

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date: PROPOSED, 2005

CDS ID No. 3708101022 MACT ZZZZ

Region: Winston-Salem Regional Office
County: Guilford
NC Facility ID: 4101022
Inspector's Name: Steve Moser
Date of Last Inspection: 01/26/2005
Compliance Code: C/In Compliance With
 Procedural Reqr

Facility Data			Permit Applicability (this application only)	
<p>Applicant (Facility's Name): RF Micro Devices, Inc. - FAB 1, FAB 3 and Packaging</p> <p>Facility Address: RF Micro Devices, Inc. - FAB 1, FAB 3 and Packaging 7914 Piedmont Triad Parkway Greensboro, NC 27409</p> <p>SIC: 3674 / Semiconductors & Related Devices NAICS: 33422 / Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>			<p>SIP: NSPS: NESHAP: PSD: PSD Avoidance: NC Toxics: 112(r): Other: First Time Title V</p>	
Contact Data			Application Data	
Facility Contact	Authorized Contact	Technical Contact	<p>Application Number: 4101022.05A Date Received: 02/18/2005 Application Type: Modification Application Schedule: TV-1st Time Existing Permit Data Existing Permit Number: 08409/R06 Existing Permit Issue Date: 07/01/2004 Existing Permit Expiration Date: 12/31/2008</p>	
Erich Burke Senior Environmental Engineer (336) 931-8042 7628 Thorndike Road Greensboro NC, 27409+9421	James Schonover Director of Facilities (336) 678-8087 7628 Thorndike Road Greensboro NC, 27409+9421	Erich Burke Senior Environmental Engineer (336) 931-8042 7628 Thorndike Road Greensboro NC, 27409+9421		
<p>Review Engineer: Mike Brandon</p> <p>Review Engineer's Signature: _____ Date: July 14, 2005</p>			<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 08409/R07 Permit Issue Date: PROPOSED, 2005 Permit Expiration Date: 5yr+issued date</p>	

I. Introduction

This facility removed their synthetic minor condition and requires a first time Title V Operating Permit. This first time Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the Title V operating permit. The primary source of information used to compile the operating permit is the above referenced air permit application.

II. Background Information

The Title V operating permit replaces an existing Air Quality Construction and Operation Permit No. 08409R06 that was issued on July 1, 2004 and is currently scheduled to expire on December 31, 2008.

RF Micro Devices, Inc. submitted a complete Title V application to the Division of Air Quality on February 18, 2005 pursuant to the permit R06 requirement (15A NCAC 2Q .0504) for the submittal within one year of changing the facility status from synthetic minor (i.e., July 1, 2005). The permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

III. Facility Description

This facility produces semiconductors.

IV. Statement of Compliance

The facility was issued a Notice of Violation for failure to maintain TAP records for chlorobenzene and arsenic on February 2, 2005. The facility is apparently in compliance with all remaining applicable regulations and permit conditions. [The facility is required to provide test notification (60 days prior to compliance test) and perform compliance testing of CO by August 15, 2005 (testing completed 180 days after the start up date of February 15, 2005) pursuant to the Boiler MACT for the natural gas/No. 2 fuel oil-fired boiler (ID No. ESB33). The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

V. Summary of Emission Sources and Control Devices

The following table identifies all emission sources and associated control devices for which the First Time Title V Operating Permit is being issued.

Emission Source ID	Emission Source Description	Control System ID	Control System Description
FAB 1 SEMICONDUCTOR MANUFACTURING OPERATION			
ESMAN1 MACT BBBB	semiconductor manufacturing line Consisting of various organic and inorganic emission sources from processes including photolithography, metallization, etch and deposition, and testing. Emissions are vented via the acid gas exhaust or the solvent exhaust. Only acid gas exhaust is vented to scrubbers for control. ICP etching is vented to the stirred tank control devices in series with the acid gas scrubbers.	CDEB1 and CDEB2 CD1 and CD2	ICP etching vented to two parallel constant stirred tank particulate abatement devices vented to acid gas exhaust system vented to two parallel cross flow packed bed acid gas scrubbers; 200 gallons per minute minimum caustic solution injection each
EST1, EST2, EST3 MACT BBBB	three waste solvent storage tanks; 2,500 gallons each	N/A	N/A
ESG1 MACT ZZZZ	No. 2 fuel oil-fired emergency generator; 2,200 kilowatts output	N/A	N/A
G1 MACT ZZZZ	500 kW diesel generator	N/A	N/A
B4, B5, B6, B7, and B8	Five natural gas-fired boilers; 1.56 million Btu per hour heat input each	N/A	N/A
B9	small tool parts bead blast system with integral cyclone	CDB9	cartridge filter
FAB 3 SEMICONDUCTOR MANUFACTURING OPERATION			
ESG31, ESG32, ESG33, ESG34, ESG35 MACT ZZZZ	five No. 2 fuel oil-fired emergency generators; 2,200 kilowatts output each	N/A	N/A
ESB31, ESB32 NSPS DC	two natural gas/No. 2 fuel oil-fired boilers; 16.33 million Btu per hour heat input each	N/A	N/A
ESB33 NSPS DC MACT DDDDD	natural gas/No. 2 fuel oil-fired boiler; 16.33 million Btu per hour heat input	N/A	N/A

