



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



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**Fairchild Semiconductor Corporation
Cumberland County
South Portland, Maine
A-370-71-Z-R/A (SM)**

**Departmental
Findings of Fact and Order
Air Emission License
Renewal/Amendment**

FINDINGS OF FACT

After review of the air emissions license renewal and amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (M.R.S.A.), §344 and §590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

Fairchild Semiconductor Corporation (Fairchild Semiconductor) has applied to renew and amend their Air Emission License permitting the operation of emission sources associated with the production of micro-circuits on thin silica wafers at its semiconductor manufacturing facility.

The amendment includes the replacement of Boilers 3 and 4 with two smaller units, the removal of four units previously located in the Chemical building, revised requirements for the acid/alkaline scrubbers, removal of the greenhouse gases annual limit, small correction in the NO_x tons per year annual equation, inclusion of federal requirements for the boilers and generators, and a revision to the generators' diesel fuel sulfur content and opacity requirements.

The equipment addressed in this license is located at 333 Western Avenue, South Portland, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license:

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

Boilers and VOC Unit Burner

<u>Equipment</u>	<u>Maximum Input Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate</u>	<u>Fuel Type, % sulfur</u>	<u>Date of Manuf.</u>	<u>Stack #</u>
Boiler 1	12.53	89.5 gal/hr	Distillate fuel	1982	2
		12,165 scf/hr	Natural gas		
Boiler 2	20.9	149.2 gal/hr	Distillate fuel	1980	2
		20,097 scf/hr	Natural gas		
Boiler 3 (replacement)	14.0	14,002 scf/hr	Natural gas	2014	2
Boiler 4 (replacement)	14.0	14,002 scf/hr	Natural gas	2014	2
VOC Abatement Unit	4.0	3883 scf/hr	Natural Gas	1996	3
		42.55 gal/hr	Propane back-up		

- Table Notes:
- Previously licensed Boiler 3 (20.9 MMBtu/hr) and Boiler 4 (21.2 MMBtu/hr) have been removed from the facility.
 - Firing rates for Boilers 1 and 2 were initially based on #6 fuel oil. The firing rates have been adjusted using distillate oil heat content (0.14 MMBtu/gal).

Generators

<u>Equipment</u>	<u>Maximum Input Capacity (MMBtu/hr)</u>	<u>Firing Rate (gal/hr)</u>	<u>Rated Output Capacity</u>	<u>Fuel Type</u>	<u>Date of Manufacture</u>	<u>Date of Installation</u>
Fire Pump	0.7	5.3	85 Hp	Distillate fuel	1966	1966
Generator 1	2.2	16.1	228 kW	Distillate fuel	1996	1999
Generator 3	2.2	16.1	205 kW	Distillate fuel	1993	1993
Generator 4	4.5	32.8	500 kW	Distillate fuel	1994	1994
Generator 5	4.2	30.5	400 kW	Distillate fuel	2002	2004

Process Equipment and Vents

The following process vents are currently active and are listed individually for descriptive purposes. The tools and processes associated with the vents may change as operational updates are made at the facility.

Process ID (fan/exhaust no.)	Control Type
Building 1	
EF 1-11 (wafer sort)	N/A
Building 2	
EF 2-1	Wet Scrubber
EF 2-1A	Wet Scrubber
EF 2-45 A & B	Wet Scrubber
EF 2-2, EF 2-15, EF 2-18 A & B, EF 2-20, EF 2-23, EF 2-25, EF 2-50, EF 2-63, EF 2-66 A & B	N/A
Building 4	
EF 4-1 (rooms 400, 403, 404)	Wet Scrubber
EF 4-4 (room 405)	Fabric Filter
EF 4-2	N/A
Building 5	
EF 5-13	Wet Scrubber
EF 5-14	Wet Scrubber
EF 5-33 A & B	Wet Scrubber
EF 5-10 A & B, EF 5-24/25	N/A
Building 6	
EF 6-2	Emergency Release Scrubber
Building 12	
EF 12-209	Wet Scrubber
EF 12-330 (plant-wide VOC)	VOC Collection and abatement
EF 12-302, EF 12-322, EF 12-335, EF 12-337	N/A
Building 17	
EF 17-101/103	Wet Scrubber
EF 17-102	Wet Scrubber
EF 17A-67 A & B, EF 17-104	N/A

Table Notes: - Four units in the Chemical Building (Building 12) listed on the previous license have ceased operation and the equipment has been removed, including EF-12-329, EF 12-331, EF 12-332, and EF 12-336.

Fairchild Semiconductor operates two 30 gallon solvent degreasers at the facility. One utilizes the solvent Simple Green (0% VOC) and one utilizes Tekusolv II Red (100% VOC).

Fairchild Semiconductor also has insignificant activities including, but not limited to, storage tanks (fuel oil, diesel, waste solvent, liquid hydrogen, liquid nitrogen, liquid argon), heat exhaust vents, and natural gas-fired burn boxes.

C. Application Classification

The application for Fairchild Semiconductor does not include the licensing of increased facility-wide emissions, but does include the installation of two replacement boilers. Therefore, the license is considered to be both a renewal and amendment and has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 Code of Maine Rules (CMR) 115 (as amended). With the annual limits, the facility is licensed below the major source thresholds for criteria pollutants and is considered a synthetic minor. With the annual limits, the facility is licensed below the major source thresholds for hazardous air pollutants (HAP) and is considered an area source of HAP.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

B. Process Description

Fairchild Semiconductor manufactures semiconductors on eight inch silicon wafers. Each type of semiconductor manufactured goes through the same general process steps, but the complexity and structural makeup between the products are slightly different. Oxide and metallic layers are built up on the blank wafers using various chemical or process parameters to produce layers at the required specifications. The manufacturing processes include repeated batch operation steps such as precleaning, doping, photo mask development, etching, backgrinding, and cleaning.

The wafers are first pre-cleaned with chemicals in cleaning tanks for a specific period of time. After each cleaning tank, the wafers are rinsed with de-ionized water. Following the pre-cleaning steps, the wafers are sent to diffusion furnaces where the initial layer of

oxide is grown on the wafer. Depending on the stage of the oxide layer growth, layer number or product type, the operating parameters may vary significantly. The introduction of impurities (doping) may occur in the diffusion chambers if required.

After oxidation, the wafers are placed on photoresist coating equipment. The wafers are dried, then photoresist (a light sensitive chemical) is applied. The wafers are baked and are exposed to a light beam shot through a mask containing the desired network configuration. After exposure, the wafer is developed using a photoresist fixer. The network configuration copied onto the wafer serves as a pattern for the next step in the process.

Before etching, some wafers are sent to the ion implanting area. Impurities are deposited into the layer(s) using a high speed particle accelerator. Etching removes the oxide which was not fixed in the development stage. Either a gas or liquid chemical process is used for this removal. After etching, the remaining photoresist on top of the fixed portion of the wafer is stripped with sulfuric acid/hydrogen peroxide mix or carbon tetrafluoride and oxygen.

After the required layers are formed, the wafers are transferred to another room where the back side of the disk is ground down to specifications. The wafers are packaged and shipped to another Fairchild plant for testing and assembly into the finished product.

Semiconductor fabrication makes use of various acids, alkalis, and VOC containing solvents in the different manufacturing tools utilized in each step. Tools are defined as chemical baths consisting of acids or alkalis or solvents. The VOC emitting tools are controlled with a VOC abatement unit during April 1 to September 30, which includes the ozone season. The acid and alkali tools are controlled with wet scrubbers.

C. Existing Boilers 1 and 2 and Replacement Boilers 3 and 4

Fairchild Semiconductor will operate four boilers exhausting through a common 110 foot stack (stack 2).

Boilers 1 and 2 are existing boilers which can fire either natural gas or distillate fuel. Boiler 1, manufactured and installed in 1982, is rated at a maximum heat input capacity of 12.53 MMBtu/hr (89.5 gal/hr of distillate fuel, 12,165 scf/hr of natural gas) and Boiler 2, manufactured and installed in 1980, is rated at a maximum heat input capacity of 20.9 MMBtu/hr (149.2 gal/hr of distillate fuel, 20,097scf/hr of natural gas). The distillate fuel fired in the units shall meet the requirements of ASTM D396 #2 fuel oil (no greater than 0.5% sulfur, by weight).

Boilers 3 and 4 are natural gas fired units, replacing the previous dual fuel boilers which were rated at 20.9 MMBtu/hr and 21.2 MMBtu/hr. The previously licensed units have been removed from the site. Replacement Boilers 3 and 4, manufactured in 2014, are

each rated at a maximum heat input capacity of 14.0 MMBtu/hr (14,002 scf/hr of natural gas).

Due to the year of manufacture, Boilers 1 and 2 are not subject to the New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, for units greater than 10 MMBtu/hr manufactured after June 9, 1989.

