



South Coast Air Quality Management District



21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

August 13, 2010

Mr. Gerardo C. Rios
Chief, Permit Office
US EPA Region IX Air 3
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Rios:

Subject: International Rectifier Hexfet America (I.D. 48522) Title V Permit Revision

International Rectifier Hexfet America has proposed to revise their Title V permit by:

1. Installing a new wafer etching and stripping line;
2. Adding stored chemicals to two chemical storage tanks;
3. Changing stored chemicals in and changing throughput limits to three chemical storage tanks; and
4. Modifying two integrated circuit manufacturing systems, two photolithographic systems, and four associated air pollution control systems.
5. Correcting a typo in Condition 3 of Permit G4072 (A/N 498032) by adding Tank No. 5 venting requirement which was missed when Permit G4072 was issued.

This is an integrated circuits manufacturing facility (SIC 3674) located at 41915 Business Park Drive, Temecula, CA 92590. This proposed permit revision is considered as a "de minimis significant permit revision" to their Title V permit. Enclosed for your review are the permit evaluation and the proposed permit. With your receipt of the proposed Title V permit revision today, we will note that the EPA 45-day review period begins on August 13, 2010.

If you have any questions or need additional information regarding the proposed permit revision, please contact Mr. Kien Huynh at (909) 396-2635.

Sincerely,

Brian L. Yeh
Senior Manager
Chemical/Mechanical Operations

BLY:kh

Enclosures

ENGINEERING & COMPLIANCE

APPLICATION PROCESSING AND CALCULATIONS

Applicant's Name: International Rectifier
Mailing Address: 41915 Business Park Dr.
 Temecula, CA 92590

Equipment Location: Same

Equipment Descriptions:APPLICATION NO. 511730:

ALTERATION TO I C MANUFACTURING PERMIT TO OPERATE G9347 (A/N 510417) BY:
 THE ADDITION OF:

- ONE ATMOSPHERIC HORIZONTAL DIFFUSION FURNACE, BTI MODEL BDF41
- TWO PLASMA ETCHERS, APPLIED MATERIALS MODEL P5000

AND THE REMOVAL OF:

- ONE ATMOSPHERIC DIFFUSION FURNACE , BTU/BRUCE MODEL BDF-4.
- ONE PLASMA ETCHER , GASONICS MODEL AE2001.

APPLICATION NO. 511731:

ALTERATION TO INTEGRATED CIRCUIT FABRICATION SYSTEM PERMIT TO OPERATE
 G8268 (A/N 504815) BY:

THE ADDITION OF:

- ONE ATMOSPHERIC DIFFUSION FURNACE, BTI MODEL BDF41
- ONE LPCVD TEOS TUBE TO DIFFUSION FURNACE BTI MODEL BDF41
- ONE PLASMA ETCHER, LAM MODEL 490
- ONE ETCHER, GASONICS MODEL AE2001

AND THE REMOVAL OF:

- ONE LPCVD LTO TUBE TO DIFFUSION FURNACE BTI MODEL BDF41 , BTU/BRUCE MODEL BDF-4.
- TWO ASHERS, GASONICS MODEL A1000

APPLICATION NO. 511732:

ALTERATION TO AIR POLLUTION SYSTEM PERMIT TO OPERATE G9350 (A/N 510421) BY:

THE ADDITION OF :

- VENTING TWO P5000 ETCHERS

AND THE REMOVAL OF:

- VENTING ONE PLASMA ETCHER

APPLICATION NO. 511733:

ALTERATION TO AIR POLLUTION CONTROL SYSTEM PERMIT TO OPERATE G9351 (A/N
 510422) BY:

THE ADDITION OF:

- VENTING ONE DIFFUSION FURNACE

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	Page 2 of 10 A/Ns 511730 et al Processed By KH Checked By Date 8/7/10
---	---

- VENTING ONE PLASMA ETCHER
- VENTING ONE WAFER GRINDER
- VENTING WAFER ETCHING AND STRIPPING LINE

AND THE REMOVAL OF :

- VENTING ONE ETCHER

APPLICATION NO. 511735:

ALTERATION TO PHOTOLITHOGRAPHIC SYSTEM PERMIT TO OPERATE G8253 (A/N 503213)
BY:

THE ADDITION OF:

- ONE PHOTOLITHOGRAPHIC TRACK, SVG MODEL 86 SERIES
- ONE PHOTOLITHOGRAPHIC TRACK, TEL MARK 7
- ONE PHOTOLITHOGRAPHIC TRACK, SVG MODEL 88 SERIES

APPLICATION NO. 511736:

ALTERATION TO PHOTOLITHOGRAPHIC SYSTEM PERMIT TO OPERATE G2002 (A/N 460747)
BY:

THE REMOVAL OF:

- ONE PHOTOLITHOGRAPHIC TRACK, SVG, MODEL 86 SERIES

APPLICATION NO. 511737:

ALTERATION TO AIR POLLUTION CONTROL SYSTEM PERMIT TO OPERATE G8254 (A/N 503214) BY:

THE ADDITION OF :

- VENTING TWO PHOTOTRACKS

APPLICATION NO. 511738:

ALTERATION TO AIR POLLUTION CONTROL SYSTEM PERMIT TO OPERATE G8264 (A/N 503222) BY:

THE ADDITION OF :

- VENTING TWO PHOTOTRACKS
- VENTING ONE WAFER ETCHING AND STRIPPING LINE

APPLICATION NO. 511739:

STORAGE TANK T-517, MIXED ACIDS, VERTICAL, 4' - 0"DIA. x 5' - 7"L., 500 GALLON CAPACITY.

APPLICATION NO. 511741:

STORAGE TANK T-14, MIXED ACIDS, HORIZONTAL, 10' - 0"DIA. x 11' - 6"L., 5,728 GALLON CAPACITY, WITH TWO 10 HP TRANSFER PUMPS.

APPLICATION NO. 511742:

STORAGE TANK T-151, BUFFERED OXIDE ETCH, VERTICAL, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY, WITH ONE 0.43 HP MIXER.

APPLICATION NO. 511744:

STORAGE TANK T-155, HYDROCHLORIC ACID, VERTICAL, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY.

APPLICATION NO. 511745:

STORAGE TANK T-141, DILUTE HYDROFLUORIC ACID, HORIZONTAL, 7' - 0"DIA. x 20' - 6"L., 5,000 GALLON CAPACITY.

APPLICATION NO. 511746:

WAFER ETCHING AND STRIPPING LINE NO. 3, AKRION GAMA SERIES, CONSISTING OF:

1. TANK NO. 1, ETCHING/MILLING, HYDROGEN FLUORIDE/AMMONIUM FLUORIDE, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 3-KW HEATER.
2. TANK NO. 4, STRIPPING, SULFURIC ACID/HYDROGEN PEROXIDE, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 8-KW HEATER.
3. TANK NO. 6, RINSING/DRYING, DEIONIZED WATER WITH ISOPROPYL ALCOHOL, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 3-KW HEATER.
4. ASSOCIATED RINSE TANKS.

HISTORY:

Application(s) received on: 6/15/10

Equipment modified: No

Violations recorded:

1 Notice of Violation has been issued in the last two years. The notice, P30664, was issued for a violation on 1-16-09 for exceeding permitted throughput limits on four chemical storage tanks, chemical usage limit on one integrated circuit manufacturing system, and fuel consumption limit on an oxidizer. The facility has since corrected the problem and is currently operating in compliance with all applicable rules and regulations.

Facility type:

RECLAIM	Title V
No	Yes

ENGINEERING & COMPLIANCE

APPLICATION PROCESSING AND CALCULATIONS

Below is a table with a brief explanation of the requested modifications and change of conditions. Please see application submittal and additional information following the table for more details.

511730	I C Manufacturing	510417	G9347	Mod P/C	Add/remove tools and increase chemical usage limits (See details below)
511731	I C Manufacturing	504815	G8268	Mod P/C	Add/remove tools and increase chemical usage limits (See details below)
511732	Scrubbers 1 & 2	510421	G9350	Mod P/C	Add/remove venting points
511733	Scrubbers 101 & 102	510422	G9351	Mod P/C	Add/remove venting points
511735	Photolithographic System	503213	G8253	Mod P/C	Add tools
511736	Photolithographic System	460747	G2002	Mod P/C	Remove a tool
511737	Mc Gill Oxidizer	503214	G8254	Mod P/C	Add venting points
511738	Zink Oxidizer	503222	G8264	Mod P/C	Add venting points
511739	Storage Tank	503217	G8260	C/C	Add stored chemicals
511741	Storage Tank	503225	G8267	C/C	Add stored chemicals
511742	Storage Tank	460729	G1995	C/C	Change stored chemical & throughput

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT					Page	5 of 10
<i>ENGINEERING & COMPLIANCE</i>					A/Ns	511730 et al
APPLICATION PROCESSING AND CALCULATIONS					Processed By	KH
					Checked By	
					Date	8/7/10
511744	Storage Tank	460730	G1996	C/C	Change stored chemical & throughput	
511745	Storage Tank	460728	G1994	C/C	Change stored chemical & throughput	
511746	Wafer Etching And Stripping Line 3	None	None	P/C	New	

Additional details:

APPLICATION NO. 511730: I C Manufacturing

Chemicals	Usage changed, lb/month	
	From	To
PH3	12	20
SiH4	3,100	2,000
BF3	2	5
CHF3	20	30
Cl2	40	100
SF6	20	30
NH3	12	20

APPLICATION NO. 511731: I C Manufacturing

Chemicals	Usage changed, lb/month	
	From	To
PH3	3	5
SiH4	120.5	150
CHF3	99	120
Cl2	155	250
SF6	160	180
POCl3	13	30
C8H20SiO4	40	200
NF3	26	40

APPLICATION NO. 511739: T-517

Add chemicals: Ethylene glycol monobutyl ether, hydrazine

APPLICATION NO. 511741: T-14

Add chemicals: Ethylene glycol monobutyl ether, hydrazine, iodine

APPLICATION NO. 511742: T-151

Change stored chemical from Poly Etch to Buffered Oxide Etch
 Change throughput limit from 11,348 to 3,000 gallons per month

APPLICATION NO. 511744: T-155

Change stored chemical from Poly Etch to HCl
 Change throughput limit from 11,348 to 1,000 gallons per month

APPLICATION NO. 511745: T-141

Change stored chemical from Poly Etch to dilute HF (0.47% HF)
 Change throughput limit from 8,648 to 30,000 gallons per month

PROCESS DESCRIPTION

The equipment is for semiconductor device manufacturing. Oxidizers are used for VOC control and wet scrubbers are used for PM control. In addition, resin adsorbers are used to control arsine emissions from ion implanters that use arsine.

CALCULATIONS

Emissions are as specified below. See ATTACHMENTS for more details.

A/N 511730

I C Manufacturing

	NH ₃		PM10	
	Uncontrolled	Controlled	Uncontrolled	Controlled
lb/hr	0.19	0.19	0.49	0.02
lb/day	4.67	4.67	12	0.60
lb/yr	-	1,698.67	-	217.52

A/N 511731

I C Manufacturing

	PM10	
	Uncontrolled	Controlled
lb/hr	0.98	0.05
lb/day	24	1.17
lb/yr	-	424.20

A/N 511735

Photolithographic System

	VOC	
	Uncontr.	Contr.
lb/hr	5.61	0.28
lb/day	134.65	6.73
lb/yr	-	2,450.61

A/N 511736

Photolithographic System

	VOC	
	Uncontr.	Contr.
lb/hr	22.42	0.29
lb/day	538.05	6.99
lb/yr	-	2,546.05

A/N 511737 McGill Oxidizer

The combined fuel limit for McGill and John Zink oxidizers remains unchanged (100% load of one of the two oxidizers with the same heat input rating). Since emissions for John Zink oxidizer operated at full load are recorded under A/N 511738 (John Zink oxidizer), the 30-day average emissions from McGill oxidizer (A/N 511737) should be recorded as zeros.

	ROG	NO _x	SO _x	CO	PM10
lb/hr	0.03	0.24	0	0.09	0.01
lb/day	0.72	5.76	0.00	2.16	0.24
lb/yr	109.00	1036.00	12.00	411.00	87.36

A/N 511738 Zink Oxidizer

	ROG	NO _x	SO _x	CO	PM10
lb/hr	0.03	0.24	-	0.09	0.01
lb/day	0.72	5.76	-	2.16	0.24
lb/yr	109.00	1,036.00	12.00	411.00	87.36

A/N 511739 T-517

	PM10		VOC	
	Uncontr.	Controlled	Uncontr.	Contr.
lb/hr	2.16E-04	1.08E-05	0.03	0.002
lb/day	0.0052	2.60E-04	0.76	0.05
lb/yr		0.09		16.98

A/N 511741 T-14

	PM10		VOC	
	Uncontr.	Contr.	Uncontr.	Contr.
lb/hr	0.03	0.0016	0.03	0.002
lb/day	0.78	0.04	0.70	0.04
lb/yr		14.28		15.71

A/N 511742 T-151

	PM10	
	Uncontr.	Contr.
lb/hr	4.67E-04	2.34E-05
lb/day	0.0112	5.60E-04
lb/yr		0.20

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING & COMPLIANCE

APPLICATION PROCESSING AND CALCULATIONS

Page 8 of 10
 A/Ns 511730 et al
 Processed By KH
 Checked By
 Date 8/7/10

A/N 511744 T-155

	PM10	
	Uncontr.	Contr.
lb/hr	8.77E-04	4.38E-05
lb/day	0.0219	1.05E-03
lb/yr		0.38

A/N 511745 T-141

	PM10	
	Uncontr.	Contr.
lb/hr	2.35E-05	1.17E-06
lb/day	0.0006	2.82E-05
lb/yr		0.01

A/N 511746 Wafer Etching And Stripping Line 3

		PM	PM10	VOC	HF	H ₂ SO ₄	IPA
lb/hr	Uncontr.	0.0606	0.06	0.09	0.0473	0.01	0.09
	Contr.	0.00303	0.0029	0.091	0.00237	0.0007	0.091
lb/day	Uncontr.	1.454	1.396	2.18	1.14	0.319	2.18
	Contr.	0.07	0.07	2.18	0.0568	0.016	2.18
lb/yr			25.41	792.32	20.67	5.80	792.32

Table 1

Project PM10 Emission Increase

Applications		PM10 Emissions, lb/day			Remarks
Current	Previous	Current	Previous	Increases	
511730	510417	0.60	0.38	0.22	
511731	504815	1.17	0.89	0.28	
511732	510421	-	-	-	PM control equipment
511733	510422	-	-	-	PM control equipment
511735	503213	-	-	-	VOC source
511736	460747	-	-	-	VOC source
511737	503214	0.24	-	0.24	PM10 recorded with A/N 511738
511738	503222	0.24	0.24	-	
511739	503217	0.0003	0.0002	0.00002	
511741	503225	0.04	0.19	-	
511742	460729	0.0006	0.0027	-	
511744	460730	0.0011	0.0027	-	
511745	460728	0.00003	0.0003	-	
511746	None	0.07	-	0.07	
Total project impact				0.80	

RULE EVALUATION

Rule 212:

(c) (1): Emissions near a school

The equipment is not located within 1000 feet from the outer boundary of a school. (The nearest school, Mountain View Christian School, is 3168 feet from the facility). The equipment is not subject to the public notice requirements of subdivision (c).

River Springs Charter School, located at 43466 Business Park Dr., CA 92590, is listed 0.1 mile from the facility. However, a check on the maps shows that the distance is actually more than 0.3 mile. Also, further investigation reveals that River Springs Charter School, located at 43466 Business Park Dr., CA 92590 is only an administration building, and there is no class held at the location.

(c) (2): On-site emission increases exceeding the daily maximums

The emission increases do not exceed any of the daily maximums specified in subdivision (g) of this rule. The equipment is not subject to the public notice requirements of subdivision (c).

(c) (3): Emissions of toxic air contaminants

Results of Rule 1401 analyses show that MICR is less 1 in a million and HIs are less than 1. The equipment is not subject to the public notice requirements of subdivision (c).

(g) Emission increases exceeding the daily maximums

The emission increases do not exceed any of the daily maximums specified in subdivision (g) of this rule. The equipment is not subject to the public notice requirements specified in subdivision (g).

Rule 401 - Visible Emissions:

Based on experience with this type of equipment, compliance with this rule is expected.