Emission Source ID	Emission Source Description	Control System ID	Control System Description
ESMAN31 MACT BBBBB	semiconductor manufacturing line Consisting of various organic and inorganic emission sources from processes including photolithography, metallization, etch and deposition, testing, and common (with ES-MAN32) backside operations. Emissions are vented via the acid gas exhaust or the solvent exhaust. Only acid gas exhaust is vented to scrubbers for control. ICP etching is vented to the stirred tank control devices in series with the acid gas scrubbers.	CDEB3, CDEB4, and CDEB5 CD31 and CD32	ICP etching vented to three parallel stirred tank particulate abatement devices vented to acid gas exhaust system vented to two parallel packed bed acid gas scrubbers; 200 gallons per minute minimum caustic solution injection each
ESMAN32 MACT BBBBB	semiconductor manufacturing line Consisting of various organic and inorganic emission sources from processes including photolithography, metallization, etch and deposition, testing, and common (with ESMAN31) backside operations. Emissions are vented via the acid gas exhaust or the solvent exhaust. Only acid gas exhaust is vented to scrubbers for control. ICP etching is vented to the stirred tank control devices in series with the acid gas scrubbers.	CDEB6 CD33	ICP etching vented to stirred tank particulate abatement device vented to acid gas exhaust system vented to packed bed acid gas scrubber; 200 gallons per minute caustic solution injection
EST31 MACT BBBBB	waste solvent storage tank; 8,000 gallon	N/A	N/A
EST32 MACT BBBBB	waste solvent storage tank; 5,000 gallon	N/A	N/A
EST33 MACT BBBBB	waste solvent storage tank; 3,530 gallon	N/A	N/A
B10	small tool parts bead blast system with integral cyclone	CDB10	cartridge filter
PACKAGING FACILITY			
ESGP MACT ZZZZ	No. 2 fuel oil-fired emergency generator; 2,200 kilowatts output	N/A	N/A
B1, B2, B3	three natural gas-fired boilers; 3.5 million Btu per hour heat input each	N/A	N/A
PL	packaging lab operations	N/A	N/A

VI. Emission Source-by-Source Evaluation

A. Semi Conductor Manufacturing Lines (ID Nos. ESMAN1, ESMAN31, ESMAN32) and associated particulate control devices for ICP Etching (ID Nos. CDED1 through CDEB6) and acid gas control scrubbers (ID Nos. CD1, CD2, CD31, CD32, and CD33)

1. Description
Semiconductors are made using inductively coupled plasma etch, chemical vapor deposition, masking/developing, non HAP vapor degreasing, acids, and solvents in various process stages. All of the processes are treated as one effected unit for regulatory applicability. The processes result in emissions of VOC, HAP, and PM.
2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	E = 4.10P ^{0.67} where; E = allowable emission rate in pounds per hour, and P = process weight in tons per hour for P ≤ 30	15A NCAC 2D. 0515
visible emissions	20 percent opacity	15A NCAC 2D. 0521
VOC	Work Practice Standards - See Multiple Emission Sources Section VII.A.1.	15A NCAC 2D. 0958
TAP	Control of Toxic Air Pollutants - See Multiple Emission Sources Section VII.A.2.	15A NCAC 2D. 1100
VOC	PSD Avoidance Condition - See Multiple Emission Sources Section VII.A.3.	15A NCAC 2Q. 0317
TAP	Toxic Air Pollutant Toxic Pollutant Exemption Levels (TPERs) - See Multiple Emission Sources Section VII.A.5.	15A NCAC 2Q. 0711
HAP	Maximum Achievable Control Technology for Semi Conductor Manufacturing - See Multiple Emission Sources Section VII.B.1.	15A NCAC 2D. 1111 (40 CFR 63, Subpart BBBBB)
odor	The facility shall not operate without proper odor abatement practices or control devices - See Multiple Emission Sources Section 2.2 VII.6.	15A NCAC 2D. 1806