Replacement Boilers 3 and 4 are subject to 40 CFR Part 60, Subpart Dc.

1. BACT/BPT Findings

The BACT/BPT emission limits for the boilers were based on the following:

Distillate Fuel

- PM/PM₁₀ – 0.1 lb/MMBtu based on the previous license
- SO₂ – based on firing ASTM D396 compliant #2 fuel oil (0.5% sulfur by weight)
- NO_x – 0.3 lb/MMBtu based on the previous license
- CO – 5 lb/1000 gal based on AP-42, Table 1.3-1, dated 5/10
- VOC – 0.2 lb/1000 gal based on AP-42, Table 1.3-3, dated 5/10

Natural Gas

- PM/PM₁₀ – 0.01 lb/MMBtu based on the previous license and 06-096 CMR 115, BACT
- SO₂ – 0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
- NO_x – 100 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
- CO – 84 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
- VOC – 5.5 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98

The BACT/BPT emission limits for the boilers are the following:

<u>Unit</u>	<u>Fuel</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>
Boiler 1	Distillate fuel	PM	0.1
	Natural gas		0.01
Boiler 2	Distillate fuel	PM	0.1
	Natural gas		0.01
Boiler 3	Natural gas	PM	0.01
Boiler 4	Natural gas	PM	0.01

Unit	Fuel	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler 1 (12.53 MMBtu/hr)	Distillate fuel	1.25	1.25	6.31	3.76	0.45	0.02
	Natural gas	0.13	0.13	0.01	1.22	1.02	0.07
Boiler 2 (20.9 MMBtu/hr)	Distillate fuel	2.09	2.09	10.42	6.21	0.74	0.03
	Natural gas	0.21	0.21	0.01	2.01	1.69	0.11
Boiler 3 (14.0 MMBtu/hr)	Natural gas	0.14	0.14	0.01	1.36	1.14	0.07
Boiler 4 (14.0 MMBtu/hr)	Natural gas	0.14	0.14	0.01	1.36	1.14	0.07

Visible emissions from the boilers' common stack (stack 2) shall not exceed 20% opacity on a 6 minute block average, except for no more than three (3) six (6) minute block averages in a 3 hour period, based on BACT.

Prior to July 1, 2016, or by the date otherwise stated in 38 MRSA §603-A(2)(A)(3), the distillate fuel fired at the facility shall be ASTM D396 compliant #2 fuel oil (maximum sulfur content of 0.5% by weight). Per 38 MRSA §603-A(2)(A)(3), beginning July 1, 2016, or on the date specified in the statute, the facility shall fire distillate fuel with a maximum sulfur content limit of 0.005% by weight (50 ppm), and beginning January 1, 2018, or on the date specified in the statute, the facility shall fire distillate fuel with a maximum sulfur content limit of 0.0015% by weight (15 ppm). The specific dates contained in this paragraph reflect the current dates in the statute as of the effective date of this license; however, if the statute is revised, the facility shall comply with the revised dates upon promulgation of the statute revision.

2. Periodic Monitoring

Periodic monitoring for the boilers shall include recordkeeping to document fuel use both on a monthly and 12 month rolling total basis. Documentation shall include certification of the type of fuel used and the fuel sulfur content, if applicable.

3. 40 CFR Part 63 Subpart JJJJJ

Boilers 1 and 2 are subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* (40 CFR Part 63 Subpart JJJJJ). The units are considered existing oil boilers. Replacement Boilers 3 and 4 are not subject to 40 CFR Part 63 Subpart JJJJJ since the units only fire natural gas.

A summary of the currently applicable federal 40 CFR Part 63 Subpart JJJJJ requirements is listed below. At this time, the Department has not taken delegation of

this area source MACT (Maximum Achievable Control Technology) rule promulgated by EPA, however Fairchild Semiconductor is still subject to the requirements. Notification forms and additional rule information can be found on the following website: <http://www.epa.gov/ttn/atw/boiler/boilerpg.html>.

a. Compliance Dates, Notifications, and Work Practice Requirements

i. Initial Notification of Compliance

An Initial Notification submittal to EPA was due no later than January 20, 2014. [40 CFR Part 63.11225(a)(2)]

ii. Boiler Tune-Up Program

(a) A boiler tune-up program was to be implemented to include the initial tune-up of applicable boilers no later than March 21, 2014 (for existing boilers). [40 CFR Part 63.11223]

1. Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. See chart below:

Boiler Category	Tune-Up Frequency
New or Existing Oil, Biomass and Coal fired boilers that are not designated as "Boilers with less frequent tune up requirements" listed below	Every 2 years
<i>New and Existing Oil, Biomass, and Coal fired Boilers with less frequent tune up requirements</i>	
Seasonal (see definition §63.11237)	Every 5 years
Limited use (see definition §63.11237)	Every 5 years
With a heat input capacity of <5MMBtu/hr	Every 5 years
Boiler with oxygen trim system which maintains an optimum air-to-fuel ratio that would otherwise be subject to a biennial tune up	Every 5 years

[40 CFR Part 63.11223(a) and Table 2]

2. The tune-up compliance report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured at high fire or typical operating load, before and after the boiler tune-up, a description of any corrective actions

taken as part of the tune-up of the boiler, and the types and amounts of fuels used over the 12 months prior to the tune-up of the boiler. [40 CFR Part 63.11223(b)(6)] The compliance report shall also include the company name and address; a compliance statement signed by a responsible official certifying truth, accuracy, and completeness; and a description of any deviations and corrective actions. [40 CFR Part 63.11225(b)]

(b) The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:

1. As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted; not to exceed 36 months from the previous inspection for boilers greater than 5 MMBtu/hr or 72 months from the previous inspection for oil fired boilers less than 5 MMBtu/hr, boilers with oxygen trim systems, seasonal boilers, and limited use boilers. [40 CFR Part 63.11223(b)(1)]
2. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 CFR Part 63.11223(b)(2)]
3. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted; not to exceed 36 months from the previous inspection for boilers greater than 5 MMBtu/hr or 72 months from the previous inspection for oil fired boilers less than 5 MMBtu/hr, boilers with oxygen trim systems, seasonal boilers, and limited use boilers. [40 CFR Part 63.11223(b)(3)]
4. Optimize total emissions of CO, consistent with manufacturer's specifications. [40 CFR Part 63.11223(b)(4)]
5. Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 CFR Part 63.11223(b)(5)]
6. If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 CFR Part 63.11223(b)(7)]

(c) After conducting the initial boiler tune-up, a Notification of Compliance Status should have been submitted to EPA no later than July 19, 2014. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(b)]

iii. Energy Assessment

Boilers 1 and 2 are subject to the energy assessment requirement as follows:

- (a) A one-time energy assessment was required to be performed by a qualified energy assessor on the applicable boilers no later than March 21, 2014. [40 CFR Part 63.11196(a)(3)]
- (b) The energy assessment was required to include a visual inspection of the boiler system; an evaluation of operating characteristics of the affected boiler systems, specifications of energy use systems, operating and maintenance procedures, and unusual operating constraints; an inventory of major energy use systems consuming energy from affected boiler(s) and which are under control of the boiler owner or operator; a review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage; a list of major energy conservation measures that are within the facility's control; a list of the energy savings potential of the energy conservation measures identified; and a comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.
[40 CFR Part 63, Table 2(4)]
- (c) A Notification of Compliance Status was required to be submitted to EPA no later than July 19, 2014. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(c)]

b. Recordkeeping

Records shall be maintained consistent with the requirements of 40 CFR Part 63 Subpart JJJJJ including the following [40 CFR Part 63.11225(c)]: copies of notifications and reports with supporting compliance documentation; identification of each boiler, the date of tune-up, procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned; documentation of fuel type(s) used monthly by each boiler; the occurrence and duration of each malfunction of the boiler; and actions taken during periods of malfunction to minimize emissions and actions taken to restore the malfunctioning boiler to its usual manner of operation. Records shall be in a form suitable and readily available for expeditious review.

EPA requires submission of Notification of Compliance Status reports for tune-ups and energy assessments through their electronic reporting system. [63.1125(a)(4)(vi)]

D. Fire Pump and Emergency Generators

Fairchild Semiconductor has a fire pump and four emergency generators. The units all fire distillate fuel. The Fire Pump, located in Building 3, was manufactured in 1966 and is rated at a maximum heat input capacity of 0.7 MMBtu/hr (5.3 gal/hr). Generator 1, located in the stack yard, was manufactured in 1996 and is rated at a maximum heat input capacity of 2.2 MMBtu/hr (16.1 gal/hr). Generator 3, located in Building 5, was manufactured in 1993 and is also rated at a maximum heat input capacity of 2.2 MMBtu/hr (16.1 gal/hr). Generator 4, located in Building 6 was manufactured in 1994 and is rated at a maximum heat input capacity of 4.5 MMBtu/hr (32.8 gal/hr). Generator 5, located in the stack yard was manufactured in 2002 and is rated at a maximum heat input capacity of 4.2 MMBtu/hr (30.5 gal/hr).