Rule 402 - Nuisances:

Nuisance problems due to the equipment operation are unlikely.

Rule 1164 - Semiconductor Manufacturing:

VOC emissions from photoresist operations are controlled by over 90%. Complies.

Regulation XIII: New Source Review

BACT:

Scrubbers for PM control are BACT for the equipment. Complies.

Modeling:

Currently, no modeling is required for VOC. The PM10 emissions are lower than the limit in Table A-1 of Rule 1303. No further evaluation is necessary.

Offsets:

CO:

CO is in attainment. See Rule 1703 evaluation.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	Page	10 of 10
<i>ENGINEERING & COMPLIANCE</i>	A/Ns	511730 et al
APPLICATION PROCESSING AND CALCULATIONS	Processed By	KH
	Checked By	
	Date	8/7/10

VOC:

The facility has a VOC facility limit of 1,830 pounds in one calendar month. This limit is not expected to be exceeded with the new installation, modification and change of conditions. Reported VOC emissions from January 2007 to December 2008 show that VOC emissions from this facility were less than 1,460 lbs/month. Reported VOC emissions for 2009 show that VOC from this facility were less than 540 lbs/month. The reason for the decrease was from the removal of several VOC emitting tools. With the new tools which are in the process of being installed, VOC emissions will be increased. The expected VOC emissions from the facility after the new tools are installed, however, will be below the 1,830 lbs/month limit.

The facility VOC potential to emit is 61 lb/day (=1,830 lb/month/30 days/month). However, the company has removed some permit units in the last few years. Since the permits associated with those permit units have been inactivated, the associated VOC emissions have been removed. The facility VOC NSR account currently shows only 12 lb/day. The account will be fixed to show the correct PTE of 61 lb/day.

NOx/SOx

There is no emission increase due to the modification. No external offsets are required.

PM10

The facility PTE is less than the amount(s) in Table A of Rule 1304. No external offsets are required.

Rule 1401:

MICR is less than 1 in a million and HI is less than 1. Complies.

Rule 1703 - PSD Analysis:

There is no CO emission increase due the modification, all requirements of Regulation XVII - Prevention of Significant Deterioration - are not applicable.

DISCUSSIONS

Exhaust flow rates: Flow rate capacities of the scrubbers and oxidizers are adequate to accommodate the additional venting points.

Based on information submitted with the applications and the above evaluation, it is expected that the equipment will operate in compliance with all the applicable rules and regulations of the District.

RECOMMENDATIONS:

Issue permits subject to the permit conditions as stated in Section D.

**ATTACHMENT
I C Manufacturing**

Previous:

510417 G9347

A/N: 511730

Breakdown Information (From 2006 IPCC
Guidelines for National Greenhouse Gas
Inventories)

Given:

	Process	MW	Through Vector	lb/month	Used Ui	Transformed		Reacted to Form Acids
						To	Amount	
AsH ₃		77.95						
PH ₃	Diffusion	34.00	100%	5				
SiH ₄	Diffusion	32.12	Poly	30				
SiH ₄	Diffusion	32.12	LTO	20				
SiH ₂ Cl ₂		101.01		10				
BF ₃		67.81		5				
BCl ₃		117.169		4				
C ₂ F ₆	Etch	138.01		30	0.6	CF4	0.4	0.2
CHF ₃	Etch	70.0141		30	0.6	CF4	0.07	0.53
CF ₄	Etch	88.00		10	0.3			0.3
Cl ₂		70.906		100				
SF ₆	Etch	146.05		30	0.8			0.8
HBr		80.9119		22				
SiCl ₄		169.90						
NH ₃		17.03		140				
N ₂ O								
NF ₃	Etch	71.0019		20	0.8			0.8
Metex LSB								
POCl ₃	Diffusion	153.33		8				
Isopropanol								
Acetone								
CH ₃ CCl ₃	(TCA)	133.40		45				
CHCl ₃		119.38						

C₈H₂₀SiO₄ (TEOS) 208.33 Diffusion 2000

Molecular weight (MW)

	AsH3	PH3	SiH4	BF3	CF4	POCl3	H3PO4	SiO2	H3BO3
MW	77.95	34.00	32.12	67.81	88.00	153.3322	98	60.08	61.83

	HCl	H ₂ SO ₄	BCl3	C2F6	SF6	HBr	NH3	HF	CHCl3
MW	36.46	98.07	303.33	138.01	146.05	80.9119	17.03	20.01	119.3779

Operating schedule:

hrs/day	24 hrs/day
days/wk	7 days/wk
wks/yr	52 wks/yr

**ATTACHMENT
I C Manufacturing**

Main scrubber control efficiencies

(Information from HEE Environmental Engineering)

HCl	95%
HF	95%
H ₂ SO ₄	95%
H ₃ PO ₄	95%
HBr	95%
H ₃ BO ₃	95%
SiO ₂	90%

Scrubber NH₃ control efficiency (Assumed) 0%

Diffusion furnaces integrated filters control efficiency:

SiO ₂	98%
P ₂ O ₅	0%

PM10 in PM 96%

Exhaust flow rate: 60,000 cfm

Molecular weights:

H ₂ SO ₄	98.07 lb/lbmole
(NH ₄) ₂ SO ₄	132.13 lb/lbmole
HCl	36.46 lb/lbmole
NH ₄ Cl	53.49 lb/lbmole
H ₃ PO ₄	98.00 lb/lbmole
(NH ₄) ₃ PO ₄	149.09 lb/lbmole

Note: Arsine emissions will be calculated separately.

Computations: Except where indicated, all chemicals are used up in the process.

NH₃ emissions:

NH₃ emissions:

lb/day

Uncontrolled	140 lb/month/30 days/month =	4.67 lb/day
Controlled	4.67 lb/day*(1-0) =	4.67 lb/day

lb/hr

Uncontrolled	4.67 lb/day/24 hrs/day =	0.19 lb/hr
Controlled	4.67 lb/day/24 hrs/day =	0.19 lb/hr

lb/yr

4.67 lb/day*7 days/wk*52 wks/yr = 1,698.67 lb/yr

NH₃ concentration, ppm (in exhaust)

0.19 lb/hr/60 min/hr/60000 cfm*10⁶ = 0.05 ppm

Note: This ammonia concentration is at the exhaust of the wet scrubber. At ground level, the concentration is much lower. Even at the wet scrubber exhaust, the ammonia concentration is well below the ACGIH (American Conference of Governmental Industrial Hygienist) threshold level of 25 ppm.

NH₃ Summary:

	NH ₃	
	Uncontrolled	Controlled
lb/hr	0.19	0.19
lb/day	4.67	4.67
lb/yr	-	1,698.67

**ATTACHMENT
I C Manufacturing**

Emissions from other chemicals:

Emissions, lb/hr:

H3PO4 from PH3

The ratio 1/1 means 1 mole of H3PO4 is created per mole of PH3

PM

Uncontrolled	With diffusion furnaces integrated filters control efficiency being counted		
	5 lb/month/30 days/month/24 hrs/day*(1/1)*98.00 lb/lbmole/34.00 lb/lbmole*(1-0) =		0.02 lb/hr
Controlled		0.02 lb/hr*(1-0.95) =	0.0010 lb/hr

PM10

Uncontrolled		0.02 lb/hr*0.96 =	0.0192 lb/hr
Controlled		0.0010 lb/hr*0.96 =	0.00096 lb/hr

SiO2 from SiH4 Poly

PM

Uncontrolled	With diffusion furnaces integrated filters control efficiency being counted		
	30 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/32.12 lb/lbmole*(1-0.98) =		0.002 lb/hr
Controlled		0.002 lb/hr*(1-0.9) =	0.0002 lb/hr

PM10

Uncontrolled		0.002 lb/hr*0.96 =	0.001 lb/hr
Controlled		0.0002 lb/hr*0.96 =	0.0001 lb/hr

SiO2 from SiH4 LTO

Uncontrolled	With diffusion furnaces integrated filters control efficiency being counted		
	20 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/32.12 lb/lbmole*(1-0.98) =		0.001 lb/hr
Controlled		0.001 lb/hr*(1-0.9) =	0.0001 lb/hr

PM10

Uncontrolled		0.001 lb/hr*0.96 =	0.001 lb/hr
Controlled		0.0001 lb/hr*0.96 =	0.0001 lb/hr

SiO2 from SiH2Cl2

PM

Uncontrolled	With diffusion furnaces integrated filters control efficiency being counted		
	10 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/101.01 lb/lbmole*(1-0.98) =		0.00017
Controlled		0.00017 lb/hr*(1-0.9) =	0.00002

PM10

Uncontrolled		0.00017 lb/hr*0.96 =	0.0002
Controlled		0.00002 lb/hr*0.96 =	0.00002

HCl from SiH2Cl2

PM

Uncontrolled	10 lb/month/30 days/month/24 hrs/day*(2/1)*36.46 lb/lbmole/101.01 lb/lbmole =		0.01
Controlled		0.01 lb/hr*(1-0.95) =	0.0005

PM10

Uncontrolled		0.01 lb/hr*0.96 =	0.01
Controlled		0.001 lb/hr*0.96 =	0.0005

H3BO3 from BF3

PM

Uncontrolled	5 lb/month/30 days/month/24 hrs/day*(1/1)*61.83 lb/lbmole/67.81 lb/lbmole =		0.006 lb/hr
Controlled		0.0063 lb/hr*(1-0.95) =	0.0003 lb/hr

PM10

Uncontrolled		0.0063 lb/hr*0.96 =	0.006 lb/hr
Controlled		0.0003 lb/hr*0.96 =	0.0003 lb/hr

**ATTACHMENT
I C Manufacturing**

HF from BF3			
PM			
Uncontrolled	5 lb/month/30 days/month/24 hrs/day*(3/1)*20.01 lb/lbmole/67.81 lb/lbmole =		0.006 lb/hr
Controlled		0.0061 lb/hr*(1-0.95) =	0.00031 lb/hr
PM10			
Uncontrolled		0.0061 lb/hr*0.96 =	0.006 lb/hr
Controlled		0.00031 lb/hr*0.96 =	0.00030 lb/hr
H3BO3 from BC13			
PM			
Uncontrolled	4 lb/month/30 days/month/24 hrs/day*(3/1)*61.83 lb/lbmole/117.17 lb/lbmole =		0.003 lb/hr
Controlled		0.003 lb/hr*(1-0.95) =	0.0001 lb/hr
PM10			
Uncontrolled		0.003 lb/hr*0.96 =	0.003 lb/hr
Controlled		0.003 lb/hr*0.96 =	0.0001 lb/hr
HCl from BC13			
PM			
Uncontrolled	4 lb/month/30 days/month/24 hrs/day*(3/1)*36.46 lb/lbmole/117.17 lb/lbmole =		0.0052 lb/hr
Controlled		0.0052 lb/hr*(1-0.95) =	0.0003 lb/hr
PM10			
Uncontrolled		0.0052 lb/hr*0.96 =	0.005 lb/hr
Controlled		0.005 lb/hr*0.96 =	0.0002 lb/hr
HF from C2F6			
PM			
Uncontrolled	30 lb/month/30 days/month/24 hrs/day*(6/1)*20.01 lb/lbmole/138.01 lb/lbmole*0.2 =		0.0072
Controlled		0.0072 lb/hr*(1-0.95) =	0.0004
PM10			
Uncontrolled		0.0072 lb/hr*0.96 =	0.007
Controlled		0.007 lb/hr*0.96 =	0.0003
HF from CHF3			
PM			
Uncontrolled	30 lb/month/30 days/month/24 hrs/day*(3/1)*20.01 lb/lbmole/70.01 lb/lbmole*0.53 =		0.019 lb/hr
Controlled		0.019 lb/hr*(1-0.95) =	0.00095 lb/hr
PM10			
Uncontrolled		0.019 lb/hr*0.96 =	0.018 lb/hr
Controlled		0.0009 lb/hr*0.96 =	0.00091 lb/hr
HF from CF4			
PM			
Uncontrolled	10 lb/month/30 days/month/24 hrs/day*(4/1)*20.01 lb/lbmole/88.00 lb/lbmole*0.3 =		0.004 lb/hr
Controlled		0.004 lb/hr*(1-0.95) =	0.0002 lb/hr
PM10			
Uncontrolled		0.004 lb/hr*0.96 =	0.004 lb/hr
Controlled		0.0002 lb/hr*0.96 =	0.00018 lb/hr
HCl from Cl2			
PM			
Uncontrolled	100 lb/month/30 days/month/24 hrs/day*(2/1)*36.46 lb/lbmole/70.91 lb/lbmole =		0.14 lb/hr
Controlled		0.14 lb/hr*(1-0.95) =	0.007 lb/hr

**ATTACHMENT
I C Manufacturing**

PM10			
Uncontrolled		$0.14 \text{ lb/hr} * 0.96 =$	0.137 lb/hr
Controlled		$0.007 \text{ lb/hr} * 0.96 =$	0.0069 lb/hr
HF from SF6			
PM			
Uncontrolled	30 lb/month/30 days/month/24 hrs/day*(6/1)*20.01 lb/lbmole/146.05 lb/lbmole*0.8 =		0.027 lb/hr
Controlled		$0.027 \text{ lb/hr} * (1-0.95) =$	0.0014 lb/hr
PM10			
Uncontrolled		$0.027 \text{ lb/hr} * 0.96 =$	0.026 lb/hr
Controlled		$0.0014 \text{ lb/hr} * 0.96 =$	0.0013 lb/hr
H2SO4 from SF6			
PM			
Uncontrolled	30 lb/month/30 days/month/24 hrs/day*(1/1)*98.07 lb/lbmole/146.05 lb/lbmole*0.8 =		0.022 lb/hr
Controlled		$0.0224 \text{ lb/hr} * (1-0.95) =$	0.00112 lb/hr
PM10			
Uncontrolled		$0.0224 \text{ lb/hr} * 0.96 =$	0.021 lb/hr
Controlled		$0.001119 \text{ lb/hr} * 0.96 =$	0.0011 lb/hr
HBr from HBr			
PM			
Uncontrolled	22 lb/month/30 days/month/24 hrs/day*(1/1)*80.91 lb/lbmole/80.91 lb/lbmole =		0.031 lb/hr
Controlled		$0.031 \text{ lb/hr} * (1-0.95) =$	0.0015 lb/hr
PM10			
Uncontrolled		$0.031 \text{ lb/hr} * 0.96 =$	0.029 lb/hr
Controlled		$0.0015 \text{ lb/hr} * 0.96 =$	0.0015 lb/hr
HF from NF3			
PM			
Uncontrolled	20 lb/month/30 days/month/24 hrs/day*(3/1)*20.01 lb/lbmole/71.00 lb/lbmole*0.8 =		0.0188 lb/hr
Controlled		$0.0188 \text{ lb/hr} * (1-0.95) =$	0.0009 lb/hr
PM10			
Uncontrolled		$0.0188 \text{ lb/hr} * 0.96 =$	0.018 lb/hr
Controlled		$0.0009 \text{ lb/hr} * 0.96 =$	0.0009 lb/hr
H3PO4 from POCl3			
PM			
Uncontrolled	1/1 means 1 mole of H3PO4 is produced per mole of POCl3 8 lb/month/30 days/month/24 hrs/day*(1/1)*98.00 lb/lbmole/153.33 lb/lbmole =		0.007 lb/hr
Controlled		$0.007 \text{ lb/hr} * (1-0.95) =$	0.00036 lb/hr
PM10			
Uncontrolled		$0.007 \text{ lb/hr} * 0.96 =$	0.007 lb/hr
Controlled		$0.00036 \text{ lb/hr} * 0.96 =$	0.0003409 lb/hr
HCl from POCl3			
PM			
Uncontrolled	8 lb/month/30 days/month/24 hrs/day*(3/1)*36.46 lb/lbmole/153.33 lb/lbmole =		0.008 lb/hr
Controlled		$0.008 \text{ lb/hr} * (1-0.95) =$	0.00040 lb/hr
PM10			
Uncontrolled		$0.008 \text{ lb/hr} * 0.96 =$	0.008 lb/hr
Controlled		$0.00040 \text{ lb/hr} * 0.96 =$	0.00038 lb/hr