a. **15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES**

i. Regulatory Analysis

The inductively coupled plasma etch and operations with acid mists result in particulate emissions. Effective use of the stirred tank abatement devices and a packed bed scrubber will ensure minimal emissions. No allowable emission was calculated for the processes as they are numerous and not well defined. However, it may be safely assumed that controlled particulate emissions will be in compliance.

ii. Monitoring Requirements

The Permittee is required to monitor scrubber flow on a daily basis and perform monthly visual inspections of each scrubber system and for leaks; and perform an annual initial inspection of packing and spray nozzles through sight glasses installed in the scrubber body. The minimum flow rate (200 gallons per minute) was established from the low flow alarm rate in lieu of the presently permitted values. The old flow rates are design parameters for the scrubbers under maximum capacity, which does not presently occur. Implementation of MACT will require the establishment of parameters pertinent to compliance for acid gases. In the mean time, it is anticipated that little or no particulate will be emitted through the packed bed scrubber with a flow sufficient to wash the packing and the pre particulate control devices (stirred tanks) for insoluble particulate matter.

iii. Recordkeeping Requirements

The Permittee is required to maintain records of all inspections and equipment repair.

iv. Reporting Requirements

Semi annual reports require a summary of monitoring activity and any equipment repair.

b. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**

i. Regulatory Analysis

Visual emissions from each source may not exceed 20 percent opacity. Compliance with this limitation is anticipated due to the use of the scrubbers.

- ii. **Monitoring Requirements**
The Permittee is required monitor emissions from each source monthly to verify that no abnormal emissions occur. At most, opacity due to water vapor is expected.
- iii. **Recordkeeping Requirements**
The Permittee is required to maintain records of all inspections.
- iv. **Reporting Requirements**
Semi annual reports require a summary of monitoring activity and any anomalies.

B. Small tool parts bead blast system (ID No. B9) with integral cyclone and cartridge filter (ID No. CDB9)

Small tool parts bead blast system (ID No. B10) with integral cyclone and cartridge filter (ID No. CDB10)

- 1. **Description**
This equipment is used to clean parts exposed to the semiconductor substrate and results in emissions of particulate matter and arsenic. They would be insignificant if not for modeling pursuant to 15A NCAC 2D .1100.
- 2. **Applicable Regulatory Requirements**
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	$E = 4.10P^{0.67}$ where; E = allowable emission rate in pounds per hour, and P = process weight in tons per hour for $P \leq 30$	15A NCAC 2D. 0515
visible emissions	20 percent opacity	15A NCAC 2D. 0521
TAP	Control of Toxic Air Pollutants - See Multiple Emission Sources Section VII. A.2.	15A NCAC 2D. 1100

- a. **15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES**
 - i. **Regulatory Analysis**
These sources of particulate must comply with the process weight rate determined emission limit. These operations are conducted in a batch mode. Emissions will effectively be controlled by a cartridge filter and are estimated to fully comply with the allowable emission based on throughput weight.
 - ii. **Monitoring/Recordkeeping Requirements**
The Permittee is required to maintain the cartridge filter and monitor the collection/control systems for leaks monthly.
 - iv. **Reporting Requirements**
Semi annual reporting of maintenance and inspections is required.
- c. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
 - i. **Regulatory Analysis**
Visual emissions from each source may not exceed 20 percent opacity. Compliance with this limitation is anticipated due to the use of control equipment.

- ii. **Monitoring Requirements**
The Permittee is required monitor emissions from each source monthly verify that no abnormal emissions occur.
- iii. **Recordkeeping Requirements**
The Permittee is required to maintain records of all inspections.
- iv. **Reporting Requirements**
Semi annual reports require a summary of monitoring activity and any anomalies.