The Fire Pump and emergency generators were previously licensed to fire distillate fuel with a sulfur content of 0.05%; however, based on similar sources and Best Practical Treatment, the sulfur content of the distillate fuel fired in the units shall be limited to 0.0015% sulfur (ultra-low sulfur diesel). Fairchild Semiconductor may fire the distillate fuel currently on-site, but future distillate fuel purchases shall contain a maximum 0.0015% sulfur content.

In order to be consistent with federal regulations, the Fire Pump and emergency generators shall each be limited to 100 hours per year of operation for licensing and fee calculation purposes, with no operating restrictions during emergency situations. This is an update from the previous license which limited each unit to 500 hours/year including emergency situations.

1. BPT Findings

The BPT emission limits for the Fire Pump and generators are based on the following:

- PM/PM₁₀ - 0.12 lb/MMBtu from 06-096 CMR 103 for Generators 4 and 5
0.31 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96 for the
Fire Pump and Generators 1 and 3
- SO₂ - combustion of distillate fuel with a maximum sulfur content
not to exceed 15 ppm (0.0015% sulfur by weight)
- NO_x - 4.41 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
- CO - 0.95 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
- VOC - 0.36 lb/MMBtu from AP-42 Table 3.3-1 dated 10/96
- Opacity - 06-096 CMR 115, BPT

The BPT emission limits for the Fire Pump and generators are the following:

Unit	Pollutant	lb/MMBtu
Generator 4	PM	0.12
Generator 5	PM	0.12

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Fire Pump (0.7 MMBtu/hr)	0.22	0.22	0.04	3.18	0.68	0.26
Generator 1 (2.2 MMBtu/hr)	0.68	0.68	0.11	9.70	2.09	0.79
Generator 3 (2.2 MMBtu/hr)	0.68	0.68	0.11	9.70	2.09	0.79
Generator 4 (4.5 MMBtu/hr)	0.54	0.54	0.23	19.85	4.28	1.62
Generator 5 (4.17 MMBtu/hr)	0.50	0.50	0.21	18.39	3.96	1.50

Visible emissions from each of the distillate fuel-fired Fire Pump and emergency generators shall not exceed 20% opacity on a 6-minute block average, except for no more than two (2) six (6) minute block averages in a 3-hour period. This is a reduction from the 30% opacity limit in the previous license.

2. Periodic Monitoring

Periodic monitoring for the Fire Pump and generators shall include recordkeeping to document the hours of operation both monthly and on a 12 month rolling total basis for each of the units. Documentation shall also be kept on the type of fuel used and the fuel sulfur content.

3. 40 CFR Part 63, Subpart ZZZZ

The federal regulation 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines* is applicable to the Fire Pump and emergency generators listed above. The units are considered existing, emergency stationary reciprocating internal combustion engines at an area HAP source and are not subject to New Source Performance Standards regulations. EPA's August 9, 2010 memo (*Guidance Regarding Definition of Residential, Commercial, and Institutional Emergency Stationary RICE in the NESHAP for Stationary RICE*) specifically does not exempt these units from the federal requirements.

a. Emergency Definition:

Emergency stationary RICE means any stationary reciprocating internal combustion engine that meets all of the following criteria:

- (1) The stationary RICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc. There is no time limit on the use of emergency stationary RICE in emergency situations.
- (2) Paragraph (1) above notwithstanding, the emergency stationary RICE may be operated for any combination of the purposes specified below for a maximum of 100 hours per calendar year:
 - (i) Maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. 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 calendar year.
 - (ii) Emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.
 - (iii) Periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.
- (3) Paragraphs (1) and (2) above notwithstanding, emergency stationary RICE may be operated for up to 50 hours per calendar year in non-emergency situations. These 50 hours are counted as part of the 100 hours per calendar year for maintenance checks and readiness testing, emergency demand response, and periods of voltage deviation or low frequency, as provided in paragraph (2) above.

The 50 hours per calendar year for non-emergency situations cannot be used for peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as

part of a financial arrangement with another entity, except provided in the following paragraphs:

- (i) Prior to May 3, 2014, the 50 hours per year for non-emergency situations can be used for peak shaving or non-emergency demand response to generate income for a facility, or to otherwise supply power as part of a financial arrangement with another entity if the engine is operated as part of a peak shaving (load management program) with the local distribution system operator and the power is provided only to the facility itself or to support the local distribution center.
- (ii) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:
 - (a) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.
 - (b) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
 - (c) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.
 - (d) The power is provided only to the facility itself or to support the local transmission and distribution system.
 - (e) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

The Fire Pump and Generators 1, 3, 4, and 5 shall be limited to the usage outlined in §63.6640(f) and therefore may be classified as existing emergency stationary RICE as defined in 40 CFR Part 63, Subpart ZZZZ. Failure to comply with all of the requirements listed in §63.6640(f) may cause these engines to not be considered emergency engines and therefore subject to all the requirements for non-emergency engines.

b. 40 CFR Part 63, Subpart ZZZZ Requirements:

(1) Operation and Maintenance Requirements

	Operating Limitations* (40 CFR §63.6603(a) and Table 2(d))
Compression ignition (distillate fuel) units: Fire Pump and Generators 1, 3, 4, and 5	<ul style="list-style-type: none"> - Change oil and filter every 500 hours of operation or annually, whichever comes first; - Inspect the air cleaner every 1000 hours of operation or annually, whichever comes first, and replace as necessary; and - Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

The generators shall be operated and maintained according to the manufacturer's emission-related written instructions or facility shall develop a 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. [40 CFR §63.6625(e)]

(2) Optional Oil Analysis Program

Fairchild Semiconductor has the option of utilizing an oil analysis program which complies with the requirements of §63.6625(i) in order to extend the specified oil change requirement. If this option is used, Fairchild Semiconductor 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. [40 CFR §63.6625(i)]

(3) Non-Resettable Hour Meter Requirement

A non-resettable hour meter shall be installed and operated on each generator. [40 CFR §63.6625(f)]

(4) Startup Idle and Startup Time Minimization Requirements

During periods of startup the facility must minimize the engine's time spent at idle 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 non-startup emission limitations apply. [40 CFR §63.6625(h) & 40 CFR Part 63, Subpart ZZZZ Table 2d]

(5) Annual Time Limit for Maintenance and Testing

The generator(s) shall each be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include

peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity unless the conditions in §63.6640(f)(4)(ii) are met). [40 CFR §63.6640(f)]

(6) Recordkeeping

Fairchild Semiconductor shall keep records that include maintenance conducted on the generators and the hours of operation of each engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the generators are operated during a period of demand response or deviation from standard voltage or frequency, or to supply power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), Fairchild Semiconductor shall keep records of the notification of the emergency situation, and the date, start time, and end time of generator operation for these purposes. [40 CFR §63.6655(e) and (f)]

(7) Requirements for Demand Response Availability Over 15 Hours Per Year (and greater than 100 brake hp: for Generators 1, 3, 4, and 5, if applicable)

If Fairchild Semiconductor operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), beginning January 1, 2015, the fuel fired in the generator(s) shall not exceed 15 ppm sulfur (0.0015%). Any existing fuel purchased (or otherwise obtained) prior to January 1, 2015, may be used until depleted. [40 CFR §63.6604(b)]

If Fairchild Semiconductor operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), the facility shall submit an annual report containing the information in §63.6650(h)(1)(i) through (ix). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

[40 CFR §63.6650(h)]

E. Particulate Matter Process Emissions

Particulate matter is emitted by processes at Fairchild Semiconductor. Fabric filters are used to control these particulate matter emissions.

1. BPT

BPT for vents emitting particulate matter, including the current exhaust fan EF 4-4 for arsenic trioxide, shall be the use of fabric filters. The previous license listed additional particulate matter vents in Building 12, but those operations no longer occur and the equipment has been removed.

Visible emissions from each of the fabric filters shall not exceed 10% opacity on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a one (1) hour period. Fairchild Semiconductor shall take corrective action if visible emissions from the fabric filter exceeds 5% opacity.

2. Periodic Monitoring

Periodic monitoring for the fabric filters shall include a maintenance log containing the date and description of any maintenance, routine or otherwise, performed on the filters.

F. VOC Processes and Abatement Unit

Various operations in the wafer fabrication process at Fairchild Semiconductor emit VOCs. Due to product specifications and manufacturing needs, the amount of VOCs emitted from a specific vent can vary. VOCs from most of the VOC emitting tools are collected and incinerated in the VOC abatement unit as required by this license. The remaining balance is vented to the atmosphere.

The VOC abatement unit, installed in 1996, consists of a zeolite concentrator followed by an incinerator unit with a 4.0 MMBtu/hr natural gas burner and propane hookup. VOC emissions are ducted from the VOC emitting tools to the VOC abatement unit. The unit exhausts through a 60 foot stack.