**ATTACHMENT
I C Manufacturing**

HCl from CH₃CCl₃

PM

Uncontrolled 45 lb/month/30 days/month/24 hrs/day*(3/1)*36.46 lb/lbmole/133.40 lb/lbmole = 0.051 lb/hr
 Controlled 0.051 lb/hr*(1-0.95) = 0.00256 lb/hr

PM10

Uncontrolled 0.051 lb/hr*0.96 = 0.049 lb/hr
 Controlled 0.00256 lb/hr*0.96 = 0.00246 lb/hr

SiO₂ from C₈H₂₀SiO₄

PM

Uncontrolled 2000 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/208.33 lb/lbmole*(1-0.98) = 0.016 lb/hr
 Controlled 0.016 lb/hr*(1-0.95) = 0.0008 lb/hr

PM10

Uncontrolled 0.016 lb/hr*0.96 = 0.0154 lb/hr
 Controlled 0.0008 lb/hr*0.96 = 0.0008 lb/hr

		PM		PM10		
Emission	From	Uncontr.	Contr.	Uncontr.	Contr.	
lb/hr	H ₃ PO ₄	PH ₃	0.020	0.0010	0.019	0.00096
	SiO ₂	SiH ₄ Poly	0.002	0.0002	0.001	0.00015
	SiO ₂	SiH ₄ LTO	0.001	0.0001	0.001	0.00010
	SiO ₂	SiH ₂ Cl ₂	0.0002	0.00002	0.0002	0.000016
	HCl	SiH ₂ Cl ₂	0.01	0.00050	0.0096	0.00048
	H ₃ BO ₃	BF ₃	0.006	0.0003	0.006	3.04E-04
	HF	BF ₃	0.006	0.0003	0.006	2.95E-04
	H ₃ BO ₃	BCl ₃	0.003	0.000	0.003	0.0001
	HCl	BCl ₃	0.005	0.0003	0.005	0.0002
	HF	C ₂ F ₆	0.007	0.000	0.01	0.000
	HF	CHF ₃	0.019	0.0009	0.018	9.09E-04
	HF	CF ₄	0.004	0.0002	0.004	1.82E-04
	HCl	Cl ₂	0.143	0.007	0.137	0.0069
	HF	SF ₆	0.02740	0.0014	2.63E-02	0.0013
	H ₂ SO ₄	SF ₆	0.022	0.0011	2.15E-02	0.0011
	HBr	HBr	0.03	0.002	0.03	0.0015
	HF	NF ₃	0.02	0.001	0.02	0.0009
	H ₃ PO ₄	POCl ₃	0.007	0.0004	0.007	0.0003
	HCl	POCl ₃	0.008	0.0004	0.008	0.00038
	HCl	CH ₃ CCl ₃	0.05	0.0026	0.05	0.0025
	HCl	CHCl ₃	-	-	-	-
	SiO ₂	C ₈ H ₂₀ SiO ₄	0.016	0.0008	0.015	0.0008
		Total	0.39	0.02	0.38	0.02
lb/day				9.02	0.45	
lb/yr					165.37	

**ATTACHMENT
I C Manufacturing**

PM10 emission increase due to the reactions of NH₃ with H₂SO₄, HCl, and H₃PO₄ in the exhaust to form salts (NH₄SO₄, NH₄Cl, NH₄PO₄), sources of PM10: Assume 100% conversion. Since acids are limited agents, amounts of salts will depend on the available acids.

Conversion from H₂SO₄ to (NH₄)₂SO₄ will cause the following emission increases:

PM:			
	Uncontr.	0.0224 lb/hr*(132.13/98.07-1) =	0.01 lb/hr
	Contr.	0.0011 lb/hr*(132.13/98.07-1) =	0.0004 lb/hr
PM10			
	Uncontr.	0.0215 lb/hr*(132.13/98.07-1) =	0.007 lb/hr
	Contr.	0.0011 lb/hr*(132.13/98.07-1) =	0.0004 lb/hr

Conversion from HCl to NH₄Cl will cause the following emission increases:

PM:			
	Uncontr.	(0.01+0.005+0.143+0.008+0.051+0) lb/hr*(53.49/36.46-1) =	0.10 lb/hr
	Contr.	(0.001+0.0003+0.0071+0.0004+0.0026+0) lb/hr*(53.49/36.46-1) =	0.005 lb/hr
PM10			
	Uncontr.	(0.01+0.005+0.137+0.008+0.049+0) lb/hr*(53.49/36.46-1) =	0.10 lb/hr
	Contr.	(0.00+0.0002+0.0069+0.0004+0.0025+0) lb/hr*(53.49/36.46-1) =	0.005 lb/hr

Conversion from H₃PO₄ to (NH₄)₃PO₄ will cause the following emission increases:

PM:			
	Uncontr.	(0.020+0.007) lb/hr*(149.09/98.00-1) =	0.01 lb/hr
	Contr.	(0.001+0.0004) lb/hr*(149.09/98.00-1) =	0.0007 lb/hr
PM10			
	Uncontr.	(0.019+0.007) lb/hr*(149.09/98.00-1) =	0.01 lb/hr
	Contr.	(0.001+0.0003) lb/hr*(149.09/98.00-1) =	0.0007 lb/hr

Subtotal increases due to NH₃ & acids reactions

PM:			
	Uncontr.	(0.008+0.101+0.014) lb/hr =	0.12 lb/hr
	Contr.	(0.0004+0.005+0.0007) lb/hr =	0.006 lb/hr
PM10			
	Uncontr.	(0.007+0.097+0.014) lb/hr =	0.12 lb/hr
	Contr.	(0.0004+0.005+0.0007) lb/hr =	0.006 lb/hr

Total emission increases (Including salts formed from NH₃ & acids reactions)

PM:			
	Uncontr.	lb/hr	0.51 lb/hr
	Contr.	lb/hr	0.03 lb/hr
PM10			
	Uncontr.	lb/hr	0.49 lb/hr
		lb/day	0.49 lb/hr*24 hrs/day = 11.87 lb/day
	Contr.	lb/hr	0.02 lb/hr
		lb/day	0.02 lb/hr*24 hrs/day = 0.60 lb/day
		lb/yr	0.60 lb/day*7 days/wk*52 wks/yr = 217.52 lb/yr

**ATTACHMENT
I C Manufacturing**

Rule 1401 chemicals

For Rule 1401 analysis, we will assume there are no reactions between NH₃ and acids (Conservative).

(lb/hr from above)

NH ₃	lb/hr		0.19 lb/hr
	lb/yr		1,698.67 lb/yr
H ₃ PO ₄	lb/hr	0.0010+0.0004 =	0.001 lb/hr
	lb/yr	0.001 lb/hr*24 hrs/day*7 days/wk*52 wks/yr =	11.85 lb/yr
HCl	lb/hr	0.0005+0.0003+0.007+0.0004+0.0026+0.0000 =	0.011 lb/hr
	lb/yr	0.011 lb/hr*24 hrs/day*7 days/wk*52 wks/yr =	94.88 lb/yr
HF	lb/hr	0.00031+0.00036+0.00095+0.00019+0.0014+0.001 =	0.0041 lb/hr
	lb/yr	0.0041 lb/hr*24 hrs/day*7 days/wk*52 wks/yr =	35.95 lb/yr
H ₂ SO ₄	lb/hr		0.00112 lb/hr
	lb/yr	0.0011 lb/hr*24 hrs/day*7 days/wk*52 wks/yr =	9.78 lb/yr

NSR & AEIS Inputs:

	PM	PM10
lb/hr		
Uncontr.	0.51	0.49
Contr.	0.03	0.02
lb/day		
Uncontr.		12
Contr.		0.60
lb/yr (Contr.)		217.52

Permit limits:

PH ₃		5 lb/month
SiH ₄	30+20 =	50 lb/month
SiH ₂ Cl ₂		10 lb/month
BF ₃		5 lb/month
BCl ₃		4 lb/month
C ₂ F ₆		30 lb/month
CHF ₃		30 lb/month
CF ₄		10 lb/month
Cl ₂		100 lb/month
SF ₆		30 lb/month
HBr		22 lb/month
NH ₃		140 lb/month
NF ₃		20 lb/month
POCl ₃		8 lb/month
CH ₃ CCl ₃		45 lb/month
C ₈ H ₂₀ SiO ₄		2,000 lb/month

**Arsine Emissions
4 Ion Implanters Using Arsine**

<u>Given:</u>	A/N 511730
1 Arsine flow rate to implanter	0.0138 L/min
2 Operating schedule:	
a Hours/day	24
b Days/week	7
c Weeks/year	52
3 Sensor analyzing time (collecting sample & analyzing) (6 times: 3 at breakthrough at main canister and 3 at breakthrough at standby canister, 60 sec each)	360 sec
4 Time period between the time sensor detects break through at outlet of main canister and the time that effluent from implanter is completely switched to standby canister (Interlocks for automatic switching are required) - 3 times at 30 seconds each.	90 sec
5 Time period between the time sensor detects break through at outlet of standby canister and the time that arsine flow to implanter is shut down (Interlocks for automatic shutdown are required) - 3 times at 30 seconds each.	90 sec
6 Scrubber replacements each year	2
7 Number of scrubbers in the permit unit	4
Molecular weights:	
Arsine	77.95 lb/lbmole
Arsenic	74.92 lb/lbmole
Ionization efficiency	90%
Arsenic in arsine	0.96 lb/lb
Implant efficiency	45%
Control efficiency:	99%
Ideal gas molar volume @ 60 F & 1 atmosphere	379.49 ft ³ /lbmole
Conversion from liters to ft ³ :	0.035 ft ³ /L
<u>Computations:</u>	
<u>For 1 resin canister:</u>	
<u>(a) During normal operation:</u>	
Arsine usage:	
0.0138 L/min*0.035 cf/L*60 min/hr*24 hrs/day*7 days/wk*52 wks/yr/379.49 cf/lbmole*77.95 lb/lbmole =	52.4 lb/yr
Arsenic emissions:	
Uncontrolled	52.43 lb/yr*0.96 lb arsenic/lb arsine *((1-0.9)+0.9*(1-0.45)) = 29.98 lb/yr
	29.98 lb/yr/52 wks/yr/7 days/wk/24 hrs/day = 0.00343 lb/hr
Controlled	29.98 lb/yr*(1-0.99) = 0.300 lb/yr
	0.00343 lb/hr*(1-0.99) = 3.43E-05 lb/hr
<u>(b) During other periods:</u>	
(Switching from main canister to standby canister and shutdown)	
Amount of time when arsine is not controlled: (360 sec+90 sec+90 sec)*2 times/yr =	1080 sec/yr
Arsine used:	
0.0138 L/min/60 sec/min*1080 sec/yr*0.035 cf/L/379.49 cf/lbmole*77.95 lb/lbmole =	0.00180 lb/yr
Arsenic emissions:	0.0018 lb/yr*0.96 lb arsenic/lb arsine*((1-0.9)+0.9*(1-0.45)) = 0.00103 lb/yr
<u>(c) Total arsenic emissions:</u>	
	0.3 lb/yr+0.00103 lb/yr = 0.301 lb/yr
	0.301 lb/yr/52 wks/yr/7 days/wk/24 hrs/day = 3.444E-05 lb/hr

Arsine usage $0.0138 \text{ L/min} * 60 \text{ min/hr} * 24 \text{ hrs/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 7,227.55 \text{ L/yr}$
 $7227.55 \text{ L/yr} * 0.035 \text{ cf/L} / 379.49 \text{ cf/lbmole} * 77.95 \text{ lb/lbmole} = 52.43 \text{ lb/yr}$
 Overall control efficiency: $1 - 0.301 / 29.98 = 98.997\%$

For a maximum of 4 canisters:

Total arsenic emissions: $0.301 \text{ lb/yr-canister} * 4 \text{ canisters} = 1.203 \text{ lb/yr}$
 $1.203 \text{ lb/yr} / 52 \text{ wks/yr} / 7 \text{ days/wk} / 24 \text{ hrs/day} = 1.38E-04 \text{ lb/hr}$

Results of risk analysis:

	Residential	Commercial
MICR	9.49E-07	3.49E-07
HIA	6.67E-03	
HIC	8.07E-03	

Arsine flow rate limit (per canister) 0.0138 L/min

NSR input: lb/hr * 10⁶

Uncontrolled arsenic emission $0.00343 \text{ lb/hr/can} * 4 \text{ cans} * 10^6 = 13,729$
 Controlled arsenic emission $0.000138 \text{ lb/hr} * 10^6 = 138$

Table A

Modeling emissions rate	1.000000	gr/sec
Modeling emissions rate	7.93	lb/hr
Modeling emissions rate	34.73	tons/yr
Max hr/dy	24	hr/day
Day per week	7	dy/wk
Week per year	52	wk/yr
MODELING RESULTS -MAX ONE HOUR		
Distance residence	1000.00	meter
Max. 1-hour Conc. Residence	43.140000	ug/m3
Annualized Conc. Residence	3.451200	ug/m3
Distance Commerical	50.00	meter
Max. 1-hour Conc. Commerical	79.650000	ug/m3
Annualized Conc. Commercial	6.372000	ug/m3

Annualized X/Q

X/Q Residential	0.099368645	(ug/m ³)/(tons/yr)
X/Q Commercial	0.183465753	(ug/m ³)/(tons/yr)

Max. X/Q

X/Q Residential	5.440433333	(ug/m ³)/(lbs/hr)
X/Q Commercial	10.04475	(ug/m ³)/(lbs/hr)

Table B (These values are needed to calculate cancer burden)

	Interpolation								
	Stack Height (ft): 50			Row: 3			X/Q for one-in-a-million		
	Residential			Industrial			near	actual	far
	near	actual	far	near	actual	far	near	actual	far
Distance	200.00	1000.00	1000.00	200.00	50.00	1000.00	200.00	2236.97	1000.00
X/Q - 1 hr conc ug/m3	9.09	43.14	5.52	9.09	79.65	5.52	9.09		5.52
X/Q Annualized (ug/m ³)/(tons/yr)	0.02	0.10	0.01	0.02	0.18	0.01	0.02		0.01

CONVERSION CALCULATOR FOR SCREEN MODELING INPUT (British to Metric Units)

SCREEN INPUT DATA - BRITISH UNITS

Actual exhausted rate	100.00	acfm
Temperature	900.00	degree F
Stack diameter	12.00	in
Stack height	20.00	ft
Modeling emissions rate	0.04	lb/hr

SCREEN INPUT DATA - METRIC UNITS

Temperature	755.222	degrees K
Stack diameter	0.305	meter
Stack area	0.073	square meter
Stack height	6.096	meter
Stack velocity	0.647	m/s
Modeling emissions rate	0.00504	gr/s

TIER 3 SCREENING RISK ASSESSMENT REPORT

A/N: 517730
 Fac: International Refrifer

517730
 International Refrifer

Application deemed complete date: 06/15/10

2. Tier 2 Data

MET Factor	1.00
4 hr	0.87
6 or 7 hrs	0.88

Dispersion Factors tables

3	For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.099368645	5.440433333
Commercial	0.183465753	10.04475

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

A/N: 511730

Application deemed complete date: 06/15/10

TIER 3 RESULTS

5a. MICR

MICR = CP (mg/(kg-day))⁻¹ * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1.E-6 * MP

Compound	Residential	Commercial
Ammonia		
Arsenic and arsenic compounds (inorganic)	9.95E-07	3.43E-07
Phosphoric acid		
Hydrogen chloride (hydrochloric acid)		
Hydrogen fluoride (hydrofluoric acid)		
Sulfuric acid (and oleum)		
Total	9.95E-07	3.43E-07
	PASS	PASS

No Cancer Burden, MICR < 1.0E-6

5b. Cancer Burden	no
X/Q for one-in-a-million:	
Distance (meter)	2236.97
Area (km ²):	1.57E+01
Population:	109989
Cancer Burden:	1.09E-01

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL			Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		6.83E-03	Pass	Pass
Developmental - DEV	6.55E-03	6.83E-03	Pass	Pass
Endocrine system - END			Pass	Pass
Eye	8.35E-04		Pass	Pass
Hematopoietic system - HEM			Pass	Pass
Immune system - IMM			Pass	Pass
Kidney - KID			Pass	Pass
Nervous system - NS		6.83E-03	Pass	Pass
Reproductive system - REP	6.55E-03		Pass	Pass
Respiratory system - RES	9.28E-04	2.80E-03	Pass	Pass
Skin			Pass	Pass

A/N: 511730

Application deemed complete date: 06/15/10

6a. Hazard Index Acute

$HIA = [Q(\text{lb/hr}) * (X/Q)_{\text{max}}] * AF / \text{Acute REL}$

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Ammonia				3.31E-04					3.31E-04	
Arsenic and arsenic compounds (inorganic)			3.55E-03					3.55E-03		
Phosphoric acid										
Hydrogen chloride (hydrochloric acid)				2.81E-05					2.81E-05	
Hydrogen fluoride (hydrofluoric acid)				9.33E-05					9.33E-05	
Sulfuric acid (and oleum)									5.07E-05	
Total			3.55E-03	4.52E-04				3.55E-03	5.03E-04	

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Ammonia				6.10E-04					6.10E-04	
Arsenic and arsenic compounds (inorganic)			6.55E-03					6.55E-03		
Phosphoric acid										
Hydrogen chloride (hydrochloric acid)				5.19E-05					5.19E-05	
Hydrogen fluoride (hydrofluoric acid)				1.72E-04					1.72E-04	
Sulfuric acid (and oleum)									9.37E-05	
Total			6.55E-03	8.35E-04				6.55E-03	9.28E-04	

6b. Hazard Index Chronic

$$HIC = [Q(\text{ton/yr}) * (X/Q) * MET * MP] / \text{Chronic REL}$$

Compound	HIC - Residential												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Ammonia													
Arsenic and arsenic compounds (inorganic)			3.80E-03	3.80E-03						3.80E-03		4.22E-04	
Phosphoric acid												8.41E-05	
Hydrogen chloride (hydrochloric acid)												5.24E-04	
Hydrogen fluoride (hydrofluoric acid)													
Sulfuric acid (and oleum)												4.86E-04	
Total			3.80E-03	3.80E-03						3.80E-03		1.52E-03	

6b. Hazard Index Chronic (cont.)