C. Six Waste Solvent Storage Tanks (ID Nos. EST1, EST2, EST3, EST31, EST32, EST33)

- 1. **Description**
These are tanks used to store spent solvents from the semiconductor manufacturing processes
- 2. **Applicable Regulatory Requirements**
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOC	Work Practice Standards - See Multiple Emission Sources Section VII. A.1.	15A NCAC 2D. 0958
TAP	Control of Toxic Air Pollutants - See Multiple Emission Sources Section VII.A.2.	15A NCAC 2D. 1100
VOC	PSD Avoidance Condition - See Multiple Emission Sources Section VII.A.3.	15A NCAC 2Q. 0317
TAP	Toxic Air Pollutant Toxic Pollutant Exemption Levels (TPERs) - See Multiple Emission Sources Section VII.A.5.	15A NCAC 2Q. 0711
HAP	Maximum Achievable Control Technology for Semi Conductor Manufacturing - See Multiple Emission Sources Section VII. B.1.	15A NCAC 2D. 1111 (40 CFR 63, Subpart BBBBB)
odor	The facility shall not operate without proper odor abatement practices or control devices - See Multiple Emission Sources Section VII.A.6.	15A NCAC 2D. 1806

D. Seven 2,200kW Diesel-fired Emergency Generators (ID Nos. ESG1, ESG31, ESG32, ESG33, ESG34, ESG35, and ESGP) and 500 kW diesel-fired Emergency Generator at FAB 1 (ID No. G1)

1. Description
These are diesel engine (internal combustion) powered electricity generators to ensure power for the facility. These are used for emergency power production. They are exempt from all RICE MACT requirements pursuant to 40 CFR 63.6590(b)(3).
2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
SO ₂	Sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input.	15A NCAC 2D. 0516
visible emissions	20 percent opacity	15A NCAC 2D. 0521
HAP	NESHAP for Reciprocating Internal Combustion Engines No applicable requirements - 40 CFR63.6590(b)(3)	15A NCAC 2D. 1111 40 CFR 63, Subpart ZZZZ
SO ₂	PSD Avoidance Condition - See Multiple Emission Sources Section VII. A.4.	15A NCAC 2Q. 0317

- a. **15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSSTION SOURCES**
 - i. Regulatory Analysis
These sources are limited to 2.3 pounds of SO₂ per million Btu heat input. Estimated emissions are estimated to be about 0.505 pounds per million Btu heat input based on a maximum fuel oil sulfur content for distillate oil (No. 2 fuel oil) of 0.5 percent by weight.
 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil.
- b. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
 - i. Regulatory Analysis
Visual emissions from each source may not exceed 20 percent opacity. Compliance with this limitation is anticipated under proper operation.
 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil.

E. Two natural gas/No. 2 fuel oil-fired boilers (ID Nos. ESB31 and ESB32)

1. Description
These are process heat boilers (external combustion).

2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	particulate emissions shall not exceed 0.3658 pounds per million Btu heat input	15A NCAC 2D. 0503
SO ₂	Sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input.	15A NCAC 2D. 0516
visible emissions	20 percent opacity	15A NCAC 2D. 0521
SO ₂	Fuel sulfur content shall not exceed 0.5 percent by weight.	15A NCAC 2D. 0524 40 CFR 60, Subpart Dc
HAP	NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters. 63.7506(b)- only initial notification is required.	15A NCAC 2D .1111 40 CFR 63, Subpart DDDDD
SO ₂	PSD Avoidance Condition - See Multiple Emission Sources Section VII.A.4.	15A NCAC 2Q. 0317

- a. **15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS**
 - i. Regulatory Analysis
Emissions of particulate matter from these boilers shall not exceed 0.3658 pounds per million Btu heat input. This allowable emission rate was determined based on the facility wide heat input for all external combustion sources of about 67.3 million Btu per hour.

 - ii. Monitoring/Recordkeeping/Reporting
No monitoring/recordkeeping/reporting is required for particulate emissions from the firing of natural gas or No. 2 fuel oil in these boilers.

- b. **15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES**
 - i. Regulatory Analysis
These sources are limited to 2.3 pounds of SO₂ per million Btu heat input. Estimated emissions are estimated to be about 0.505 pounds per million Btu heat input based on maximum fuel oil sulfur content for distillate oil (No. 2 fuel oil) of 0.5 percent by weight.

 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil or natural gas.

- c. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
 - i. Regulatory Analysis
Visual emissions from each source may not exceed 20 percent opacity. Compliance with this limitation is anticipated under proper operation.

