19	70.4	49.0
20	85.9	39.0
21	79.0	30.9
22	75.5	28.5
23	63.5	29.4
24	49.8	29.6



DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the State of Idaho Air Quality Modeling Guideline, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP, raw meteorological data files, AERMET input and output files, and AERMAP input and output files) are submitted with an analysis report if a different dataset than provided to you by DEQ is used for this project. If you have any further questions or comments, please contact me at (208) 373-0220.

Sincerely,

Cheryl Robinson

Cheryl A. Robinson, P.E., Modeling Analyst, Air Quality Division

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