A/N: 511730

Application deemed complete date:

06/15/10

Compound	HIC - Commercial												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Ammonia												7.79E-04	
Arsenic and arsenic compounds (inorganic)			6.83E-03	6.83E-03						6.83E-03			
Phosphoric acid												1.55E-04	
Hydrogen chloride (hydrochloric acid)												9.67E-04	
Hydrogen fluoride (hydrofluoric acid)													
Sulfuric acid (and oleum)												8.97E-04	
Total			6.83E-03	6.83E-03						6.83E-03		2.80E-03	

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Scrubbers 1 & 2

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
 EMISSION RATE (G/S) = 1.00000
 STACK HEIGHT (M) = 15.2400
 STK INSIDE DIAM (M) = 1.8300
 STK EXIT VELOCITY (M/S) = 10.7660
 STK GAS EXIT TEMP (K) = 297.0000
 AMBIENT AIR TEMP (K) = 293.0000
 RECEPTOR HEIGHT (M) = .0000
 URBAN/RURAL OPTION = URBAN
 BUILDING HEIGHT (M) = .0000
 MIN HORIZ BLDG DIM (M) = .0000
 MAX HORIZ BLDG DIM (M) = .0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
 VOLUME FLOW RATE = 60000.000 (ACFM)

BUOY. FLUX = 1.190 M**4/S**3; MOM. FLUX = 95.732 M**4/S**2.

*** FULL METEOROLOGY ***

 *** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
25.	1.110	3	10.0	10.9	3200.0	18.80	5.55	5.08	NO
100.	60.22	3	4.0	4.4	1280.0	28.82	21.92	20.37	NO
200.	55.52	4	2.5	2.8	800.0	36.52	31.39	27.87	NO
300.	67.71	6	1.0	1.1	10000.0	40.30	31.99	21.18	NO
400.	79.46	6	1.0	1.1	10000.0	40.30	41.48	26.29	NO
500.	76.76	6	1.0	1.1	10000.0	40.30	50.72	31.07	NO
600.	69.51	6	1.0	1.1	10000.0	40.30	59.70	35.55	NO
700.	61.68	6	1.0	1.1	10000.0	40.30	68.43	39.76	NO
800.	54.53	6	1.0	1.1	10000.0	40.30	76.93	43.74	NO
900.	48.36	6	1.0	1.1	10000.0	40.30	85.19	47.51	NO
1000.	43.14	6	1.0	1.1	10000.0	40.30	93.24	51.10	NO
1100.	38.73	6	1.0	1.1	10000.0	40.30	101.09	54.53	NO
1200.	35.00	6	1.0	1.1	10000.0	40.30	108.74	57.82	NO
1300.	31.82	6	1.0	1.1	10000.0	40.30	116.21	60.97	NO
1400.	29.10	6	1.0	1.1	10000.0	40.30	123.51	64.01	NO
1500.	26.76	6	1.0	1.1	10000.0	40.30	130.64	66.95	NO
1600.	24.72	6	1.0	1.1	10000.0	40.30	137.62	69.79	NO
1700.	22.94	6	1.0	1.1	10000.0	40.30	144.45	72.54	NO
1800.	21.38	6	1.0	1.1	10000.0	40.30	151.14	75.20	NO
1900.	19.99	6	1.0	1.1	10000.0	40.30	157.70	77.80	NO
2000.	18.76	6	1.0	1.1	10000.0	40.30	164.13	80.32	NO
2100.	17.66	6	1.0	1.1	10000.0	40.30	170.45	82.78	NO

2200.	16.67	6	1.0	1.1	10000.0	40.30	176.64	85.18	NO
2300.	15.78	6	1.0	1.1	10000.0	40.30	182.73	87.52	NO
2400.	14.97	6	1.0	1.1	10000.0	40.30	188.71	89.81	NO
2500.	14.23	6	1.0	1.1	10000.0	40.30	194.59	92.05	NO
2600.	13.56	6	1.0	1.1	10000.0	40.30	200.37	94.24	NO
2700.	12.94	6	1.0	1.1	10000.0	40.30	206.06	96.39	NO
2800.	12.38	6	1.0	1.1	10000.0	40.30	211.66	98.49	NO
2900.	11.85	6	1.0	1.1	10000.0	40.30	217.17	100.56	NO
3000.	11.37	6	1.0	1.1	10000.0	40.30	222.60	102.59	NO
3500.	9.426	6	1.0	1.1	10000.0	40.30	248.62	112.23	NO
4000.	8.025	6	1.0	1.1	10000.0	40.30	272.97	121.16	NO
4500.	6.974	6	1.0	1.1	10000.0	40.30	295.91	129.51	NO
5000.	6.158	6	1.0	1.1	10000.0	40.30	317.62	137.39	NO
5500.	5.507	6	1.0	1.1	10000.0	40.30	338.28	144.85	NO
6000.	4.978	6	1.0	1.1	10000.0	40.30	358.01	151.96	NO
6500.	4.539	6	1.0	1.1	10000.0	40.30	376.91	158.76	NO
7000.	4.170	6	1.0	1.1	10000.0	40.30	395.07	165.29	NO
7500.	3.855	6	1.0	1.1	10000.0	40.30	412.56	171.58	NO
8000.	3.583	6	1.0	1.1	10000.0	40.30	429.46	177.65	NO
8500.	3.347	6	1.0	1.1	10000.0	40.30	445.80	183.52	NO
9000.	3.139	6	1.0	1.1	10000.0	40.30	461.65	189.22	NO
9500.	2.956	6	1.0	1.1	10000.0	40.30	477.03	194.75	NO
10000.	2.792	6	1.0	1.1	10000.0	40.30	491.99	200.13	NO
15000.	1.792	6	1.0	1.1	10000.0	40.30	623.68	247.64	NO
20000.	1.318	6	1.0	1.1	10000.0	40.30	733.37	287.46	NO
25000.	1.041	6	1.0	1.1	10000.0	40.30	829.19	322.41	NO
30000.	.8603	6	1.0	1.1	10000.0	40.30	915.28	353.93	NO
40000.	.7228	4	1.0	1.1	320.0	68.44	1552.30	1553.23	NO
50000.	.6427	4	1.0	1.1	320.0	68.44	1745.81	1750.07	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

418.	79.65	6	1.0	1.1	10000.0	40.30	43.25	27.23	NO
------	-------	---	-----	-----	---------	-------	-------	-------	----

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	46.36	3	10.0	10.9	3200.0	18.80	10.95	10.07	NO
1000.	43.14	6	1.0	1.1	10000.0	40.30	93.24	51.10	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	79.65	418.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

**Resin Adsorber
Main Canister**

Resin volume canister	(Manufacturer's data)	(32 gallons)	121 L
Resin capacity	(Manufacturer's data)		1.12 gmole/L
Molecular weights:			
Arsine			77.95 g/gmole
Arsenic			74.92 g/gmole
Arsenic in arsine		74.92/77.95 =	96%
Uncontrolled arsenic	(Arsine Emissions - 4 Ion Implanter Using Arsine)		0.003432 lb/hr
Conversion from g to lb			0.0022046 lb/g
Operating schedule			
hrs/day			24
Days/month			30
Uncontrolled arsine per Novapure canister		0.003432 lb/hr/0.96 =	0.003571 lb/hr
		0.003571 lb/hr/0.0022046 lb/g/77.95 g/gmole =	0.02078 gmole/hr
Resin capacity		121 L*1.12 gmole/L =	135.52 gmole
Resin lasts		135.52gmole/0.020779 gmole/hr =	6,522 hrs
			272 days
			9.1 months
Replacement times per year:			2 times

**Resin Adsorber
By-Pass Canister**

Resin volume per canister	(Manufacturer's data)	(0.3 gallon)	1.13 L
Resin capacity	(Manufacturer's data)			1.12 gmoles/L
Molecular weights:				
Arsine				77.95 g/gmole
Arsenic				74.92 g/gmole
Arsenic in arsine				96%
Uncontrolled arsenic	(Arsine Emissions - 4 Ion Implanter Using Arsine)			0.003432 lb/hr
Conversion from g to lb				0.0022046 lb/g
Operating schedule				
hrs/day				24
Days/month				30
Uncontrolled arsine per Novapure canister			0.003432 lb/hr/0.96 =	0.003571 lb/hr
			0.003571 lb/hr/0.0022046 lb/g/77.95 g/gmole =	0.02078 gmoles/hr
Resin capacity			1.13 L*1.12 gmoles/L =	1.27 gmoles
Resin lasts			1.27gmoles/0.020779 gmole/hr =	61 hrs
				2.5 days

**ATTACHMENT
I C Manufacturing**

Previous:
Given:

504815 G8268

A/N: 511731

	MW	Process	Through Vector	lb/month	Breakdown Information ^(Note 1)			
					Used	Part of U _i Transformed		Reacted to Form
					U _i	To	Amount	Acids
					(1)	(2)	(3)	(1)-(3)
AsH ₃	77.95			-				
PH ₃ Diffusion	34.00	Etch	100%	5				
SiH ₄ Diffusion	32.12	Poly	16%	50				
SiH ₄ Diffusion	32.12	LTO & Nitrile		100				
SiH ₂ Cl ₂	101.01							
BF ₃ Boron trifluoride	67.81	implant		2				
BCl ₃ Boron trichloride	303.326							
C ₂ F ₆ Hexafluoroethane	138.01	Etch	25%	340	0.6	CF4	0.4	0.2
CHF ₃ Fluoroform	70.01	Etch		120	0.6	CF4	0.07	0.53
CF ₄ Tetrafluoromethane	88.00	Etch			0.3			0.3
Cl ₂	70.91			250				
SF ₆ Sulfur hexachloride	146.05	Etch		180	0.8			0.8
HBr	80.9119							
SiCl ₄	169.90							
NH ₃	17.03							
N ₂ O	44.01							
NF ₃ Nitrogen trifluoride	71.00	Etch		40	0.8			0.8
Metex L5B								
POCl ₃ Diffusion	153.33			30				
Isopropanol								
Acetone								
CH ₃ CCl ₃ (TCA)	133.40			70				
CHCl ₃ Chloroform	119.38	Etch						
C ₈ H ₂₀ SiO ₄ (TEOS)	208.33	Diffusion		200				

Note 1: Information from 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Molecular weight (MW)

	AsH3	PH3	SiH4	BF3	CF4	N2O	H3PO4	SiO2	H3BO3
MW	77.95	34.00	32.12	67.81	88.00	44.0128	98	60.08	61.83
	HCl	H2SO4	BCl3	C2F6	SF6	HBr	NH3	HF	POCl3
MW	36.46	98.07	303.33	138.01	146.05	80.9119	17.03	20.01	153.3322

Operating schedule:

hrs/day	24 hrs/day
days/wk	7 days/wk
wks/yr	52 wks/yr

Main scrubber control efficiencies^(a)

HCl	95%
HF	95%
H ₂ SO ₄	95%
H ₃ PO ₄	95%
HBr	95%
H ₃ BO ₃	95%
SiO ₂	90%

^(a) Information from HEE Environmental Engineering.

Vector scrubber control efficiencies:

HF (A conservative 95% is used)	95%
Solid	50%

Diffusion furnaces integrated filters control efficiency:

SiO ₂	98%
P ₂ O ₅	0%

PM10 in PM

96%

Computations:

Emissions, lb/hr:

Except where indicated, all chemicals are used up in the process.

H₃PO₄ from PH₃

The ratio 1/1 means 1 mole of H₃PO₄ is created per mole of PH₃

PM

Uncontrolled

$$5 \text{ lb/month} / 30 \text{ days/month} / 24 \text{ hrs/day} * (1/1) * 98 \text{ lb/lbmole} / 34 \text{ lb/lbmole} * (1-0) = 0.020 \text{ lb/hr}$$

Controlled

$$0.02 \text{ lb/hr} * (1-0.95) = 0.0010 \text{ lb/hr}$$

PM10			
Uncontrolled		$0.02 \text{ lb/hr} \times 0.96 =$	0.019 lb/hr
Controlled		$0.001001 \text{ lb/hr} \times 0.96 =$	0.000961 lb/hr
SiO2 from SiH4 Poly	(Poly process)		
PM			
Uncontrolled			
50 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/32.12 lb/lbmole*(1-0.98) =			0.0026 lb/hr
Controlled		$0.003 \text{ lb/hr} \times (1-0.9) =$	0.0003 lb/hr
PM10			
Uncontrolled		$0.003 \text{ lb/hr} \times 0.96 =$	0.002 lb/hr
Controlled		$0.0003 \text{ lb/hr} \times 0.96 =$	0.0002 lb/hr
SiO2 from SiH4	(LTO process)		
PM			
Uncontrolled			
100 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/32.12 lb/lbmole*(1-0.98) =			0.005 lb/hr
Controlled		$0.005 \text{ lb/hr} \times (1-0.9) =$	0.00052 lb/hr
PM10			
Uncontrolled		$0.005 \text{ lb/hr} \times 0.96 =$	0.005 lb/hr
Controlled		$0.0005 \text{ lb/hr} \times 0.96 =$	0.0005 lb/hr
H3BO3 from BF3			
PM			
Uncontrolled	2 lb/month/30 days/month/24 hrs/day*(1/1)*61.83 lb/lbmole/67.81 lb/lbmole =		0.0025 lb/hr
Controlled		$0.0025 \text{ lb/hr} \times (1-0.95) =$	0.00013 lb/hr
PM10			
Uncontrolled		$0.0025 \text{ lb/hr} \times 0.96 =$	0.0024 lb/hr
Controlled		$0.00013 \text{ lb/hr} \times 0.96 =$	0.0001 lb/hr
HF from BF3			
PM			
Uncontrolled	2 lb/month/30 days/month/24 hrs/day*(3/1)*20.01 lb/lbmole/67.81 lb/lbmole =		0.0025 lb/hr
Controlled		$0.0025 \text{ lb/hr} \times (1-0.95) =$	0.0001 lb/hr
PM10			
Uncontrolled		$0.0025 \text{ lb/hr} \times 0.96 =$	0.0024 lb/hr
Controlled		$0.0001 \text{ lb/hr} \times 0.96 =$	0.0001 lb/hr
HF from C2F6			
PM			
Uncontrolled			
340 lb/month/30 days/month/24 hrs/day*(6/1)*20.01 lb/lbmole/138.01 lb/lbmole*0.2 =			0.082 lb/hr
Overall control efficiency for Vector scrubber: $1 - (0.25 \times (1-0.95) + 1-0.25) = 0.25 \times 0.95 =$			24%
(25% goes thru Vector scrubber, 75 % bypasses it)			
Controlled		$0.0822 \text{ lb/hr} \times (1-0.24) \times (1-0.95) =$	0.0031 lb/hr
PM10			
Uncontrolled		$0.0822 \text{ lb/hr} \times 0.96 =$	0.079 lb/hr
Controlled		$0.0031 \text{ lb/hr} \times 0.96 =$	0.0030 lb/hr
HF from CHF3			
PM			
Uncontrolled			
120 lb/month/30 days/month/24 hrs/day*(3/1)*20.01 lb/lbmole/70.01 lb/lbmole*0.53 =			0.0757 lb/hr
Controlled		$0.075737 \text{ lb/hr} \times (1-0.95) =$	0.0038 lb/hr
PM10			
Uncontrolled		$0.0757 \text{ lb/hr} \times 0.96 =$	0.0727 lb/hr
Controlled		$0.0038 \text{ lb/hr} \times 0.96 =$	0.0036 lb/hr
HCl from Cl2			
PM			
Uncontrolled	250 lb/month/30 days/month/24 hrs/day*(2/1)*36.46 lb/lbmole/70.91 lb/lbmole =		0.36 lb/hr
Controlled		$0.36 \text{ lb/hr} \times (1-0.95) =$	0.018 lb/hr
PM10			
Uncontrolled		$0.36 \text{ lb/hr} \times 0.96 =$	0.34 lb/hr
Controlled		$0.018 \text{ lb/hr} \times 0.96 =$	0.02 lb/hr
HF from SF6			
PM			
Uncontrolled			
180 lb/month/30 days/month/24 hrs/day*(6/1)*20.01 lb/lbmole/146.05 lb/lbmole*0.8 =			0.16 lb/hr
Controlled		$0.16 \text{ lb/hr} \times (1-0.95) =$	0.008 lb/hr
PM10			
Uncontrolled		$0.16 \text{ lb/hr} \times 0.96 =$	0.16 lb/hr
Controlled		$0.008 \text{ lb/hr} \times 0.96 =$	0.008 lb/hr
H2SO4 from SF6			
PM			
Uncontrolled			
180 lb/month/30 days/month/24 hrs/day*(1/1)*98.07 lb/lbmole/146.05 lb/lbmole*0.8 =			0.13 lb/hr
Controlled		$0.13 \text{ lb/hr} \times (1-0.95) =$	0.00671 lb/hr
PM10			
Uncontrolled		$0.13 \text{ lb/hr} \times 0.96 =$	0.13 lb/hr
Controlled		$0.00671 \text{ lb/hr} \times 0.96 =$	0.00645 lb/hr