 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil or natural gas.

d. **15A NCAC 2D .0524: NSPS Subpart Dc Industrial-Commercial-Institutional Steam Generators**

- i. **Regulatory Analysis**
 This new source performance standard limits sulfur dioxide emissions from these boilers via fuel oil sulfur content. The compliance option will require fuel oil supplier certification that the distillate oil sulfur content does not exceed 0.5 percent by weight.
- ii. **Monitoring**
 The Permittee has to track monthly fuel use in each boiler and fuel oil supplier certifications for all shipments of fuel oil received and burned in these boilers.
- iii. **Recordkeeping**
 Fuel oil supplier certification of distillate oil sulfur content and fuels burned in each boiler.
- iv. **Reporting Requirements**
 Semi annual reports of fuel oil supplier certification that fuel oil sulfur content did not exceed 0.5 percent by weight and certification that only natural gas and distillate oil were combusted.

**F. Three Packaging Facility natural gas-fired boilers (ID Nos. B1, B2 and B3)
 Five FAB1 natural gas-fired boilers (ID No. B4, B5, B6, B7, and B8)**

- 1. **Description**
 These are process heat boilers (external combustion).
- 2. **Applicable Regulatory Requirements**
 The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	particulate emissions shall not exceed 0.3658 pounds per million Btu heat input	15A NCAC 2D. 0503
SO ₂	Sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input.	15A NCAC 2D. 0516
visible emissions	20 percent opacity	15A NCAC 2D. 0521
SO ₂	PSD Avoidance Condition - See Multiple Emission Sources Section VII.A.4.	15A NCAC 2Q. 0317

a. **15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS**

- i. **Regulatory Analysis**
 Emissions of particulate matter from these boilers shall not exceed 0.3658 pounds per million Btu heat input. This allowable emission rate was determined based on the facility wide heat input for all external combustion sources of about 67.3 million Btu per hour.
- ii. **Monitoring/Recordkeeping/Reporting**
 No monitoring/recordkeeping/reporting is required for particulate emissions from the firing of natural gas or No. 2 fuel oil in these boilers.

- b. **15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSSTION SOURCES**
 - i. Regulatory Analysis
These sources are limited to 2.3 pounds of SO₂ per million Btu heat input. Estimated emissions are estimated to be about 0.505 pounds per million Btu heat input based on maximum fuel oil sulfur content for distillate oil (No. 2 fuel oil) of 0.5 percent by weight.
 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil or natural gas.
- c. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
 - i. Regulatory Analysis
Visual emissions from each source may not exceed 20 percent opacity. Compliance with this limitation is anticipated under proper operation.
 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil or natural gas.

G. Natural gas/No. 2 fuel oil-fired boiler (ID No. ESB33)

- 1. Description
This is process heat boiler (external combustion).
- 2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	particulate emissions shall not exceed 0.3658 pounds per million Btu heat input	15A NCAC 2D. 0503
SO ₂	Sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input.	15A NCAC 2D. 0516
visible emissions	20 percent opacity	15A NCAC 2D. 0521
SO ₂	Fuel sulfur content shall not exceed 0.5 percent by weight.	15A NCAC 2D. 0524 40 CFR 60, Subpart Dc
HAP	NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters 1. Particulate emissions shall not exceed 0.03 pounds per million Btu heat input. 2. Hydrogen chloride emissions shall not exceed 0.0009 pounds per million Btu heat input. 3. Carbon monoxide concentration shall not exceed 400 ppmv on a dry basis corrected to three percent oxygen (three run average)	15A NCAC 2D .1111 40 CFR 63, Subpart DDDDD
SO ₂	PSD Avoidance Condition - See Multiple Emission Sources Section VII.A.4.	15A NCAC 2Q. 0317