1. BPT

BPT for Fairchild Semiconductor's solvent processes is a facility annual VOC limit of 25 tons/year from its process equipment on a 12 month rolling total basis and the use of a VOC abatement unit equipped with rotor rotation and air flow alarms, along with a continuous temperature monitor.

Fairchild Semiconductor shall operate the VOC abatement unit at all times the facility is operating from April 1 - September 30 and may need to operate the unit during October 1 - March 31, as necessary, to meet the facility-wide VOC limit. The requirement to operate the unit from April 1 - September 30 includes the official ozone season of May 1 through September 30, while taking into account the month of April which can also have high ozone levels. The unit shall have a 97% uptime (including malfunctions and maintenance).

The unit shall be maintained and operated to meet a minimum treatment efficiency of 90% removal or demonstrate a 20 ppm output at all times the unit is operating. The removal efficiency shall be calculated as follows:

$$\frac{(VOC \text{ at inlet of abatement unit}) - (VOC \text{ at outlet of abatement unit})}{(VOCs \text{ at inlet of abatement unit})} \times 100$$

The accuracy of the testing equipment can make it difficult to record accurate measurements when the incinerator input is less than 200 ppm VOC and the corresponding output is less than 20 ppm, therefore Fairchild Semiconductor may use either the 90% removal efficiency or 20 ppm output concentration to determine compliance.

The unit is designed to operate within a temperature range of 1350°F-1500°F. When the monitored temperature is not within the normal range, the unit shuts down. The records of unit shutdowns and alarms shall be incorporated into the emissions calculations since the VOCs vent to the atmosphere when the unit is not operating.

The Facility Management System (FMS) shall monitor the tool exhaust fans.

Visible emissions from the VOC abatement unit shall not exceed 10% opacity on a six-minute average basis, except for no more than one (1) six (6) minute average in any one (1) hour period.

Visible emissions from VOCs venting directly to the atmosphere shall not exceed 10% opacity on a six (6) minute average basis, except for no more than one (1) six (6) minute block average in a one (1) hour period.

2. Calculations

In order to demonstrate compliance with the annual VOC limit, Fairchild Semiconductor shall use the following to calculate emissions: purchase records, the distribution system which associates the solvents with either an uncontrolled process area or a controlled process area, and the VOC abatement unit control efficiency. When the VOC abatement unit is not operating, those processes normally controlled shall be considered uncontrolled. The spent solvent records shall include the mass and volume of spent solvents shipped off-site, as well as test results of the VOC contents of the mixed solvents.

The following equations shall be used to calculate process VOC emissions:

- (1) (VOC Purchased and Used in Uncontrolled Process Area) – (Spent liquid VOC Collected from Uncontrolled Process Area) = Uncontrolled VOC Emitted
- (2) (VOC Purchased and Used in Controlled Process Area) – (Spent liquid VOC Collected from Controlled Process Area) = VOC Conveyed to the Control Device
- (3) (VOC Conveyed to Control Device)*(1-Control Efficiency) = VOC Emitted from the Control Device
- (4) (Uncontrolled VOC Emitted) + (VOC Emitted from the Control Device) = Total VOC Emissions

A simplified example using these equations to calculate emissions for a 12 month period follows:

VOC purchased and used in uncontrolled process area	90,000 lb	
Spent liquid VOC collected from uncontrolled process area	<u>-53,000 lb</u>	
Uncontrolled VOC emitted from the facility	37,000 lb	(1)
VOC purchased and used in controlled process area	68,000 lb	
Spent liquid VOC collected from controlled process area	<u>-24,425 lb</u>	
VOC conveyed to control device	43,575 lb	(2)
VOC conveyed to control device	43,575 lb	(2)
Control efficiency of abatement unit	93%	
VOC emitted from the control device	3,050 lb	(3) = (43,575) * (1 - .93)
Uncontrolled VOC emitted from the facility	<u>+37,000 lb</u>	(1)
Total actual VOC emissions	40,050 lb	(4) = (3) + (1)

For VOCs from insignificant activities, Fairchild Semiconductor shall maintain in its files an estimate of the VOCs emitted annually from such activities, to the extent that the VOC emissions are not included in the 12 month rolling average recordkeeping program. The estimate shall be updated annually if process or raw material changes have occurred that would affect the previous estimate.

3. Periodic Monitoring

Fairchild Semiconductor shall perform efficiency testing on the VOC abatement unit in 2014 and every other year thereafter (by December 1 of each year), testing the concentrator inlet and oxidizer outlet. The efficiency testing method may measure VOCs or total hydrocarbons.

Fairchild Semiconductor shall keep records of events when the VOC abatement unit shuts down and events when the alarms are activated. Alarmed items include the status of the concentrator's rotor and the status of the fans located in the process vents. The records shall include the dates and times the unit is not operating or controlling emissions (from when to when), and these records shall be used to determine compliance with the 97% uptime requirement, including malfunctions and maintenance.

Fairchild Semiconductor shall maintain VOC emission records in accordance with the equations above, on a monthly and 12 month rolling total basis.

4. Parameter Monitoring

Fairchild Semiconductor shall operate a combustion temperature monitor on the VOC abatement unit. The parameter monitor shall record accurate and reliable data 98% of the time.

G. Acid and Alkaline Emission Sources

Fairchild Semiconductor has several acid and alkaline emission points which are controlled by alkaline and acidic wet scrubbers. In May and June of 2010, Fairchild Semiconductor performed efficiency testing on the scrubbers as required by air emission license A-370-71-V-R (December 30, 2009), and conducted a study of the scrubbers to determine appropriate operating conditions and recordkeeping for optimal scrubber control. The study, submitted in December of 2010, confirmed monitoring the operational parameter of pH was appropriate for demonstrating the proper operation of the wet scrubbers. The facility's goal of achieving either >90% control efficiency or < 1 ppm emission concentration for HCl, HF, and NH₃, as applicable for each scrubber, was met utilizing the pH set points previously established. The set points were a pH of above 5 for the acid vapor scrubber media and a pH of at or below 5 for the alkaline vapor scrubber media. The exception was the alkaline scrubber 12-329, whose process has since been removed (the recommendation from the study for that particular scrubber was to maintain pH at or below 3).

1. BPT

The pH of the scrubbing media shall be monitored and adjusted as appropriate, at the following levels:

- the pH of the acid vapor scrubbing media shall be maintained above 5; and
- the pH of the alkaline vapor scrubbing media shall be maintained at or below 5.

The wet scrubbers shall each be operated at a minimum of 97% of the time the wafer process is operating. This requirement was established in air emission license A-370-71-T-M (March 4, 2004) in order to allow for flexibility to conduct routine maintenance and correct pH imbalances.

Opacity from each scrubber stack shall not exceed 15% opacity on a six (6) minute average basis, except for no more than one (1) six (6) minute average in any one (1) hour period.

2. Periodic Monitoring

The pH of the acid and alkali scrubbers shall be checked and recorded once per shift.

A maintenance log shall be kept for each scrubber. The log shall contain dates and reasons for all emission upsets as well as descriptions and dates of any maintenance, routine or otherwise, performed on the scrubbers.

An operational log shall be kept for each scrubber. The log shall contain dates and reasons that the scrubber is not operating (including periods of pH deviation). Fairchild Semiconductor shall also record the operating time of the wafer process.

H. Emergency Release Scrubber System

The emergency release scrubber is designated emission point EF 6-2 and it consists of a dual scrubber followed by a mist eliminator. The scrubber system is connected to rupture disks on storage containers which is used to store large quantities of TCS (trichlorosylene) and HCl gas. The scrubber fans and controls run continuously and exhaust air from various enclosures which contain HCl/TCS piping. In the event of an accidental release, determined by a number of toxic gas monitoring points, water will be turned on to the scrubber and the toxic gasses will be abated to a safe concentration.

1. BPT

BPT for control of the bulk gas delivery system is the use of the emergency release scrubber.

2. Periodic Monitoring

A maintenance and operational log shall be kept for the emergency release scrubber. The log shall contain dates and reasons for all emission upsets as well as descriptions and dates of any maintenance, routine or otherwise, performed on the scrubber. The

log shall also contain dates and reasons for the activation of the Emergency Release Scrubber.

I. HAP (Hazardous Air Pollutant) Processes

Several of the VOC streams emitted by Fairchild Semiconductor contain HAPs (substances listed in Section 112(b) of the Clean Air Act).

1. BPT

BPT for HAP emissions is a facility-wide emissions limit of 9.9 tons/year of any single HAP and less than 24.9 tons/year total of all HAPs. These limits also keep the facility under major source thresholds for HAP.