HF from NF3
 PM
 Uncontrolled 40 lb/month/30 days/month/24 hrs/day*(3/1)*20.01 lb/lbmole/71 lb/lbmole*0.8 = 0.038
 Controlled 0.038 lb/hr*(1-0.95) = 0.0019 lb/hr
 PM10
 Uncontrolled 0.038 lb/hr*0.96 = 0.04 lb/hr
 Controlled 0.0019 lb/hr*0.96 = 0.0018 lb/hr
 H₃PO₄ from POCl₃
 PM
 Uncontrolled I/1 means 1 mole of H₃PO₄ is produced per mole of POCl₃
 30 lb/month/30 days/month/24 hrs/day*(1/1)*98 lb/lbmole/153.33 lb/lbmole = 0.027 lb/hr
 Controlled 0.027 lb/hr*(1-0.95) = 0.001332 lb/hr
 PM10
 Uncontrolled 0.027 lb/hr*0.96 = 0.026 lb/hr
 Controlled 0.001332 lb/hr*0.96 = 0.0013 lb/hr
 HCl from POCl₃
 PM
 Uncontrolled 30 lb/month/30 days/month/24 hrs/day*(3/1)*36.46 lb/lbmole/153.33 lb/lbmole = 0.030 lb/hr
 Controlled 0.03 lb/hr*(1-0.95) = 0.001 lb/hr
 PM10
 Uncontrolled 0.03 lb/hr*0.96 = 0.03 lb/hr
 Controlled 0.0015 lb/hr*0.96 = 0.001 lb/hr
 HCl from CH₃CCl₃
 PM
 Uncontrolled 30 lb/month/30 days/month/24 hrs/day*(3/1)*36.46 lb/lbmole/153.33 lb/lbmole = 0.080 lb/hr
 Controlled 0.08 lb/hr*(1-0.95) = 0.004 lb/hr
 PM10
 Uncontrolled 0.08 lb/hr*0.96 = 0.08 lb/hr
 Controlled 0.004 lb/hr*0.96 = 0.004 lb/hr
 SiO₂ from C₈H₂₀SiO₄
 PM
 Uncontrolled 200 lb/month/30 days/month/24 hrs/day*(1/1)*60.08 lb/lbmole/208.33 lb/lbmole = 0.0016 lb/hr
 Controlled 0.0016 lb/hr*(1-0.9) = 0.00016 lb/hr
 PM10
 Uncontrolled 0.0016 lb/hr*0.96 = 0.0015 lb/hr
 Controlled 0.00016 lb/hr*0.96 = 0.00015 lb/hr

Emission	From	PM		PM10	
		Uncontr.	Contr.	Uncontr.	Contr.
H ₃ PO ₄	PH ₃	0.020	0.001001	0.019	0.000961
SiO ₂	SiH ₄ Pubr	0.003	0.0003	0.002	0.00025
SiO ₂	SiH ₄ LTO	0.005	0.0005	0.005	0.00050
SiO ₂	SiH ₂ Cl ₂	-	-	-	-
HCl	SiH ₂ Cl ₂	-	-	-	-
H ₃ BO ₃	BF ₃	0.003	0.0001	0.002	0.00012
HF	BF ₃	0.002	0.0001	0.002	0.00012
H ₃ BO ₃	BCl ₃	-	-	-	-
HCl	BCl ₃	-	-	-	-
HF	C ₂ F ₆	0.082	0.003	0.08	0.003
HF	CHF ₃	0.076	0.0038	0.073	0.0036
HF	CF ₄	-	-	-	-
HCl	Cl ₂	0.36	0.018	0.34	0.0171
HF	SF ₆	0.164	0.0082	0.16	0.00789
H ₂ SO ₄	SF ₆	0.134	0.00671	0.13	0.00645
HBr	HBr	-	-	-	-
HF	NF ₃	0.04	0.0019	0.04	0.00180
H ₃ PO ₄	POCl ₃	0.03	0.001	0.03	0.00128
HCl	POCl ₃	0.03	0.001	0.03	0.00143
HCl	CH ₃ CCl ₃	0.08	0.004	0.08	0.00383
HCl	CHCl ₃	-	-	-	-
SiO ₂	C ₈ H ₂₀ SiO ₄	0.002	0.000	0.00	0.00015
Total		1.02	0.05	0.98	0.05
lb/day				23.54	1.17
lb/yr					424.20

Uncontrolled PM10 emissions:
 lb/hr (From the table above) 0.98 lb/hr
 lb/day 23.54 lb/day

Controlled PM10 emissions:

lb/hr (From the table above) 0.05 lb/hr
 lb/day 1.17 lb/day
 lb/yr 424.20 lb/yr

Rule 1401 chemicals

(lb/hr from above)

H₃PO₄ lb/hr 0.0010008+0.0013315 = 0.002332 lb/hr
 lb/yr 0.0023 lb/hr*24 hrs/day*7 days/wk*52 wks/yr = 20.3754 lb/yr
 HCl lb/hr 0+0+0.0179+0.001 = 0.019 lb/hr
 lb/yr 0.019 lb/hr*24 hrs/day*7 days/wk*52 wks/yr = 168.96 lb/yr
 HF lb/hr 0.0001+0.003+0.0038+0+0.01+0.00187882296107569 = 0.02 lb/hr
 lb/yr 0.02 lb/hr*24 hrs/day*7 days/wk*52 wks/yr = 149.75 lb/yr
 H₂SO₄ lb/hr 0.01 lb/hr*24 hrs/day*7 days/wk*52 wks/yr = 58.66 lb/yr
 lb/yr

NSR & AEIS Inputs:

	PM	PM10
lb/hr		
Uncontr.	1.02	0.98
Contr.	0.05	0.05
lb/day		
Uncontr.		24
Contr.		1.17
lb/yr (Contr.)		424.20

Permit limits:

PH₃ 5 lb/month
 SiH₄ 50+100 = 150 lb/month
 BF₃ 2 lb/month
 C₂F₆ 340 lb/month
 CHF₃ 120 lb/month
 Cl₂ 250 lb/month
 SF₆ 180 lb/month
 NF₃ 40 lb/month
 POC₃ 30 lb/month
 CH₃CCl₃ 70 lb/month
 C₈H₂₀SiO₄ TEOS 200 lb/month

**Arsine Emissions
5 Ion Implanters Using Arsine**

<u>Given:</u>	A/N 511731
1 Arsine flow rate to implanter	0.01 L/min
2 Operating schedule:	
a Hours/day	24
b Days/week	7
c Weeks/year	52
3 Sensor analyzing time (collecting sample & analyzing) (6 times: 3 at breakthrough at main canister and 3 at breakthrough at standby canister, 60 sec each)	360 sec
4 Time period between the time sensor detects break through at outlet of main canister and the time that effluent from implanter is completely switched to standby canister (Interlocks for automatic switching are required) - 3 times at 30 seconds each.	90 sec
5 Time period between the time sensor detects break through at outlet of standby canister and the time that arsine flow to implanter is shut down (Interlocks for automatic shutdown are required) - 3 times at 30 seconds each.	90 sec
6 Scrubber replacements each year	3
7 Number of scrubbers (cans) in the permit unit	5
Molecular weights:	
Arsine	77.95 lb/lbmole
Arsenic	74.92 lb/lbmole
Ionization efficiency	90%
Arsenic in arsine	96%
Implant efficiency	45%
Control efficiency:	99%
Ideal gas molar volume @ 60 F & 1 atmosphere	379.49 ft ³ /lbmole
Conversion from liters to ft ³ :	0.035 ft ³ /L
Arsine usage cushion factor	1
<u>Note:</u> Cushion factor is based on permit engineer's judgements and used to give the applicant a cushion to the permit limit(s) to insure compliance.	
<u>Computations:</u>	
<u>For 1 resin can:</u>	
<u>(a) During normal operation:</u>	
Arsine usage:	
$0.0102 \text{ L/min} * 0.035 \text{ cf/L} * 60 \text{ min/hr} * 24 \text{ hrs/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} / 379.49 \text{ cf/lbmole} * 77.95 \text{ lb/lbmole} * 1 =$	38.90 lb/yr
Arsenic emissions:	
Uncontrolled	$38.9 \text{ lb/yr} * 0.96 \text{ arsenic in 1 arsine} * ((1-0.9)+0.9*(1-0.45)) = 22.25 \text{ lb/yr}$
	$22.25 \text{ lb/yr} / 52 \text{ wks/yr} / 7 \text{ days/wk} / 24 \text{ hrs/day} = 0.00255 \text{ lb/hr}$
Controlled	$22.25 \text{ lb/yr} * (1-0.99) = 0.222 \text{ lb/yr}$
	$0.00255 \text{ lb/hr} * (1-0.99) = 2.55E-05 \text{ lb/hr}$
<u>(b) During other periods:</u>	
(Switching from main canister to standby canister and shutdown)	
Amount of time when arsine is not controlled:	$(360 \text{ sec} + 90 \text{ sec} + 90 \text{ sec}) * 3 \text{ times/yr} = 1620 \text{ sec/yr}$
Arsine used:	
$0.0102 \text{ L/min} / 60 \text{ sec/min} * 1620 \text{ sec/yr} * 0.035 \text{ cf/L} / 379.49 \text{ cf/lbmole} * 77.95 \text{ lb/lbmole} * 1 =$	0.00200 lb/yr
Arsenic emissions:	$0.002 \text{ lb/yr} * 0.96 \text{ lb arsenic/lb arsine} * ((1-0.9)+0.9*(1-0.45)) = 0.00115 \text{ lb/yr}$

(c) Total arsenic emissions: $0.222 \text{ lb/yr} + 0.00115 \text{ lb/yr} = 0.224 \text{ lb/yr}$
 $0.224 \text{ lb/yr} / 52 \text{ wks/yr} / 7 \text{ days/wk} / 24 \text{ hrs/day} = 2.560\text{E-}05 \text{ lb/hr}$

Arsine usage $0.0102 \text{ L/min} * 60 \text{ min/hr} * 24 \text{ hrs/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} * 1 = 5,362.85 \text{ L/yr}$
 $5362.85 \text{ L/yr} * 0.035 \text{ cf/L} / 379.49 \text{ cf/lbmole} * 77.95 \text{ lb/lbmole} = 38.90 \text{ lb/yr}$

Overall control efficiency: $1 - 0.224 / 22.25 = 98.995\%$

For a maximum of 5 cans:

Total arsenic emissions: $0.224 \text{ lb/yr-can} * 5 \text{ cans} = 1.118 \text{ lb/yr}$
 $1.118 \text{ lb/yr} / 52 \text{ wks/yr} / 7 \text{ days/wk} / 24 \text{ hrs/day} = 1.28\text{E-}04 \text{ lb/hr}$

Results of risk analysis:

	Residential	Commercial
MICR	9.49E-07	3.49E-07

Arsine flow rate limit (per can) $0.0102 \text{ L/min} * 1 \text{ (cushion factor)} = 0.01 \text{ L/min}$

Table A

Modeling emissions rate	1.000000	gr/sec
Modeling emissions rate	7.93	lb/hr
Modeling emissions rate	34.73	tons/yr
Max hr/dy	24	hr/day
Day per week	7	dy/wk
Week per year	52	wk/yr
MODELING RESULTS -MAX ONE HOUR		
Distance residence	1000.00	meter
Max. 1-hour Conc. Residence	44.300000	ug/m3
Annualized Conc. Residence	3.544000	ug/m3
Distance Commerical	50.00	meter
Max. 1-hour Conc. Commerical	87.230000	ug/m3
Annualized Conc. Commerical	6.978400	ug/m3

Annualized X/Q		
X/Q Residential	0.102040589	(ug/m ³)/(tons/yr)
X/Q Commercial	0.20092552	(ug/m ³)/(tons/yr)

Max. X/Q		
X/Q Residential	5.586722222	(ug/m ³)/(lbs/hr)
X/Q Commercial	11.00067222	(ug/m ³)/(lbs/hr)

Table B (These values are needed to calculate cancer burden)

	Interpolation								
	Stack Height (ft): 50			Row: 3					
	Residential			Industrial			X/Q for one-in-a-million		
	near	actual	far	near	actual	far	near	actual	far
Distance	200.00	1000.00	1000.00	200.00	50.00	1000.00	200.00	2236.97	1000.00
X/Q - 1 hr conc ug/m3	9.09	44.30	5.52	9.09	87.23	5.52	9.09		5.52
X/Q Annualized (ug/m ³)/(tons/yr)	0.02	0.10	0.01	0.02	0.20	0.01	0.02		0.01

CONVERSION CALCULATOR FOR SCREEN MODELING INPUT (British to Metric Units)

SCREEN INPUT DATA - BRITISH UNITS

Actual exhausted rate	100.00	acfm
Temperature	900.00	degree F
Stack diameter	12.00	in
Stack height	20.00	ft
Modeling emissions rate	0.04	lb/hr

SCREEN INPUT DATA - METRIC UNITS

Temperature	755.222	degrees K
Stack diameter	0.305	meter
Stack area	0.073	square meter
Stack height	6.096	meter
Stack velocity	0.647	m/s
Modeling emissions rate	0.00504	gr/s

TIER 3 SCREENING RISK ASSESSMENT REPORT

A/N: 511731
 International Recifier

Application deemed complete date: 06/15/10

2. Tier 2 Data

MET Factor	1.00
4 hr	0.87
6 or 7 hrs	0.88

Dispersion Factors tables

3	For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.102040589	5.586722222
Commercial	0.20092552	11.00067222

Adjustment and Intake Factors

	AFann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

A/N: 511731

Application deemed complete date: 06/15/10

TIER 3 RESULTS

5a. MICR

$MICR = CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) * AFann * MET * DBR * EVF * 1.E-6 * MP$