- a. **15A NCAC 2D .0503: PARTICULATES FROM FUEL BURNING INDIRECT HEAT EXCHANGERS**
 - i. Regulatory Analysis
Emissions of particulate matter from these boilers shall not exceed 0.3658 pounds per million Btu heat input. This allowable emission rate was determined based on the facility wide heat input for all external combustion sources of about 67.3 million Btu per hour.
 - ii. Monitoring/Recordkeeping/Reporting
No monitoring/recordkeeping/reporting is required for particulate emissions from the firing of natural gas or No. 2 fuel oil in these boilers.
- b. **15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES**
 - i. Regulatory Analysis
These sources are limited to 2.3 pounds of SO₂ per million Btu heat input. Estimated emissions are estimated to be about 0.505 pounds per million Btu heat input based on maximum fuel oil sulfur content for distillate oil (No. 2 fuel oil) of 0.5 percent by weight.
 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil or natural gas.
- c. **15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS**
 - i. Regulatory Analysis
Visual emissions from each source may not exceed 20 percent opacity. Compliance with this limitation is anticipated under proper operation.
 - ii. Monitoring/Recordkeeping/Reporting Requirements
No monitoring, recordkeeping, or reporting is required for the combustion of distillate oil or natural gas.
- d. **15A NCAC 2D .0524: NSPS Subpart Dc Industrial-Commercial-Institutional Steam Generators**
 - i. Regulatory Analysis
This new source performance standard limits sulfur dioxide emissions from these boilers via fuel oil sulfur content. The compliance option will require fuel oil supplier certification that the distillate oil sulfur content does not exceed 0.5 percent by weight.
 - ii. Monitoring
The Permittee has to track monthly fuel use in each boiler and fuel oil supplier certifications for all shipments of fuel oil received and burned in these boilers.
 - iii. Recordkeeping
Fuel oil supplier certification of distillate oil sulfur content and fuels burned in each boiler.
 - iv. Reporting Requirements
Semi annual reports of fuel oil supplier certification that fuel oil sulfur content did not exceed 0.5 percent by weight and certification that only natural gas and distillate oil were combusted.
- e. **15A NCAC 2D .1111: NESHAP Subpart DDDDD National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters**
 - i. Regulatory Analysis
This MACT standard consists of an emission limit for PM of 0.03 pounds per million Btu heat input, an emission limit for hydrogen chloride of 0.0009 pounds per million Btu heat input, and a work practice standard for carbon monoxide emissions of 400 ppmv (dry basis, corrected to 3 percent oxygen, three run average). The compliance date is the start up date of February 15, 2005. The Permittee is also required to develop a start-up, shutdown, and malfunction plan.

- ii. Testing
The Permittee is required to complete testing of carbon monoxide by August 15, 2005 and submit a notification of compliance (i.e., test report) demonstrating compliance with the CO limit by November 15, 2005. The CO test must be conducted annually thereafter within one month prior to the anniversary date of the last test. There are no testing requirements for PM or HCl for the use of gaseous and distillate fuel oil (63.7506).
- iii. Monitoring
The Permittee has to track monthly fuel use in the boiler and any startup, shut down or malfunctions.
- iii. Recordkeeping
The Permittee is required to maintain testing records, records of compliance notification, and records of fuel use demonstrating that only gaseous and distillate oils were combusted.
- iv. Reporting Requirements
The Permittee is require to:
 - (A) submit immediate malfunction reports,
 - (B) semi annual reports of fuel used and certification that only distillate oil and natural gas were combusted, and
 - (C) annual notification of compliance with the CO work practice standard.

H. Packaging and Laboratory Operations (ID No. PL)

- 1. Description
This is packaging and laboratory operations.
- 2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOC	Work Practice Standards - See Multiple Emission Sources Section VII.A.1.	15A NCAC 2D. 0958
TAP	Control of Toxic Air Pollutants - See Multiple Emission Sources Section VII.A.2.	15A NCAC 2D. 1100
VOC	PSD Avoidance Condition - See Multiple Emission Sources Section VII.A.3.	15A NCAC 2Q. 0317
TAP	Toxic Air Pollutant Toxic Pollutant Exemption Levels (TPERs) - See Multiple Emission Sources Section VII.A.5.	15A NCAC 2Q. 0711
odor	The facility shall not operate without proper odor abatement practices or control devices - See Multiple Emission Sources Section VII.A.6.	15A NCAC 2D. 1806

VII. Multiple Emission Source Limits

A. Facility Wide

All facility emission sources are subject to these limits and/or standards:

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOC	Work Practice Standards - Section VII.A.1.	15A NCAC 2D. 0958
TAP	Control of Toxic Air Pollutants - Section VII.A.2.	15A NCAC 2D. 1100
VOC	PSD Avoidance Condition - Section VII.A.3.	15A NCAC 2Q. 0317
SO ₂	PSD Avoidance Condition - Section VII.A.4.	15A NCAC 2Q. 0317
TAP	Toxic Air Pollutant Exemption Rates - Section VII.A.5.	15A NCAC 2Q. 0711
odor	The facility shall not operate without proper odor abatement practices or control devices - Section VII.A.6.	15A NCAC 2D. 1806