2. Periodic Monitoring

Fairchild Semiconductor shall maintain HAP emission records using a similar calculation method as used for VOC emissions, on a monthly and 12 month rolling total basis. HAP emissions calculations shall be based on purchase records, SDS (safety data sheets) records for the various materials used in the facility, and whether the HAP emission points are controlled.

3. 40 CFR Part 63, Subpart WWWW

Fairchild Semiconductor submitted a notification of compliance status for National Emission Standards for Hazardous Air Pollutants: *Area Source Standards for Plating and Polishing Operations* 40 CFR Part 63, Subpart WWWW on June 28, 2010 for the electroplating (noncyanide) operation. Compliance includes best management practices, including but not limited to: minimizing bath agitation when removing any parts processed in the tank; maximizing the draining of bath solution back into the tank; optimizing the design of barrels, racks, and parts to minimize drag out of bath solution; utilizing tank covers whenever practicable; minimizing or reducing heating of process tanks; performing regular repair maintenance and preventative maintenance of associated equipment; minimizing bath contamination; maintaining quality control of chemicals and bath ingredient concentration; performing general good housekeeping; minimizing spills, and performing regular inspections.

J. Parts Washer

Fairchild Semiconductor operates two 30 gallon parts washers, Degreaser 1 utilizes Simple Green solvent with 0% VOC and Degreaser 2 utilizes Tekusolv II Red solvent with 100% VOC. If solvents containing greater than 5% VOCs by weight are used, the parts washer is subject to *Solvent Cleaners*, 06-096 CMR 130 (as amended) and records shall be kept documenting compliance. Currently, Degreaser 2 is subject to 06-096 CMR 130.

K. Fugitive Emissions

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed an opacity of 20%, except for no more than five (5) minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual fifteen (15)-second opacity observations which exceed 20% in any one (1) hour.

L. General Process Emissions

Visible emissions from any general process source not specifically listed in the license shall not exceed an opacity of 20% on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 1-hour period.

M. Annual Emissions

1. Total Annual Emissions

To maximize operational flexibility and Fairchild Semiconductor's ability to respond to changes in fuel market conditions and to ensure that the South Portland plant remains below the Part 70 major source threshold, Fairchild Semiconductor shall be limited facility-wide to 99.9 TPY of PM, SO₂, NO_x and CO using the fuel equations below. Based on short-term emission limits, if SO₂, NO_x and CO emissions are under 99.9 tons/year, PM is also under 99.9 tons/year. Fairchild Semiconductor shall use distillate fuel meeting ASTM D396 for #2 fuel oil (current max. sulfur content of 0.5%) or natural gas in its boilers; and distillate fuel with a maximum sulfur content of 0.0015% by weight in its emergency generators and Fire Pump. VOCs shall be limited to 25 tons/year from process sources and 15 tons/year from fuel burning sources. Based on short term emission limits, if SO₂, NO_x and CO emissions are under 99.9 tons/year, VOC from fuel burning sources will also be under 15 tons/year.

The following equations shall be used to determine the 12-month rolling totals:

SO₂

$$\frac{\text{tons } SO_2}{\text{year}} = \frac{\text{tons gen } SO_2}{\text{year}} + \frac{\left(\frac{\text{lb } S}{\text{MMBtu distillate fuel}} \right) \left(\frac{2 \text{ lb } SO_2}{1 \text{ lb } S} \right) \left(\frac{\text{MMBtu}}{\text{gal distillate}} \right) \left(\frac{\text{gal distillate}}{\text{year}} \right) + \left(\frac{\text{lb } SO_2}{\text{scf NG}} \right) \left(\frac{\text{scf NG}}{\text{year}} \right)}{2000 \frac{\text{lb}}{\text{ton}}}$$

Which simplifies to:

$$\frac{\text{tons } SO_2}{\text{year}} = AD + \frac{[(0.141y)(s_2) + (0.0000006z)]}{2000} \leq 99.9 \text{ tons / year}$$

where:

- AD= annual quantity (tons) of SO₂ from the operation of all engines = sum of [(total hours of operation)(lb/hr limit)]/2000 for each unit;
- y = annual quantity of distillate fuel combusted (gallons) in boilers;
- s₂ = average sulfur content by weight of distillate fuel (percent);
- z = annual quantity of natural gas combusted (standard cubic feet) in boilers.

NO_x

$$\frac{\text{tons } NO_x}{\text{year}} = \frac{\text{tons gen } NO_x}{\text{year}} + \frac{\left(\frac{0.3 \text{ lb } NO_x}{\text{MMBtu distillate}} \right) \left(\frac{\text{MMBtu distillate}}{\text{gal distillate}} \right) \left(\frac{\text{gal distillate}}{\text{year}} \right) + \left(\frac{100 \text{ lb } NO_x}{\text{MMscf NG}} \right) \left(\frac{\text{MMscf NG}}{\text{scf NG}} \right) \left(\frac{\text{scf NG}}{\text{year}} \right)}{2000 \frac{\text{lb}}{\text{ton}}}$$

Which simplifies to:

$$\frac{\text{tons } NO_x}{\text{year}} = AD + \frac{[(0.042y) + (0.0001z)]}{2000} \leq 99.9 \text{ tons / year}$$

where:

- AD = annual quantity (tons) of NO_x from the operation of all engines = sum of [(total hours of operation)(lb/hr limit)]/2000 for each unit;
- y = annual quantity of distillate fuel combusted (gallons) in boilers;
- z = annual quantity of natural gas combusted (standard cubic feet) in boilers.

Note the previous license had a term of 0.0000721z in the NO_x equation which has been corrected to 0.0001z in this license.

CO

$$\frac{\text{tons CO}}{\text{year}} = \frac{\text{tons gen CO}}{\text{year}} + \frac{\left(\frac{\text{lb CO}}{\text{gal distillate}} \right) \left(\frac{\text{gal distillate}}{\text{year}} \right) + \left(\frac{\text{lb CO}}{\text{scf NG}} \right) \left(\frac{\text{scf NG}}{\text{year}} \right)}{2000 \frac{\text{lb}}{\text{ton}}}$$

Which simplifies to:

$$\frac{\text{ton CO}}{\text{year}} = AD + \frac{[(0.005y) + (0.000084z)]}{2000} \leq 99.9 \text{ tons / year}$$

where:

- AD = annual quantity (tons) of CO from the operation of all engines = sum of [(total hours of operation)(lb/hr limit)]/2000 for each unit;
y = annual quantity of distillate fuel combusted (gallons) in boilers;
z = annual quantity of natural gas combusted (standard cubic feet) in boilers.

The following shall not be exceeded on a 12-month rolling total basis:

Total Allowable Annual Licensed Emissions for the Facility
(used to calculate the annual license fee)

Pollutant	Tons/Year
PM	99.9
PM ₁₀	99.9
SO ₂	99.9
NO _x	99.9
CO	99.9
VOC	25 process equipment; 15 fuel burning

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

2. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011, through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans*, 40 CFR Part 52, Subpart A, §52.21 Prevention of Significant Deterioration of Air Quality rule. Greenhouse gases, as defined in 06-096 CMR 100 (as amended), are the aggregate group of the following gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO₂e).

Fairchild Semiconductor previously requested a license limit to reduce its greenhouse gases potential-to-emit to ensure the facility would not be in the major source Title V category. Amendment A-370-71-X-M (July 19, 2011) and a revised amendment A-370-71-Y-M (June 26, 2012) established a 74,895 short tons of CO₂e per year limit total from all stationary fuel combustion sources and the semiconductor manufacturing processes at the facility, since there was a chance that the major source threshold of GHG could be either 100,000 or 75,000 short tons of CO₂e per year. In a June 23, 2014 decision, the United States Supreme Court vacated the requirement for

sources to obtain a Title V operating permit solely due to GHG emissions. Therefore, Fairchild Semiconductor is not required to limit GHG emissions to remain a minor source. The GHG facility-wide limit shall be removed from the license.

III. AMBIENT AIR QUALITY ANALYSIS

Fairchild Semiconductor previously submitted an ambient air quality analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards. The ambient modeling was performed as part of amendment A-370-71-B-T/R (June 3, 1997). An additional ambient air quality analysis is not required for this renewal.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-370-71-Z-R/A subject to the following conditions.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

STANDARD CONDITIONS

- (1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S.A. §347-C).
- (2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 CMR 115]
- (3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend

this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 CMR 115]

- (4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 CMR 115]
- (5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353-A. [06-096 CMR 115]
- (6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 CMR 115]
- (7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 CMR 115]
- (8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 CMR 115]
- (9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [06-096 CMR 115]
- (10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [06-096 CMR 115]
- (11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:
 - A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
 1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
 2. pursuant to any other requirement of this license to perform stack testing.