Compound	Residential	Commercial
Arsenic and arsenic compounds (inorganic)	9.49E-07	3.49E-07
Phosphoric acid		
Hydrogen chloride (hydrochloric acid)		
Hydrogen fluoride (hydrofluoric acid)		
Sulfuric acid (and oleum)		
Total	9.49E-07	3.49E-07
	PASS	PASS

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	no
X/Q for one-in-a-million:	
Distance (meter)	2236.97
Area (km2):	1.57E+01
Population:	109989
Cancer Burden:	1.04E-01

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL			Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		6.95E-03	Pass	Pass
Developmental - DEV	6.67E-03	6.95E-03	Pass	Pass
Endocrine system - END			Pass	Pass
Eye	8.87E-04		Pass	Pass
Hematopoietic system - HEM			Pass	Pass
Immune system - IMM			Pass	Pass
Kidney - KID			Pass	Pass
Nervous system - NS		6.95E-03	Pass	Pass
Reproductive system - REP	6.67E-03		Pass	Pass
Respiratory system - RES	1.50E-03	8.07E-03	Pass	Pass
Skin			Pass	Pass

A/N: 511731

Application deemed complete date: 06/15/10

6a. Hazard Index Acute

$HIA = [Q(\text{lb/hr}) * (X/Q)_{\text{max}}] * AF / \text{Acute REL}$

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Arsenic and arsenic compounds (inorganic)			3.39E-03					3.39E-03		
Phosphoric acid										
Hydrogen chloride (hydrochloric acid)				5.15E-05					5.15E-05	
Hydrogen fluoride (hydrofluoric acid)				3.99E-04					3.99E-04	
Sulfuric acid (and oleum)									3.13E-04	
Total			3.39E-03	4.50E-04				3.39E-03	7.63E-04	

Compound	HIA - Commercial									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Arsenic and arsenic compounds (inorganic)			6.67E-03					6.67E-03		
Phosphoric acid										
Hydrogen chloride (hydrochloric acid)				1.01E-04					1.01E-04	
Hydrogen fluoride (hydrofluoric acid)				7.86E-04					7.86E-04	
Sulfuric acid (and oleum)									6.16E-04	
Total			6.67E-03	8.87E-04				6.67E-03	1.50E-03	

6b. Hazard Index Chronic

$$HIC = [Q(\text{ton/yr}) * (X/Q) * MET * MP] / \text{Chronic REL}$$

Compound	HIC - Residential												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic and arsenic compounds (inorganic)			3.62E-03	3.62E-03						3.62E-03			
Phosphoric acid												1.49E-04	
Hydrogen chloride (hydrochloric acid)												9.58E-04	
Hydrogen fluoride (hydrofluoric acid)													2.99E-03
Sulfuric acid (and oleum)													
Total			3.62E-03	3.62E-03						3.62E-03		4.10E-03	

6b. Hazard Index Chronic (cont.)

A/N: 511731

Application deemed complete date:

06/15/10

Compound	HIC - Commercial												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic and arsenic compounds (inorganic)			6.95E-03	6.95E-03						6.95E-03			
Phosphoric acid												2.92E-04	
Hydrogen chloride (hydrochloric acid)												1.89E-03	
Hydrogen fluoride (hydrofluoric acid)													
Sulfuric acid (and oleum)												5.89E-03	
Total			6.95E-03	6.95E-03						6.95E-03		8.07E-03	

10/28/08
13:02:27

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Scrubbers 101 & 102

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 1.00000
STACK HEIGHT (M) = 15.2400
STK INSIDE DIAM (M) = 1.4700
STK EXIT VELOCITY (M/S) = 13.5147
STK GAS EXIT TEMP (K) = 297.0000
AMBIENT AIR TEMP (K) = 293.0000
RECEPTOR HEIGHT (M) = .0000
URBAN/RURAL OPTION = URBAN
BUILDING HEIGHT (M) = .0000
MIN HORIZ BLDG DIM (M) = .0000
MAX HORIZ BLDG DIM (M) = .0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 48600.000 (ACFM)

BUOY. FLUX = .964 M**4/S**3; MOM. FLUX = 97.341 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
25.	.4943	3	10.0	10.9	3200.0	19.96	5.57	5.11	NO
100.	59.74	3	4.0	4.4	1280.0	28.94	21.92	20.38	NO
200.	55.05	4	2.5	2.8	800.0	36.70	31.40	27.88	NO
300.	77.50	6	1.0	1.1	10000.0	38.60	31.89	21.02	NO
400.	87.22	6	1.0	1.1	10000.0	38.60	41.39	26.16	NO
500.	82.23	6	1.0	1.1	10000.0	38.60	50.65	30.97	NO
600.	73.34	6	1.0	1.1	10000.0	38.60	59.64	35.46	NO
700.	64.40	6	1.0	1.1	10000.0	38.60	68.39	39.68	NO
800.	56.53	6	1.0	1.1	10000.0	38.60	76.88	43.66	NO
900.	49.87	6	1.0	1.1	10000.0	38.60	85.15	47.44	NO
1000.	44.30	6	1.0	1.1	10000.0	38.60	93.21	51.03	NO
1100.	39.65	6	1.0	1.1	10000.0	38.60	101.05	54.47	NO
1200.	35.73	6	1.0	1.1	10000.0	38.60	108.71	57.76	NO
1300.	32.43	6	1.0	1.1	10000.0	38.60	116.18	60.92	NO
1400.	29.60	6	1.0	1.1	10000.0	38.60	123.48	63.96	NO
1500.	27.18	6	1.0	1.1	10000.0	38.60	130.61	66.90	NO
1600.	25.08	6	1.0	1.1	10000.0	38.60	137.59	69.74	NO
1700.	23.25	6	1.0	1.1	10000.0	38.60	144.43	72.49	NO
1800.	21.65	6	1.0	1.1	10000.0	38.60	151.12	75.16	NO
1900.	20.23	6	1.0	1.1	10000.0	38.60	157.68	77.75	NO
2000.	18.97	6	1.0	1.1	10000.0	38.60	164.11	80.28	NO
2100.	17.84	6	1.0	1.1	10000.0	38.60	170.43	82.74	NO

2200.	16.83	6	1.0	1.1	10000.0	38.60	176.62	85.14	NO
2300.	15.92	6	1.0	1.1	10000.0	38.60	182.71	87.48	NO
2400.	15.10	6	1.0	1.1	10000.0	38.60	188.69	89.77	NO
2500.	14.35	6	1.0	1.1	10000.0	38.60	194.57	92.01	NO
2600.	13.67	6	1.0	1.1	10000.0	38.60	200.35	94.20	NO
2700.	13.04	6	1.0	1.1	10000.0	38.60	206.04	96.35	NO
2800.	12.47	6	1.0	1.1	10000.0	38.60	211.64	98.46	NO
2900.	11.94	6	1.0	1.1	10000.0	38.60	217.15	100.52	NO
3000.	11.45	6	1.0	1.1	10000.0	38.60	222.59	102.55	NO
3500.	9.479	6	1.0	1.1	10000.0	38.60	248.61	112.20	NO
4000.	8.064	6	1.0	1.1	10000.0	38.60	272.96	121.13	NO
4500.	7.003	6	1.0	1.1	10000.0	38.60	295.89	129.49	NO
5000.	6.181	6	1.0	1.1	10000.0	38.60	317.61	137.36	NO
5500.	5.526	6	1.0	1.1	10000.0	38.60	338.27	144.83	NO
6000.	4.993	6	1.0	1.1	10000.0	38.60	358.00	151.94	NO
6500.	4.552	6	1.0	1.1	10000.0	38.60	376.90	158.74	NO
7000.	4.181	6	1.0	1.1	10000.0	38.60	395.06	165.27	NO
7500.	3.864	6	1.0	1.1	10000.0	38.60	412.55	171.56	NO
8000.	3.591	6	1.0	1.1	10000.0	38.60	429.45	177.63	NO
8500.	3.354	6	1.0	1.1	10000.0	38.60	445.79	183.50	NO
9000.	3.146	6	1.0	1.1	10000.0	38.60	461.64	189.20	NO
9500.	2.961	6	1.0	1.1	10000.0	38.60	477.02	194.73	NO
10000.	2.797	6	1.0	1.1	10000.0	38.60	491.98	200.11	NO
15000.	1.794	6	1.0	1.1	10000.0	38.60	623.68	247.63	NO
20000.	1.319	6	1.0	1.1	10000.0	38.60	733.36	287.45	NO
25000.	1.042	6	1.0	1.1	10000.0	38.60	829.18	322.40	NO
30000.	.8608	6	1.0	1.1	10000.0	38.60	915.28	353.92	NO
40000.	.7228	4	1.0	1.1	320.0	68.88	1552.30	1553.24	NO
50000.	.6427	4	1.0	1.1	320.0	68.88	1745.81	1750.07	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
 398. 87.23 6 1.0 1.1 10000.0 38.60 41.30 26.11 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	37.30	3	10.0	10.9	3200.0	19.96	10.97	10.08	NO
1000.	44.30	6	1.0	1.1	10000.0	38.60	93.21	51.03	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

 *** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	87.23	398.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

**Modeling Data
Scrubbers 101 & 102**

A/N 511733

Exhaust flow rate:
acfm
scfm

48,600

Stack diameter, in
Stack height, ft
Temperature, F
Catalytic

58 in

50 ft

75 F

Yes	No*
	x

Rain cap?

*Or with a swing rain cap fully open when operated.

Data for modeling:

Actual volume flow rate (acfm)

48,600 acfm

Stack diameter, m

1.47 m

Stack height, m

15.24 m

Temperature, K

297 K

**Calculations
Photolithographic System**

Previous: G8253 503213

A/N: 511735

This facility has a VOC cap of 1,800 lbs in any one calendar month. VOC emissions from the previous application will be used for AEIS and NSR inputs.

Information from A/N 503213 (Previous to 511735).

Operating schedule:

hrs/day

24 hrs/day

days/wk

7 days/wk

wks/yr

52 wks/yr

VOC emissions:

	VOC	
	Uncontr.	Controlled
lb/hr	5.61	0.28
lb/day	135	6.73
lb/yr	-	2,450.61

Cresol

0.0011 lb/hr

(From Cresol Emissions)

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	25
Receptor Distance (for X/Q LOOKUP)	25

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
8.31E-07	PASSED
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Cresol mixtures	1.65E-02	1.10E-03	1.98E+04		8.31E-07	

TOTAL (APPLICATION SCREENING INDEX)

8.31E-07

Cresol Emissions

A/Ns 511735
511736

Operating schedule
hrs/day
days/wk
wks/yr

24 hrs/day
7 days/wk
52 wks/yr

	Emissions, lbs*				
	Cresol Content	Resist		Cresol	
		Max. Monthly	Annual	Annual	hourly
(1)	(2)	(3) =(2)*12	(4)=(3)*(1)	(5)=(4)/52/7/24	
Positive photoreist 815	1%	17.746	212.952	2.12952	0.000243764
Positive photoreist 700-1.2	1%	2.73	32.76	0.3276	0.0000375
Positive photoreist 3615	0.2%	1.632	19.584	0.039168	4.48352E-06
Total					0.000285747

Corrected for efficiency change $0.00028575 \text{ lb/hr} \cdot (1-0.95)/(1-0.987) =$ 0.001099 lb/hr
(From 98.7% to 95%, worst case)

Note: *Facility emissions

**Calculations
Photolithographic System**

Previous: G2002 460747

A/N: 511736

This facility has a VOC cap of 1,800 lbs in any one calendar month. VOC emissions from the previous application will be used for AEIS and NSR inputs.

Information from A/N 460747 (Previous to 511736) - Application Emission Report (AE).

Operating schedule:

hrs/day	24 hrs/day
days/wk	7 days/wk
wks/yr	52 wks/yr

VOC emissions:

	VOC	
	Uncontr.	Controlled
lb/hr	22.42	0.29
lb/day	538.05	6.99
lb/yr	-	2,546.05

Cresol 0.0003 lb/hr
(From Cresol Emissions)

NSR Tracking System - [Application Emission Report (AE)]

File Edit Options Window

PROCESS APPROVE STC ACCOUNT REPORTS PRINTER EXIT HELP NAPSHO

Facility ID: 48522 Application #: 460747 Emittant: Device: **INTERNATIONAL RECTIFIER HEXFET AMERICA**

History Approve UnApprove Zone: 26 Air Basin: SC

	APPL_N	EMI_ID	MEASUR	EMI_AMT	EMI_AMT_ENT_DAT	EMI_AMT_ENT
1	460747	ROG	AV30	0	10-22-2008	kienh
2	460747	ROG	R1	22.42	02-19-2009	kienh
3	460747	ROG	R1DY	538.08	10-22-2008	kienh
4	460747	ROG	R1HR	22.42	10-22-2008	kienh
5	460747	ROG	R2	.29	02-19-2009	kienh
6	460747	ROG	R2DY	6.96	10-22-2008	kienh
7	460747	ROG	R2HR	.29	10-22-2008	kienh
8	460747	ROG	RACT	0	10-22-2008	kienh

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	25
Receptor Distance (for X/Q LOOKUP)	25

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
8.31E-07	
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Cresol mixtures	1.65E-02	1.10E-03	1.98E+04		8.31E-07	

TOTAL (APPLICATION SCREENING INDEX)

8.31E-07

Cresol Emissions

A/Ns 511735
511736

Operating schedule
hrs/day
days/wk
wks/yr

24 hrs/day
7 days/wk
52 wks/yr

	Emissions, lbs*				
	Cresol Content	Resist		Cresol	
		Max. Monthly	Annual	Annual	hourly
(1)	(2)	(3) =(2)*12	(4)=(3)*(1)	(5)=(4)/527/24	
Positive photoreist 815	1%	17.746	212.952	2.12952	0.000243764
Positive photoreist 700-1.2	1%	2.73	32.76	0.3276	0.0000375
Positive photoreist 3615	0.2%	1.632	19.584	0.039168	4.48352E-06
Total					0.000285747

Corrected for efficiency change (From 98.7% to 95%, worst case) $0.00028575 \text{ lb/hr} * (1-0.95)/(1-0.987) = 0.001099 \text{ lb/hr}$

Note: *Facility emissions

**ATTACHMENT
Oxidizer
McGill**

A/N 511737

Previous: G8254 503214

The emissions are as those for Zink oxidizer except that the 30-day average emissions will be recorded as zeros.

Emissions:

	ROG	NOx	SOx	CO	PM10
lb/hr	0.03	0.24	0	0.09	0.01
lb/day	0.72	5.76	0	2.16	0.24
lb/yr	109	1036	12	411	87.36

**ATTACHMENT
Oxidizer**

A/N 511738

Previous: G8264 503222

Because there is no change to the oxidizer and the emissions for the previous application were calculated at the oxidizer full load, its emissions are the same.

Below are excerpts from NSR Application Emission Report for A/N 503222:

Emissions:

	ROG	NOx	SOx	CO	PM10
lb/hr	0.03	0.24	0	0.09	0.01
lb/day	0.72	5.76	0	2.16	0.24
lb/yr	109	1036	12	411	87.36

**ATTACHMENT
T-517
Mixed Acids
Vertical**

Previous: G8260 503217

A/N 511739

Given:

Tank dimensions:	ft	in		
DIA.	4	0 OK	525 gallons	4.00 ft
L	5	7		5.58 ft
Annual throughput:				4,800,000 gallons
Month selected for emission calculations:				July
Number of days in the selected month:				31
Total vapor pressure:				0.58 psia
Molecular weight				
Vapors				33.75
Cr ⁺⁶				51.94
CrO ₃				99.94
Maximum month emission*				
Working				35.29 lb/month
Breathing				0.16 lb/month
<u>Note:</u> *From TANK 4.0.9d Emissions Report				
Control efficiency:				
Acid PM				95%
Acetic acid				95%
PM in dragouts				0%
VOC				0%
Operating Schedule:				
hrs/day				24 hrs/day
days/wk				7 days/wk
weeks/yr				52 wks/yr
PM10 in Total PM:				96%
Total emissions (excluding water)				66.52%
PM in total loss (working + breathing)				0.47%
HF in PM				33.42%
H ₂ SO ₄ in PM				3.07%
HNO ₃ in PM				2.10%
HCl in PM				0.02%
H ₃ PO ₄ in PM				61.39%
Ethylene glycol monobutyl ether in total emissions (excluding water)				1.23%
Acetic acid in total emissions (excluding water)				98.06%
Weight % of copper in tank				0.0002%
Weight % of chromic acid in tank				0.0002%

**ATTACHMENT
T-517
Mixed Acids**

Note: Copper and CrO₃, solid, are dissolved in water. Their losses are due to dragouts which are small. The worst case will be that the weight concentrations of copper and CrO₃ in the vapors equal to those in the tank.