- 1. 15A NCAC 2D .0958: WORK PRACTICES FOR SOURCES OF VOLATILE ORGANIC COMPOUNDS**
 This permit requirement applies facility wide and provides housekeeping and work practice standards to prevent fugitive emissions of VOC to the atmosphere. Monthly inspections are required to ensure the work practice and housekeeping standards are being implemented. Records of inspections are required and semi annual reporting of deviations.
- 2. 15A NCAC 2D .1100 CONTROL OF TOXIC AIR POLLUTANT EMISSIONS**
 The facility has been modeled for chlorine, chlorobenzene, xylene, and arsenic. Emission limits for these compounds were established on a facility wide basis from a single worst case stack.
- 3. 15A NCAC 2Q .0317 PSD MAJOR SOURCE AVOIDANCE CONDITION for VOC**
 The Permittee is required to track all VOC used at the facility. Emissions will be determined monthly with a rolling annual total not to exceed 250 tons per consecutive 12-month period. Since this facility is in an early action compact non-attainment area for VOC/NOx, the county will be subject to the non-attainment NSR rules (offset interpretive ruling) if it is not redesignated attainment in 2008. This will make the PSD avoidance condition moot, and the facility will be major for consideration of any new source review requirements for modification or new construction. Emissions are calculated using monthly purchase and off site shipment records.
- 4. 15A NCAC 2Q .0317 PSD MAJOR SOURCE AVOIDANCE CONDITION for SO₂**
 The Permittee is required to track distillate fuel oil use at the facility. Emissions will be determined monthly with a rolling annual total not to exceed 250 tons per consecutive 12-month period. Emissions are calculated using current AP-42 factors for boilers and large internal combustion engines combusting distillate oil. Contributions from natural gas combustion are considered to be insignificant and no tracking was required for the rolling total calculation.
- 5. 15A NCAC 2Q .0711 TOXIC AIR POLLUTANT EXEMPTION RATES**
 The facility presently emits eight TAPs, each of which is below its respective TPER. These TAPs include ammonia, beryllium, bromine, hydrochloric acid, hydrogen fluoride, nitric acid, phenol, and sulfuric acid.
- 6. 15A NCAC 2D .1806: CONTROL AND PROHIBITION OF ODOROUS EMISSIONS**
 This "state enforceable only" permit requirement applies facility wide and prohibits the Permittee from operating the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

**B. Semiconductor Manufacturing (ID Nos. ES-MAN1, ES-MAN31, and ES-MAN32)
Waste Solvent Tanks (ID Nos. ES-T1, ES-T2, ES-T3, ES-T31, ES-T32, and ES-T33)**

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAP	NESHAP for Semiconductor Manufacturing	15A NCAC 2D.1111 (40 CFR 63, Subpart BBBBB)

1. **15A NCAC 2D .1111 [40 CFR Part 63 Subpart BBBBB]: NESHAP for Semiconductor Manufacturing**
The Permittee shall comply with all applicable provisions contained in Environmental Management Commission Standard 15A NCAC 2D .1111, "Maximum Achievable Control Technology" (MACT) as promulgated in 40 CFR Part 63, Subpart BBBBB by July 1, 2007. [40 CFR 63.2233(b)]
 - a. Demonstration of compliance must be made no later than January 1, 2008 [40 CFR 63.7186].
 - b. Notification of compliance status is due by March 1, 2008 if a performance test is required or by February 1, 2007 if a performance test is not required [40 CFR 63.7189(e)] and shall consist of:
 - i. compliance test results or other initial compliance demonstration, as appropriate, submitted to the DAQ regional office and
 - ii. a permit application submitted to the DAQ central office for the incorporation of all work practice standards, emission limits, and monitoring, recordkeeping, and reporting requirements to this permit.

VIII. General Conditions

The General Conditions section of the Title V Operating Permits lists additional applicable rule requirements that the Permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

IX. Insignificant Activities

There are no insignificant activities listed in the application as there are state and federally enforceable requirements for all emission sources.

X. Public Notice

Pursuant to 15A NCAC 2Q .0521, a notice of the Title V Operating Permit will be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30day comment period with an opportunity for a public hearing and comment. Copies of the public notice were sent to persons on the Title V mailing list, affected states, and EPA.

XI. Recommendations

The first time Title V application for RF Micro Devices has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a final determination that the facility will achieve compliance as specified in the permit with all applicable requirements.