- B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and
 - C. submit a written report to the Department within thirty (30) days from date of test completion.
[06-096 CMR 115]
- (12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:
- A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and
 - B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and
 - C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.
[06-096 CMR 115]
- (13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [06-096 CMR 115]
- (14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 CMR 115]
- (15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the

Department may reasonably require to determine the licensee's compliance status. [06-096 CMR 115]

SPECIFIC CONDITIONS

(16) Existing Boilers 1 and 2 and Replacement Boilers 3 and 4

A. Fuel

1. Boilers 1 and 2 may fire either natural gas or distillate fuel. [06-096 CMR 115, BPT]
2. Replacement Boilers 3 and 4 may fire natural gas. [06-096 CMR 115, BACT]
3. Prior to July 1, 2016 or the date specified in 38 MRSA §603-A(2)(A)(3), the distillate fuel fired in the boiler shall be ASTM D396 compliant #2 fuel oil (max. sulfur content of 0.5% by weight). [06-096 CMR 115, BPT]
4. Beginning July 1, 2016 or on the date specified in 38 MRSA §603-A(2)(A)(3), the facility shall fire distillate fuel with a maximum sulfur content limit of 0.005% by weight (50 ppm). [38 MRSA §603-A(2)(A)(3)]
5. Beginning January 1, 2018 or on the date specified in 38 MRSA §603-A(2)(A)(3), the facility shall fire distillate fuel with a maximum sulfur content limit of 0.0015% by weight (15 ppm). [38 MRSA §603-A(2)(A)(3)]
6. Compliance shall be demonstrated by fuel records from the supplier showing the quantity, type, and the percent sulfur of the fuel delivered (if applicable). Records of annual fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BPT]

B. Emissions shall not exceed the following [06-096 CMR 115, BPT/BACT]:

<u>Unit</u>	<u>Fuel</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>
Boiler 1	Distillate fuel	PM	0.1
	Natural gas		0.01
Boiler 2	Distillate fuel	PM	0.1
	Natural gas		0.01
Boiler 3	Natural gas	PM	0.01
Boiler 4	Natural gas	PM	0.01

C. Emissions shall not exceed the following [06-096 CMR 115, BPT/BACT]:

Unit	Fuel	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler 1 (12.53 MMBtu/hr)	Distillate fuel	1.25	1.25	6.31	3.76	0.45	0.02
	Natural gas	0.13	0.13	0.01	1.22	1.02	0.07
Boiler 2 (20.9 MMBtu/hr)	Distillate fuel	2.09	2.09	10.42	6.21	0.74	0.03
	Natural gas	0.21	0.21	0.01	2.01	1.69	0.11
Boiler 3 (14.0 MMBtu/hr)	Natural gas	0.14	0.14	0.01	1.36	1.14	0.07
Boiler 4 (14.0 MMBtu/hr)	Natural gas	0.14	0.14	0.01	1.36	1.14	0.07

- D. Visible emissions from the boilers' common stack (stack 2) shall not exceed 20% opacity on a 6 minute block average, except for no more than three (3) six (6) minute block averages in a 3 hour period. [06-096 CMR 115, BACT]
- E. 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*

Fairchild Semiconductor shall comply with all requirements of 40 CFR Part 60, Subpart Dc applicable to replacement Boilers 3 and 4 including, but not limited to, the following:

1. Fairchild Semiconductor shall submit notification to EPA and the Department of the date of construction, anticipated start-up, and actual start-up. This notification shall include the design heat input capacity of the boiler and the type of fuel to be combusted. [40 CFR §60.48c(a)]
2. Fairchild Semiconductor shall record and maintain records of the amounts of fuel combusted monthly. [40 CFR §60.48c(g)]
3. Fairchild Semiconductor shall submit to EPA and the Department semi-annual reports. These reports shall include the calendar dates covered in the reporting period and records of fuel supplier certifications. The semi-annual reports are due within 30 days of the end of each 6-month period.
4. The following address for EPA shall be used for any reports or notifications required to be copied to them:

Compliance Clerk
 USEPA Region 1
 5 Post Office Sq. Suite 100
 Boston, MA 02109-3912

- F. Boiler MACT (40 CFR Part 63, Subpart JJJJJ) Requirements for Boilers 1 and 2 [incorporated under 06-096 CMR 115, BPT]

1. An Initial Notification submittal to EPA was due no later than January 20, 2014. [40 CFR Part 63.11225(a)(2)]
2. The facility was required to have implemented a boiler tune-up program to include the initial tune-up of applicable boilers no later than March 21, 2014. [40 CFR Part 63.11223]
 - (a) Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. See chart below:

Boiler Category	Tune-Up Frequency
New or Existing Oil, Biomass and Coal fired boilers that are not designated as "Boilers with less frequent tune up requirements" listed below	Every 2 years
<i>New and Existing Oil, Biomass, and Coal fired Boilers with less frequent tune up requirements</i>	
Seasonal (see definition §63.11237)	Every 5 years
Limited use (see definition §63.11237)	Every 5 years
With a heat input capacity of <5MMBtu/hr	Every 5 years
Boiler with oxygen trim system which maintains an optimum air-to-fuel ratio that would otherwise be subject to a biennial tune up	Every 5 years

[40 CFR Part 63.11223(a) and Table 2]

- (b) The tune-up compliance report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured at high fire or typical operating load, before and after the boiler tune-up, a description of any corrective actions taken as part of the tune-up of the boiler, and the types and amounts of fuels used over the 12 months prior to the tune-up of the boiler. [40 CFR Part 63.11223(b)(6)] The compliance report shall also include the company name and address; a compliance statement signed by a responsible official certifying truth, accuracy, and completeness; and a description of any deviations and corrective actions. [40 CFR Part 63.11225(b)]
3. The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:
 - (a) As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled

shutdown is permitted; not to exceed 36 months from the previous inspection for boilers greater than 5 MMBtu/hr or 72 months from the previous inspection for oil fired boilers less than 5 MMBtu/hr, boilers with oxygen trim systems, seasonal boilers, and limited use boilers. [40 CFR Part 63.11223(b)(1)]

- (b) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 CFR Part 63.11223(b)(2)]
- (c) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted; not to exceed 36 months from the previous inspection for boilers greater than 5 MMBtu/hr or 72 months from the previous inspection for oil fired boilers less than 5 MMBtu/hr, boilers with oxygen trim systems, seasonal boilers, and limited use boilers. [40 CFR Part 63.11223(b)(3)]
- (d) Optimize total emissions of CO, consistent with manufacturer's specifications. [40 CFR Part 63.11223(b)(4)]
- (e) Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 CFR Part 63.11223(b)(5)]
- (f) If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 CFR Part 63.11223(b)(7)]

4. After conducting the initial boiler tune-up, a Notification of Compliance Status was required to be submitted to EPA no later than July 19, 2014. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(b)]

5. Energy Assessment

- (a) A one-time energy assessment was required to be performed by a qualified energy assessor on the applicable boilers no later than March 21, 2014. [40 CFR Part 63.11196(a)(3)]
- (b) The energy assessment was required to include a visual inspection of the boiler system; an evaluation of operating characteristics of the affected boiler systems, specifications of energy use systems, operating and maintenance procedures, and unusual operating constraints; an inventory of major energy use systems consuming energy from affected boiler(s) and which are under control of the boiler owner or operator; a review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage; a list of major energy conservation measures that are within the facility's control; a list of the energy savings potential of the energy conservation measures identified; and a comprehensive report detailing the

ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments. [40 CFR 63, Table 2(4)]

(c) A Notification of Compliance Status or was required to be submitted to EPA no later than July 19, 2014. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(c)]

6. Records shall be maintained consistent with the requirements of 40 CFR Part 63 Subpart JJJJJ including the following [40 CFR Part 63.11225(c)]: copies of notifications and reports with supporting compliance documentation; identification of each boiler, the date of tune-up, procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned; documentation of fuel type(s) used monthly by each boiler; the occurrence and duration of each malfunction of the boiler; and actions taken during periods of malfunction to minimize emissions and actions taken to restore the malfunctioning boiler to its usual manner of operation. Records shall be in a form suitable and readily available for expeditious review.

(17) Emergency Generators (includes the Fire Pump)

- A. Each of the emergency generators shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 CMR 115]
- B. The fuel sulfur content for emergency generators shall be limited to 0.0015% sulfur by weight. Compliance shall be demonstrated by fuel records from the supplier documenting the type of fuel delivered and the sulfur content of the fuel. Fairchild Semiconductor may deplete the diesel fuel with 0.05% sulfur by weight currently on-site, but future purchases shall be 0.0015% sulfur fuel. [06-096 CMR 115, BPT]
- C. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Generator 4	PM	0.12	06-096 CMR 103(2)(B)(1)(a)
Generator 5	PM	0.12	06-096 CMR 103(2)(B)(1)(a)

- D. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Fire Pump (0.7 MMBtu/hr)	0.22	0.22	0.04	3.18	0.68	0.26
Generator 1 (2.2 MMBtu/hr)	0.68	0.68	0.11	9.70	2.09	0.79
Generator 3 (2.2 MMBtu/hr)	0.68	0.68	0.11	9.70	2.09	0.79
Generator 4 (4.5 MMBtu/hr)	0.54	0.54	0.23	19.85	4.28	1.62
Generator 5 (4.17 MMBtu/hr)	0.50	0.50	0.21	18.39	3.96	1.50

E. Visible Emissions

Visible emissions from each of the distillate fuel-fired emergency generators shall not exceed 20% opacity on a 6-minute block average, except for no more than two (2) six (6) minute block averages in a 3-hour period. [06-096 CMR 115, BPT]

F. The emergency generators shall meet the applicable requirements of 40 CFR Part 63, Subpart ZZZZ, including the following:

1. Fairchild Semiconductor shall meet the following operational limitations for each of the compression ignition emergency generators:

- a. Change the oil and filter annually,
- b. Inspect the air cleaner annually and replace as necessary, and
- c. Inspect the hoses and belts annually and replace as necessary.