Calculations

Working volume: 470 gallons
Turnovers per year 10,213

Emissions:

Total loss (Working + breathing) $(35.29 + 0.16)$ lb/month = 35.45 lb/month
 35.45 lb/month/31 days/month = 1.1435 lb/day

Total emission 35.45 lb/month*0.6652 = 23.58 lb/month
(Uncontrolled, excluding water) 23.58 lb/month/31 days/month = 0.7607 lb/day

PM :

lb/day
Uncontrolled 1.1435 lb/day*0.0047 = 0.0054 lb/day
Controlled 0.0054 lb/day*(1-0.95) = 0.00027 lb/day

lb/hr
Uncontrolled 0.0054 lb/day/24 hrs/day = 0.00023 lb/hr
Controlled 0.00027 lb/day/24 hrs/day = 0.000011 lb/hr

lb/yr 0.00027 lb/day*7 days/wk*52 wks/yr = 0.098 lb/yr

PM10

lb/day
Uncontrolled 0.0054 lb/day*0.96 = 0.0052 lb/day
Controlled 0.00027 lb/day*0.96 = 0.00026 lb/day

lb/hr
Uncontrolled 0.00023 lb/day*0.96 = 0.00022 lb/hr
Controlled 0.000011 lb/day*0.96 = 0.000011 lb/hr

lb/yr 0.00026 lb/day*7 days/wk*52 wks/yr = 0.094 lb/yr

HF:

lb/day
Uncontrolled 0.0054 lb/day*0.3342 = 0.0018 lb/day
Controlled 0.00027 lb/day*0.3342 = 0.00009 lb/day

lb/hr
Uncontrolled 0.00023 lb/hr*0.3342 = 0.000075 lb/hr
Controlled 0.000011 lb/hr*0.3342 = 0.0000038 lb/hr

lb/yr 0.098 lb/yr*0.3342 = 0.033 lb/yr

**ATTACHMENT
T-517
Mixed Acids**

H ₂ SO ₄ :		
lb/day		
Uncontrolled	0.0054 lb/day*0.0307 =	0.00017 lb/day
Controlled	0.00027 lb/day*0.0307 =	0.000008 lb/day
lb/hr		
Uncontrolled	0.00023 lb/hr*0.0307 =	0.000007 lb/hr
Controlled	0.000011 lb/hr*0.0307 =	0.0000003 lb/hr
lb/yr	0.098 lb/yr*0.0307 =	0.003 lb/yr
HNO ₃ :		
lb/day		
Uncontrolled	0.0054 lb/day*0.021 =	0.00011 lb/day
Controlled	0.00027 lb/day*0.021 =	0.0000019 lb/day
lb/hr		
Uncontrolled	0.00023 lb/hr*0.021 =	0.000005 lb/hr
Controlled	0.000011 lb/hr*0.021 =	0.0000002 lb/hr
lb/yr	0.098 lb/yr*0.021 =	0.0021 lb/yr
HCl:		
lb/day		
Uncontrolled	0.0054 lb/day*0.0002 =	0.0000012 lb/day
Controlled	0.00027 lb/day*0.0002 =	0.000000017 lb/day
lb/hr		
Uncontrolled	0.00023 lb/hr*0.0002 =	0.00000005 lb/hr
Controlled	0.000011 lb/hr*0.0002 =	0.000000002 lb/hr
lb/yr	0.098 lb/yr*0.0002 =	0.000021 lb/yr
H ₃ PO ₄ :		
lb/day		
Uncontrolled	0.0054 lb/day*0.6139 =	0.0033 lb/day
Controlled	0.00027 lb/day*0.6139 =	0.0000012 lb/day
lb/hr		
Uncontrolled	0.00023 lb/hr*0.6139 =	0.000138 lb/hr
Controlled	0.000011 lb/hr*0.6139 =	0.0000069 lb/hr
lb/yr	0.098 lb/yr*0.6139 =	0.060 lb/yr
Copper		
lb/day		
Uncontrolled		
	1.1435 lb/day*0.000002 =	2.0E-06 lb/day
Controlled	0.0000020 lb/day*(1-0) =	1.95E-06 lb/day
lb/hr		
Uncontrolled	0.0000020 lb/day/24 hrs/day =	8.14E-08 lb/hr
Controlled	0.0000020 lb/day/24 hrs/day =	8.14E-08 lb/hr
lb/yr	0.0000020 lb/day*7 days/wk*52 wks/yr =	7.11E-04 lb/yr

**ATTACHMENT
T-517
Mixed Acids**

Cr⁺⁶
 lb/day
 Uncontrolled
 $1.1435 \text{ lb/day} * 0.000002 * 52 \text{ lb Cr/lbmole} / 100 \text{ lb CrO}_3/\text{lbmole} = 1.2\text{E-}06 \text{ lb/day}$
 Controlled
 $0.00000120 \text{ lb/day} * (1-0) = 1.20\text{E-}06 \text{ lb/day}$
 lb/hr
 Uncontrolled
 $0.00000120 \text{ lb/day} / 24 \text{ hrs/day} = 5.01\text{E-}08 \text{ lb/hr}$
 Controlled
 $0.000001202 \text{ lb/day} / 24 \text{ hrs/day} = 5.01\text{E-}08 \text{ lb/hr}$
 lb/yr
 $0.000001202 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 4.37\text{E-}04 \text{ lb/yr}$

Ethylene glycol monobutyl ether (EGME)
 lb/day
 Uncontrolled
 $0.7607 \text{ lb/day} * 0.0123 = 0.009 \text{ lb/day}$
 Controlled
 $0.009 \text{ lb/day} * (1-0) = 0.009 \text{ lb/day}$
 lb/hr
 Uncontrolled
 $0.009 \text{ lb/day} / 24 \text{ hrs/day} = 0.0004 \text{ lb/hr}$
 Controlled
 $0.009 \text{ lb/day} / 24 \text{ hrs/day} = 0.0004 \text{ lb/hr}$
 lb/yr
 $0.009 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 3.40 \text{ lb/yr}$

Acetic acid (CH₃COOH)
 lb/day
 Uncontrolled
 $0.7607 \text{ lb/day} * 0.9806 = 0.75 \text{ lb/day}$
 Controlled
 $0.75 \text{ lb/day} * (1-0.95) = 0.04 \text{ lb/day}$
 lb/hr
 Uncontrolled
 $0.75 \text{ lb/day} / 24 \text{ hrs/day} = 0.03 \text{ lb/hr}$
 Controlled
 $0.04 \text{ lb/day} / 24 \text{ hrs/day} = 0.0016 \text{ lb/hr}$
 lb/yr
 $0.04 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 13.58 \text{ lb/yr}$

	PM	PM10	HF	H ₂ SO ₄	HNO ₃	HCl	H ₃ PO ₄	Copper
lb/hr								
Uncontr.	0.000225	0.000216	7.53E-05	6.92E-06	4.73E-06	4.91E-08	3.32E-03	8.14E-08
Contr.	0.0000113	0.0000108	3.77E-06	3.46E-07	2.37E-07	2.46E-09	1.17E-06	8.14E-08
lb/day								
Uncontr.	0.005	0.0052	1.81E-03	1.66E-04	1.14E-04	1.18E-06	1.38E-04	1.95E-06
Contr.	0.00027	0.00026	9.04E-05	7.97E-06	1.90E-06	1.74E-09	6.92E-06	1.95E-06
lb/yr (Contr.)		0.094	0.033	0.0030	0.0021	0.000021	0.06	7.11E-04

**ATTACHMENT
T-517
Mixed Acids**

	Cr ⁺⁶	EGME	CH ₃ COOH	VOC
lb/hr				
Uncontr.	5.01E-08	0.0004	0.03	0.03
Contr.	5.01E-08	0.0004	0.00	0.002
lb/day				
Uncontr.	1.20E-06	0.009	0.75	0.76
Contr.	1.20E-06	0.009	0.04	0.05
lb/yr (Contr.)	4.37E-04	3.40	13.576	16.977

Throughput limit: 4800000 gals/yr/12 months/yr = 400,000 gals/month

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	50
Receptor Distance (for X/Q LOOKUP)	50

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
7.45E-01	5.00E-05
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Hydrogen fluoride (hydrofluoric acid)	3.29E-02	3.77E-06		2.40E-01		1.57E-05
Sulfuric acid (and oleum)	3.02E-03	3.46E-07	8.67E+01	1.20E-01	3.49E-05	2.89E-06
Nitric acid	2.07E-03	2.37E-07		8.59E-02		2.75E-06
Hydrogen chloride (hydrochloric acid)	2.15E-05	2.46E-09	7.80E+02	2.10E+00	2.75E-08	1.17E-09
Phosphoric acid	1.02E-02	1.17E-06	6.07E+02		1.68E-05	
Copper and copper compounds	7.11E-04	8.14E-08		9.99E-02		8.14E-07
Chromic trioxide (as chromic acid mist)	4.37E-04	5.01E-08	5.87E-04		7.45E-01	
Ethylene glycol monobutyl ether	3.40E+00	3.89E-04		1.40E+01		2.78E-05
TOTAL (APPLICATION SCREENING INDEX)					7.45E-01	5.00E-05

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: T-517 7 31 10
City:
State:
Company:
Type of Tank: Vertical Fixed Roof Tank
Description:

Tank Dimensions

Shell Height (ft): 5.58
Diameter (ft): 4.00
Liquid Height (ft): 5.58
Avg. Liquid Height (ft): 2.79
Volume (gallons): 524.54
Turnovers: 10,213.00
Net Throughput(gal/yr): 5,357,110.33
Is Tank Heated (y/n): N

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition: Good
Roof Color/Shade: White/White
Roof Condition: Good

Roof Characteristics

Type: Dome
Height (ft): 0.00
Radius (ft) (Dome Roof): 0.00

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-517 7 31 10 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg	Min.	Max.		Avg.	Min.	Max.					
Mixed Acids	Jul	71.26	65.04	77.47	64.33	0.5800	0.5800	0.5800	33.7500			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-517 7 31 10 - Vertical Fixed Roof Tank

Month.	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb)							0.1586					
Vapor Space Volume (cu ft)							38.5079					
Vapor Density (lb/cu ft)							0.0034					
Vapor Space Expansion Factor:							0.0426					
Vented Vapor Saturation Factor:							0.9139					
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):							38.5079					
Tank Diameter (ft):							4.0000					
Vapor Space Outage (ft):							3.0644					
Tank Shell Height (ft):							5.5800					
Average Liquid Height (ft):							2.7500					
Roof Outage (ft):							0.2744					
Roof Outage (Dome Roof)												
Roof Outage (ft):							0.2744					
Dome Radius (ft):							4.0000					
Shell Radius (ft):							2.0000					
Vapor Density												
Vapor Density (lb/cu ft):							0.0034					
Vapor Molecular Weight (lb/lb-mole):							33.7500					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800					
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285					
Daily Average Ambient Temp. (deg. F):							73.0500					
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731					
Liquid Bulk Temperature (deg. R):							523.9583					
Tank Paint Solar Absorptance (Shell):							0.1700					
Tank Paint Solar Absorptance (Roof):							0.1700					
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457					
Vapor Space Expansion Factor:												
Vapor Space Expansion Factor:							0.0426					
Daily Vapor Temperature Range (deg. R):							24.8571					
Daily Vapor Pressure Range (psia):							0.0000					
Breather Vent Press. Setting Range (psia):							0.0600					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.5800					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.5800					
Daily Avg. Liquid Surface Temp. (deg R):							530.9285					
Daily Min. Liquid Surface Temp. (deg R):							524.7142					
Daily Max. Liquid Surface Temp. (deg R):							537.1427					
Daily Ambient Temp. Range (deg. R):							18.3000					
Vented Vapor Saturation Factor:												
Vented Vapor Saturation Factor:							0.9139					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800					
Vapor Space Outage (ft):							3.0644					
Working Losses (lb)							35.2889					
Vapor Molecular Weight (lb/lb-mole):							33.7500					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800					
Net Throughput (gal/mo.):							448,425.8810					
Annual Turnovers:							10,213.0000					
Turnover Factor:							0.1696					
Maximum Liquid Volume (gal):							524.5384					
Maximum Liquid Height (ft):							5.5800					
Tank Diameter (ft):							4.0000					
Working Loss Product Factor:							1.0000					
Total Losses (lb):							35.4485					

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

T-517 7 31 10 - Vertical Fixed Roof Tank

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Mixed Acids	35.29	0.16	35.45

**Mixture Vapor Pressure
T-517
Mixed Acids**

Previous: Permit G8260 503217
Operating temperature
pH

70 F
2.5

A/N: 511739

Compounds	Solution	VP	Molecular	moles	Weight	Weight %		W/o water, ether & acetic acid
	wt%	mmHg	Weight	fraction	Contribution	W/ Water	W/o Water	
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HF	0.01%	0.08	20.01	0.0027	0.05	0.16%	0.24%	33.42%
NH4F	0.03%	-	37.04	-	-	-	-	0.00%
H2SO4	0.19%	0.0015	98.07	0.0000	0.00	0.01%	0.02%	3.07%
H2O2	0.09%	-	34.01	-	-	-	-	0.00%
HNO3	0.003%	0.0016	63.01	0.0001	0.00	0.01%	0.01%	2.10%
H ₃ PO ₄	0.063%	0.0300	98.00	0.001	0.10	0.29%	0.44%	61.39%
NH ₄ OH	0.027%	-	17.03	-	-	-	-	-
Chromic acid	0.0002%	-	155.82	-	-	-	-	-
Copper	0.0002%	-	63.55	-	-	-	-	-
Ethylene glycol	0.002%	-	62.07	-	-	-	-	-
Ethylene glycol monobutyl ether	0.001%	0.0700	118.18	0.002	0.28	0.82%	1.23%	
Hydrazine 35% (H ₂ N ₂ H ₂ .H ₂ O)	0.0001%	-	32.05	-	-	-	-	
KOH	0.0002%	-	56.11	-	-	-	-	-
Iodine (From KI)	0.0001%	-	253.81	-	-	-	-	-
Choline hydroxide	0.0002%	-	121.18	-	-	-	-	-
HCl	0.001%	0.00003	36.46	0.000001	0.00003	0.0001%	0.0002%	0.02%
NaOH	0.00038%	-	40.00	-	-	-	-	-
Acetic acid	0.05542%	11.00	60.05	0.37	22.01808	65.23%	98.06%	-
H ₂ O	99.52%	18.8	18.02	0.6272	11.30	33.48%	-	-
	100%	30.00			33.75	100.00%	100%	100%
	psia	0.58				66.52%		
						W/o water		
						W/o water, acetic acid & ether (PM)		
								0.47%

**Components
T-517
Mixed Acids**

Previous: 503217 G8260

A/N: 511739

0.089872538

Components, %wt																						
	Conc.	Waste, gals/month	Chemical, %wt	HF	NH4F	H2SO4	H2O2	Water	HNO3	H3PO4	Ammonia	Cr+6	Copper	Ethylene glycol	C6H14O2	Hydrazine	KOH	Iodine	Choline Hydroxide	HCl	NaOH	CH3COOH
BOE (11% HF, 36% NH4F)		300	0.0899	0.0099	0.0324			0.0476														
H2SO4		420	0.1931			0.1931																
H2O2	63%	500	0.1386				0.0873	0.0513														
H2SO4		4	0.0018			0.0018																
HNO3 Class 10	70%	2.6	0.0009					0.0003	0.0007													
HNO3	70%	8	0.0028					0.0009	0.002													
H3PO4		160	0.0631							0.0631												
NH4OH		120	0.0270								0.02696											
Chromic acid		0.3	0.0002									0.0002										
Copper		0.3	0.0002										0.0002									
Ethylene glycol		6	0.0016											0.00165								
Ethylene glycol monobutyl ether		5	0.0013												0.00134							
Hydrazine, 35%	35%	1	0.0003					0.0002								8.94E-05						
KOH			0.0002														0.0002					
Iodine (From KI)			0.0001															0.00013				
Choline hydroxide			0.0002																0.000212			
NaOH		1	0.0004																		0.0004	
HCl	38%	8	0.0033					0.002												0.001		
H2O2	63%	2	0.0006				0.0003	0.0002														
Acetic acid		2	0.0005																			6E-04