A log shall be maintained documenting compliance with the operational limitations.

[40 CFR §63.6603(a) and Table 2(d); and 06-096 CMR 115]

2. Oil Analysis Program Option

Fairchild Semiconductor has the option of utilizing an oil analysis program which complies with the requirements of §63.6625(i) in order to extend the specified oil change requirement. If this option is used, Fairchild Semiconductor 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. [40 CFR §63.6625(i)]

3. Non-Resettable Hour Meter

A non-resettable hour meter shall be installed and operated on each generator. [40 CFR §63.6625(f)]

4. Maintenance, Testing, and Non-Emergency Operating Situations

- a. The generators shall each be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise to supply power as part of a financial arrangement with another entity unless the conditions in §63.6640(f)(4)(ii) are met). These limits are based on a calendar year. Compliance shall be demonstrated by a written log of all generator operating hours. [40 CFR §63.6640(f) and 06-096 CMR 115]
- b. Fairchild Conductor shall keep records that include maintenance conducted on the generators and the hours of operation of each engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the generators are operated during a period of demand response or deviation from standard voltage or frequency, or to supply power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), the facility shall keep records of the notification of the emergency situation, and the date, start time, and end time of generator operation for these purposes. [40 CFR §63.6655(e) and (f)]

5. Operation and Maintenance

The generators shall be operated and maintained according to the manufacturer's emission-related written instructions or Fairchild Semiconductor shall develop a 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. [40 CFR §63.6625(e)]

6. Startup Idle and Startup Time Minimization

During periods of startup the facility must minimize the engine's time spent at idle 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 non-startup emission limitations apply. [40 CFR §63.6625(h) & 40 CFR Part 63, Subpart ZZZZ Table 2d]

7. Requirements For Demand Response Availability Over 15 Hours Per Year (and greater than 100 brake hp: for Generators 1, 3, 4, and 5, if applicable)

- a. If Fairchild Semiconductor operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response

program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), beginning January 1, 2015, the fuel fired in the generators shall not exceed 15 ppm sulfur (0.0015%). Any existing fuel purchased (or otherwise obtained) prior to January 1, 2015, may be used until depleted. [40 CFR §63.6604(b)]

- b. If Fairchild Semiconductor operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §63.6640(f)(4)(ii), the facility shall submit an annual report containing the information in §63.6650(h)(1)(i) through (ix). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109-3912

[40 CFR §63.6650(h)]

(18) Particulate Matter Emission Processes

- A. Vents emitting particulate matter shall be controlled by the use of fabric filters. [06-096 CMR 115, BPT]
- B. A maintenance log shall be kept for each of the fabric filters. The logs shall contain dates and reasons for all emission upsets, as well as descriptions of any maintenance (routine or otherwise) or corrective actions performed on the filters. [06-096 CMR 115, BPT]
- C. Visible emissions from each for the fabric filters shall not exceed 10% opacity on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a one (1) hour period. Fairchild Semiconductor shall take corrective action if visible emissions from the fabric filter exceeds 5% opacity. [06-096 CMR 101]

(19) **VOC Processes and Abatement Unit**

A. Facility-wide process VOC emissions shall be limited to 25 tons/year, based on a 12 month rolling total. [06-096 CMR 115, BPT]

B. VOC Abatement Unit Operations

1. Fairchild Semiconductor shall operate the VOC abatement unit on the main VOC process vents in Building 17 and the low volume, high concentration solvent vents in Buildings 1, 2, 5, and 12 at all times the wafer process is in operation during April 1 - September 30 with a 97% uptime requirement on the VOC abatement unit. For compliance purposes, the 3% downtime (97% uptime) calculation shall include any downtime of the abatement unit, regardless of cause (malfunctions, maintenance, etc). The unit may need to be operated during October 1-March 31 as necessary to meet the facility-wide VOC limit. [06-096 CMR 115, BPT and A-370-71-W-A, April 13, 2009]
2. Fairchild Semiconductor shall keep records of events when the VOC abatement unit shuts down, including automatic shutoff when out of the temperature range of 1350°F-1500°F, and activated alarm events. The records shall include the dates and timeframes the unit is not operating or controlling emissions, and these records shall be used to determine compliance with the 97% uptime requirement, including malfunctions and maintenance. [06-096 CMR 115, BPT]
3. Fairchild Semiconductor shall maintain and operate the abatement unit to meet a minimum treatment efficiency of 90% removal or a stack concentration of less than 20 ppm output when the unit is operating. The removal efficiency shall be calculated as follows:

$$\frac{(VOC \text{ at inlet of abatement unit}) - (VOC \text{ at outlet of abatement unit}) \times 100}{(VOCs \text{ at inlet of abatement unit})}$$

[06-096 CMR 115, BPT]

4. Fairchild Semiconductor shall keep a maintenance log for the VOC abatement unit, recording the date, time, and reasons for all emissions upsets as well as all routine maintenance procedures. [06-096 CMR 115, BPT]
5. Monitors
 - a. The following shall be monitored on the VOC abatement unit:
 - i. combustion temperature (parameter monitor),
 - ii. alarms that indicate the status of the concentrator's rotor, and
 - iii. the status of the fans located in the process vents.

- b. The combustion temperature parameter monitor must record accurate and reliable data. If the parameter monitor is recording accurate and reliable data less than 98% of the VOC abatement unit operating time during April 1 - September 30, the Department may initiate enforcement action and may include in that enforcement action any periods of time that the parameter monitor was not recording accurate and reliable data during that six month period unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions.

For the purposes of this condition, the parameter monitor shall be considered to be operating if the monitor records two data points in one hour. Fairchild Semiconductor shall keep records of all periods of time that the VOC abatement unit is operating and the parameter monitor does not record at least two data points in one hour. This data shall be used to demonstrate compliance with the requirement that the parameter monitor record 98% of the time the source is operating within the April 1 – September 30 six month period.

[06-096 CMR 115, BPT]

6. Visible emissions from the VOC abatement unit shall not exceed 10% opacity on a six-minute average basis, except for no more than one (1) six (6) minute average in any one (1) hour period. [06-096 CMR 115, BPT]
 7. Testing shall be performed in 2014 and every other year thereafter (by December 1 of each year) on the inlet and outlet streams of the VOC abatement unit. Testing shall be conducted in accordance with the appropriate EPA method for VOCs or the appropriate EPA method for total hydrocarbons. [06-096 CMR 115, BPT and A-370-71-W-A, April 13, 2009]
- C. Visible emissions from vents emitting VOCs directly to the atmosphere shall not exceed 10% opacity on a six (6) minute average, except for no more than one (1) six (6) minute block average in a one (1) hour period. [06-096 CMR 115, BPT]
- D. Total VOC emissions from the processes at Fairchild Semiconductor shall be calculated on a 12 month rolling total basis, updated monthly, using the following equations:
1. $(\text{VOC Purchased and Used in Uncontrolled Process Area}) - (\text{Spent liquid VOC Collected from Uncontrolled Process Area}) = \text{Uncontrolled VOC Emitted}$
 2. $(\text{VOC Purchased and Used in Controlled Process Area}) - (\text{Spent liquid VOC Collected from Controlled Process Area}) = \text{VOC Conveyed to the Control Device}$

3. $(\text{VOC Conveyed to Control Device}) * (1 - \text{Control Efficiency}) = \text{VOC Emitted from the Control Device}$
4. $(\text{Uncontrolled VOC Emitted}) + (\text{VOC Emitted from the Control Device}) = \text{Total VOC Emissions}$

When the wafer process is operating and the VOC abatement unit is not operating, the emissions from the normally controlled areas shall be considered uncontrolled for the purposes of VOC emission calculations.

[06-096 CMR 115, BPT]

- E. For VOCs from insignificant activities, Fairchild Semiconductor shall maintain in its files an estimate of the VOCs emitted annually from such activities, to the extent that the VOC emissions are not included in the 12 month rolling average recordkeeping program. The estimate shall be updated annually if process or raw material changes have occurred that would affect the previous estimate. [06-096 CMR 115, BPT]

(20) **Acid and Alkaline Emission Sources**

- A. Fairchild Semiconductor shall operate wet scrubbers to control emissions from the acid and alkaline emission streams. The wet scrubbers shall be operated a minimum of 97% of the time the wafer process is operating on a 12 month rolling average basis. [06-096 CMR 115, BPT and A-370-71-T-M, March 4, 2004]
- B. The scrubber operations shall be monitored using pH. The pH shall be checked and recorded once per shift.
 1. The pH of the acid vapor scrubbing media shall be maintained above 5.
 2. The pH of the alkaline vapor scrubbing media shall be maintained at or below 5.[06-096 CMR 115, BPT]
- C. A maintenance log shall be kept for each of the scrubbers. The log shall contain dates, times, and reasons for all emission upsets, as well as description and dates of any maintenance, routine or otherwise, performed on the scrubbers. [06-096 CMR 115, BPT]
- D. An operations log shall be kept for each of the scrubbers. The log shall contain the dates, times, and reasons that the scrubbers are not operating (including periods of pH deviation). Fairchild Semiconductor shall also record the operating time of the wafer process. [06-096 CMR 115, BPT and A-370-71-T-M, March 4, 2004]
- E. Opacity from each scrubber stack shall not exceed 15% opacity on a six (6) minute average basis, except for no more than one (1) six (6) minute average in any one (1) hour period. [06-096 CMR 115, BPT and A-370-71-S-M, January 22, 2004]

(21) **Emergency Release Scrubber System**

- A. The bulk gas delivery system shall be controlled by the use of the Emergency Release Scrubber System. [A-370-71-R-M, Dec. 19, 2003]
- B. A maintenance and operational log shall be kept for the Emergency Release Scrubber System. The log shall contain dates and reasons for all emission upsets or activation of the system, as well as descriptions and dates of any maintenance (routine or otherwise) performed on the system. [A-370-71-R-M, Dec. 19, 2003]

(22) **HAP Processes**

- A. Fairchild Semiconductor shall be limited to 9.9 tons/year of any single HAP and 24.9 tons/year of total facility HAPs, based on a 12 month rolling total. [06-096 CMR 115, BPT]
- B. Fairchild Semiconductor shall maintain records on a monthly and 12 month rolling total for each HAP and total facility HAPs. The HAP emission calculations may be directly correlated to the VOC emissions calculations in Condition (19)(D) of this license. HAP emissions calculations shall be based on purchase records, SDS (safety data sheets) records for the various materials used in the facility, and whether the HAP emission points are controlled. [06-096 CMR 115, BPT]
- C. Fairchild Semiconductor shall comply with the applicable requirements of 40 CFR Part 63, Subpart WWWW, *National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations*. Compliance includes best management practices, including but not limited to: minimizing bath agitation when removing any parts processed in the tank; maximizing the draining of bath solution back into the tank; optimizing the design of barrels, racks, and parts to minimize drag out of bath solution; utilizing tank covers whenever practicable; minimizing or reducing heating of process tanks; performing regular repair maintenance and preventative maintenance of associated equipment; minimizing bath contamination; maintaining quality control of chemicals and bath ingredient concentration; performing general good housekeeping; minimizing spills, and performing regular inspections.

(23) **Parts Washer**

Parts washers at Fairchild Semiconductor may be subject to *Solvent Cleaners*, 06-096 CMR 130 (as amended).

- A. Fairchild Semiconductor shall keep records of the amount of solvent added to each parts washer. [06-096 CMR 115, BPT]
- B. The following are exempt from the requirements of 06-096 CMR 130 [06-096 CMR 130]:

1. Solvent cleaners using less than two liters (68 oz) of cleaning solvent with a vapor pressure of 1.00 mmHg, or less, at 20° C (68° F);
 2. Wipe cleaning; and,
 3. Cold cleaning machines using solvents containing less than or equal to 5% VOC by weight.
- C. The following standards apply to cold cleaning machines that are applicable sources under Chapter 130.
1. Fairchild Semiconductor shall attach a permanent conspicuous label to each unit summarizing the following operational standards [06-096 CMR 130]:
 - (i) Waste solvent shall be collected and stored in closed containers.
 - (ii) Cleaned parts shall be drained of solvent directly back to the cold cleaning machine by tipping or rotating the part for at least 15 seconds or until dripping ceases, whichever is longer.
 - (iii) Flushing of parts shall be performed with a solid solvent spray that is a solid fluid stream (not a fine, atomized or shower type spray) at a pressure that does not exceed 10 psig. Flushing shall be performed only within the freeboard area of the cold cleaning machine.
 - (iv) The cold cleaning machine shall not be exposed to drafts greater than 40 meters per minute when the cover is open.
 - (v) Sponges, fabric, wood, leather, paper products and other absorbent materials shall not be cleaned in the degreaser.
 - (vi) When a pump-agitated solvent bath is used, the agitator shall be operated to produce no observable splashing of the solvent against the tank walls or the parts being cleaned. Air agitated solvent baths may not be used.
 - (vii) Spills during solvent transfer shall be cleaned immediately. Sorbent material used to clean spills shall then be immediately stored in covered containers.
 - (viii) Work area fans shall not blow across the opening of the degreaser unit.
 - (ix) The solvent level shall not exceed the fill line.
 2. The remote reservoir cold cleaning machine shall be equipped with a perforated drain with a diameter of not more than six inches. [06-096 CMR 130]

(24) Fugitive Emissions

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed an opacity of 20%, except for no more than five (5) minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual fifteen (15)-second opacity observations which exceed 20% in any one (1) hour. [06-096 CMR 101]

(25) General Process Sources

Visible emissions from any general process source shall not exceed an opacity of 20% on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 1-hour period. [06-096 CMR 101]

(26) Facility-Wide Emissions

- A. Annual emissions limits for PM, SO₂, NO_x, and CO shall be 99.9 tons/year for minor source purposes. If the requirements for less than 99.9 tons/year of SO₂, NO_x, and CO are met, calculations show that PM emissions will also not exceed 99.9 tons/year and VOC emissions from fuel burning equipment will not exceed 15 tons/year. [06-096 CMR 115, BPT]
- B. From fuel records, the following equations shall be used to determine compliance with the annual emission limits:

$$\text{SO}_2 \quad \frac{\text{tons SO}_2}{\text{year}} = AD + \frac{[(0.141y)(s_2) + (0.0000006z)]}{2000} \leq 99.9 \text{ tons / year}$$

where:

- AD = annual quantity (tons) of SO₂ from the operation of all engines = sum of [(total hours of operation)(lb/hr limit)]/2000 for each unit;
y = annual quantity of distillate fuel combusted (gallons) in boilers;
s₂ = average sulfur content by weight of distillate fuel (percent);
z = annual quantity of natural gas combusted (standard cubic feet) in boilers.

NO_x

$$\frac{\text{tons NO}_x}{\text{year}} = AD + \frac{[(0.042y) + (0.0001z)]}{2000} \leq 99.9 \text{ tons / year}$$

where:

- AD = annual quantity (tons) of NO_x from the operation of all engines = sum of [(total hours of operation)(lb/hr limit)]/2000 for each unit;
y = annual quantity of distillate fuel combusted (gallons) in boilers;
z = annual quantity of natural gas combusted (standard cubic feet) in boilers.

CO

$$\frac{\text{ton CO}}{\text{year}} = AD + \frac{[(0.005y) + (0.000084z)]}{2000} \leq 99.9 \text{ tons / year}$$

where:

- AD = annual quantity (tons) of CO from the operation of all engines = sum of [(total hours of operation)(lb/hr limit)]/2000 for each unit;
y = annual quantity of distillate fuel combusted (gallons) in boilers;
z = annual quantity of natural gas combusted (standard cubic feet) in boilers.

(27) **Annual Emission Statement**

In accordance with *Emission Statements*, 06-096 CMR 137 (as amended), the licensee shall annually report to the Department the information necessary to accurately update the State's emission inventory by means of either:

- 1) A computer program and accompanying instructions supplied by the Department; or
- 2) A written emission statement containing the information required in 06-096 CMR 137.

The emission statement must be submitted as specified by the date in 06-096 CMR 137.

- (28) Fairchild Semiconductor shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S.A. §605).

DONE AND DATED IN AUGUSTA, MAINE THIS 4 DAY OF November, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PATRICIA W. AHO, COMMISSIONER

The term of this license shall be ten (10) years from the signature date above.

[Note: If a complete renewal application, as determined by the Department, is submitted prior to expiration of this license, then pursuant to Title 5 MRSA §10002, all terms and conditions of the license shall remain in effect until the Department takes final action on the renewal of the license.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: September 9, 2014

Date of application acceptance: September 10, 2014

Date filed with the Board of Environmental Protection:

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.