H₂O₂
30%

A/N 511739

Basic
Specific density
Volume of water
Weight per cent of water
Weight per cent of H₂O₂

1 gal
1.11
0.7 gal
63%
37%

**ATTACHMENT
Mixed Acids
Storage Tank
T-14
Horizontal**

Previous: G8267 503225 A/N 511741

Given:

Tank dimensions:	ft	in	
DIA.	10	0	6,757 gallons
L	11	6	
Annual throughput:			4,800,000 gallons
Molecular weights			
Vapors			43.84
Cr ⁺⁶			51.94
CrO ₃			99.94
Month selected for emission calculations:			July
Number of days in the selected month:			31
Total vapor pressure:			0.72 psia
Molecular weight of vapors			43.98 lb/lbmole
Maximum month emission*			
Working			63.04 lb/month
Breathing			3.54 lb/month
<u>Note: *From TANK 4.0.9d Emissions Report</u>			
Control efficiency:			
Acid PM			95%
Acetic acid			95%
PM in dragouts			0%
VOC			0%
Operating Schedule:			
hrs/day			24 hrs/day
days/wk			7 days/wk
weeks/yr			52 wks/yr
PM10 in Total PM:			96%
Total emissions (excluding water)			79.17%
PM in total loss (working + breathing)			38.07%
HF in PM			0.12%
H2SO4 in PM			0.01%
HNO ₃ in PM			0.01%
HCl in PM			0.0001%
H3PO4 in PM			0.23%
Ethylene glycol monobutyl ether in total emissions (excluding water)			0.51%
Acetic acid in total emissions (excluding water)			40.59%
HF4 in PM			47.71%
Weight % of copper in tank			0.00007%

**ATTACHMENT
Mixed Acids
Storage Tank
T-14**

Weight % of chromic acid in tank 0.00008%

Note: Copper and CrO₃, solid, are dissolved in water. Their losses are due to dragouts which are small. The worst case will be that the weight concentrations of copper and CrO₃ in the vapors

Calculations

Tank volume: 6,750 gallons
Turnovers per year 711

Emissions:

Total loss (Working + breathing) (63.04 + 3.54) lb/month = 66.58 lb/month
66.58 lb/month/31 days/month = 2.1477 lb/day

Total emission 66.58 lb/month*0.7917 = 52.71 lb/month
(Uncontrolled, excluding water) 52.71 lb/month/31 days/month = 1.70 lb/day

PM :

lb/day
Uncontrolled 2.15 lb/day*0.3807 = 0.82 lb/day
Controlled 0.82 lb/day*(1-0.95) = 0.04 lb/day

lb/hr
Uncontrolled 0.82 lb/day/24 hrs/day = 0.03 lb/hr
Controlled 0.04 lb/day/24 hrs/day = 0.002 lb/hr

lb/yr 0.04 lb/day*7 days/wk*52 wks/yr = 14.88 lb/yr

PM10

lb/day
Uncontrolled 0.82 lb/day*0.96 = 0.78 lb/day
Controlled 0.04 lb/day*0.96 = 0.04 lb/day

lb/hr
Uncontrolled 0.03 lb/day*0.96 = 0.03 lb/hr
Controlled 0.002 lb/day*0.96 = 0.002 lb/hr

lb/yr 0.04 lb/day*7 days/wk*52 wks/yr = 14.28 lb/yr

HF:

lb/day
Uncontrolled 0.82 lb/day*0.0012 = 0.0010 lb/day
Controlled 0.04 lb/day*0.0012 = 0.00005 lb/day

lb/hr
Uncontrolled 0.03 lb/hr*0.0012 = 0.000042 lb/hr
Controlled 0.002 lb/hr*0.0012 = 0.0000021 lb/hr

lb/yr 14.88 lb/yr*0.0012 = 0.02 lb/yr

ATTACHMENT
Mixed Acids
Storage Tank
T-14

H₂SO₄:		
lb/day		
Uncontrolled	0.82 lb/day*0.0001 =	0.0001 lb/day
Controlled	0.04 lb/day*0.0001 =	0.000004 lb/day
lb/hr		
Uncontrolled	0.03 lb/hr*0.0001 =	0.00000 lb/hr
Controlled	0.002 lb/hr*0.0001 =	0.000000 lb/hr
lb/yr	14.88 lb/yr*0.0001 =	0.002 lb/yr
HNO₃:		
lb/day		
Uncontrolled	0.82 lb/day*0.0001 =	0.0001 lb/day
Controlled	0.04 lb/day*0.0001 =	0.00000000 lb/day
lb/hr		
Uncontrolled	0.03407 lb/hr*0.000 =	0.000003 lb/hr
Controlled	0.001703 lb/hr*0.000 =	0.0000001 lb/hr
lb/yr	14.880 lb/yr*0.000 =	0.0012 lb/yr
HCl:		
lb/day		
Uncontrolled	0.8176 lb/day*0.000001 =	0.0000007 lb/day
Controlled	0.04088 lb/day*0.000001 =	0.0000000000 lb/day
lb/hr		
Uncontrolled	0.03 lb/hr*0.000001 =	0.00000003 lb/hr
Controlled	0.002 lb/hr*0.000001 =	0.000000001 lb/hr
lb/yr	14.88 lb/yr*0.0000 =	0.00001 lb/yr
H₃PO₄:		
lb/day		
Uncontrolled	0.82 lb/day*0.0023 =	0.0019 lb/day
Controlled	0.04 lb/day*0.0023 =	0.00000000001 lb/day
lb/hr		
Uncontrolled	0.03 lb/hr*0.0023 =	0.00008 lb/hr
Controlled	0.002 lb/hr*0.0023 =	0.000004 lb/hr
lb/yr	14.88 lb/yr*0.0023 =	0.03 lb/yr
HBF₄		
lb/day		
Uncontrolled	0.82 lb/day*0.4771 =	0.39 lb/day
Controlled	0.04 lb/day*0.4771 =	0.02 lb/day
lb/hr		
Uncontrolled	0.03 lb/hr*0.0023 =	0.00008 lb/hr
Controlled	0.002 lb/hr*0.0023 =	0.000004 lb/hr
lb/yr	14.88 lb/yr*0.0023 =	0.03 lb/yr

ATTACHMENT

Mixed Acids

Storage Tank

T-14

Copper

lb/day

Uncontrolled

$$2.15 \text{ lb/day} * 0.0000008 = 1.8\text{E-}06 \text{ lb/day}$$

Controlled

$$0.00000177 \text{ lb/day} * (1-0) = 1.77\text{E-}06 \text{ lb/day}$$

lb/hr

Uncontrolled

$$0.00000177 \text{ lb/day} / 24 \text{ hrs/day} = 7.39\text{E-}08 \text{ lb/hr}$$

Controlled

$$0.000001775 \text{ lb/day} / 24 \text{ hrs/day} = 7.39\text{E-}08 \text{ lb/hr}$$

lb/yr

$$0.000001775 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 6.46\text{E-}04 \text{ lb/yr}$$

Cr⁺⁶

lb/day

Uncontrolled

$$2.15 \text{ lb/day} * 0.000001 * 51.94 \text{ lb Cr/lbmole} / 99.94 \text{ lb CrO}_3/\text{lbmole} = 9.2\text{E-}07 \text{ lb/day}$$

Controlled

$$0.00000092 \text{ lb/day} * (1-0) = 9.22\text{E-}07 \text{ lb/day}$$

lb/hr

Uncontrolled

$$0.00000092 \text{ lb/day} / 24 \text{ hrs/day} = 3.84\text{E-}08 \text{ lb/hr}$$

Controlled

$$0.000000922 \text{ lb/day} / 24 \text{ hrs/day} = 3.84\text{E-}08 \text{ lb/hr}$$

lb/yr

$$0.000000922 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 3.36\text{E-}04 \text{ lb/yr}$$

Ethylene glycol monobutyl ether (EGME)

lb/day

Uncontrolled

$$1.7003 \text{ lb/day} * 0.0051 = 0.009 \text{ lb/day}$$

Controlled

$$0.009 \text{ lb/day} * (1-0) = 0.009 \text{ lb/day}$$

lb/hr

Uncontrolled

$$0.009 \text{ lb/day} / 24 \text{ hrs/day} = 0.0004 \text{ lb/hr}$$

Controlled

$$0.009 \text{ lb/day} / 24 \text{ hrs/day} = 0.0004 \text{ lb/hr}$$

lb/yr

$$0.009 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 3.15 \text{ lb/yr}$$

Acetic acid (CH₃COOH)

lb/day

Uncontrolled

$$1.7003 \text{ lb/day} * 0.4059 = 0.69 \text{ lb/day}$$

Controlled

$$0.69 \text{ lb/day} * (1-0.95) = 0.03 \text{ lb/day}$$

lb/hr

Uncontrolled

$$0.69 \text{ lb/day} / 24 \text{ hrs/day} = 0.03 \text{ lb/hr}$$

Controlled

$$0.03 \text{ lb/day} / 24 \text{ hrs/day} = 0.0014 \text{ lb/hr}$$

lb/yr

$$0.03 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 12.56 \text{ lb/yr}$$

ATTACHMENT
Mixed Acids
Storage Tank
T-14

	PM	PM10	HF	H ₂ SO ₄	HNO ₃	HCl	H ₃ PO ₄	HBF ₄
lb/hr								
Uncontr.	0.03	0.03	4.23E-05	3.89E-06	2.66E-06	2.76E-08	0.002	7.77E-05
Contr.	0.002	0.002	2.12E-06	1.94E-07	1.33E-07	1.38E-09	0.0000	3.89E-06
lb/day								
Uncontr.	0.82	0.78	1.02E-03	9.34E-05	6.38E-05	6.62E-07	0.0001	0.39
Contr.	0.04	0.04	5.08E-05	4.48E-06	3.97E-09	3.63E-12	0.000004	0.02
lb/yr (Contr.)		14.285	0.018	0.0017	0.0012	0.000012	0.03	0.03

	Copper	Cr ⁺⁶	EGME	CH ₃ COOH	VOC
lb/hr					
Uncontr.	7.39E-08	3.84E-08	0.0004	0.03	0.03
Contr.	7.39E-08	3.84E-08	0.0004	0.001	0.002
lb/day					
Uncontr.	1.77E-06	9.22E-07	0.009	0.69	0.70
Contr.	1.77E-06	9.22E-07	0.009	0.03	0.04
lb/yr (Contr.)	6.46E-04	3.36E-04	3.15	12.561	15.708

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	50
Receptor Distance (for X/Q LOOKUP)	50

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
5.72E-01	3.85E-05
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Hydrogen fluoride (hydrofluoric acid)	1.85E-02	2.12E-06		2.40E-01		8.82E-06
Sulfuric acid (and oleum)	1.70E-03	1.94E-07	8.67E+01	1.20E-01	1.96E-05	1.62E-06
Nitric acid	1.16E-03	1.33E-07		8.59E-02		1.55E-06
Hydrogen chloride (hydrochloric acid)	1.21E-05	1.38E-09	7.80E+02	2.10E+00	1.55E-08	6.58E-10
Phosphoric acid	7.91E-08	9.05E-12	6.07E+02		1.30E-10	
Copper and copper compounds	6.46E-04	7.39E-08		9.99E-02		7.40E-07
Chromic trioxide (as chromic acid mist)	3.36E-04	3.84E-08	5.87E-04		5.72E-01	
Ethylene glycol monobutyl ether	3.15E+00	3.60E-04		1.40E+01		2.57E-05
TOTAL (APPLICATION SCREENING INDEX)					5.72E-01	3.85E-05

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: T-14 8 2 10
City:
State:
Company:
Type of Tank: Horizontal Tank
Description:

Tank Dimensions

Shell Length (ft): 11.50
Diameter (ft): 10.00
Volume (gallons): 6,750.00
Turnovers: 711.00
Net Throughput(gal/yr): 4,804,227.60
Is Tank Heated (y/n): N
Is Tank Underground (y/n): N

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition: Good

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-14 8 2 10 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Boels for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Mixed acids	Jul	71.26	65.04	77.47	64.33	0.7200	0.7200	0.7200	43.9800			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-14 8 2 10 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb)							3.5398					
Vapor Space Volume (cu ft)							575.2916					
Vapor Density (lb/cu ft)							0.0056					
Vapor Space Expansion Factor							0.0425					
Vented Vapor Saturation Factor							0.8398					
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft)							575.2916					
Tank Diameter (ft)							10.0000					
Effective Diameter (ft)							12.1038					
Vapor Space Outage (ft)							5.0000					
Tank Shell Length (ft)							11.5000					
Vapor Density												
Vapor Density (lb/cu ft)							0.0056					
Vapor Molecular Weight (lb/lb-mole)							43.9800					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)							0.7200					
Daily Avg. Liquid Surface Temp. (deg. R)							530.9285					
Daily Average Ambient Temp. (deg. F)							73.0500					
Ideal Gas Constant R (psia-cuft / lb-mol-deg R)							10.731					
Liquid Bulk Temperature (deg. R)							523.9963					
Tank Paint Solar Absorptance (Shell)							0.1700					
Daily Total Solar Insulation Factor (Btu/sq ft day)							2,302.7457					
Vapor Space Expansion Factor												
Vapor Space Expansion Factor							0.0425					
Daily Vapor Temperature Range (deg. R)							24.8571					
Daily Vapor Pressure Range (psia)							0.0000					
Breather Vent Press. Setting Range (psia)							0.0800					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)							0.7200					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia)							0.7200					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)							0.7200					
Daily Avg. Liquid Surface Temp. (deg. R)							530.9285					
Daily Min. Liquid Surface Temp. (deg. R)							524.7142					
Daily Max. Liquid Surface Temp. (deg. R)							537.1427					
Daily Ambient Temp. Range (deg. R)							19.3000					
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor							0.8398					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)							0.7200					
Vapor Space Outage (ft)							5.0000					
Working Losses (lb)												
Working Losses (lb)							63.0431					
Vapor Molecular Weight (lb/lb-mole)							43.9800					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia)							0.7200					
Net Throughput (gal/mo)							400,352.2500					
Annual Turnovers							711.0000					
Turnover Factor							0.2059					
Tank Diameter (ft)							10.0000					
Working Loss Product Factor							1.0000					
Total Losses (lb)							66.5830					

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

T-14 8 2 10 - Horizontal Tank

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Mixed acids	63.04	3.54	66.58

Mixture Vapor Pressure

T-14

Mixed Acids

Previous: Permit G8267 503225

A/N: 511741

Operating temperature

70 F

pH

2.5

Compounds	Solution wt%	VP mmHg	Molecular Weight	moles fraction	Weight Contribution	Weight %	
						W/ Water	W/o Water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)
H ₃ PO ₄	0.252%	0.0300	98.00	0.001	0.08	0.18%	0.23%
Acetic acid	0.032%	11.00	60.05	0.297	17.85	40.59%	51.27%
HNO ₃	0.126%	0.0016	63.01	0.00004	0.003	0.01%	0.01%
HBF ₄	0.003%	7.0000	87.81	0.18918	16.612	37.77%	47.71%
HF	0.06%	0.08	20.01	0.0022	0.04	0.10%	0.12%
H ₂ O ₂	0.19%	-	34.01	-	-	-	-
H ₂ SO ₄	2.43%	0.0015	98.07	0.0000	0.004	0.01%	0.01%
NH ₄ OH	0.014%	-	17.03	-	-	-	-
NH ₄ F (Solid sa	0.08%	-	37.04	-	-	-	-
HCl	0.028%	0.00003	36.46	0.000001	0.00003	0.0001%	0.0001%
Chromic acid	0.00008%	-	155.82	-	-	-	-
Copper	0.00007%	-	63.55	-	-	-	-
Ethylene glycol	0.001%	-	62.07	-	-	-	-
Ethylene glycol monobutyl ether	0.001%	0.0700	118.18	0.002	0.22	0.51%	0.64%
Hydrazine 35% (H ₂ N ₂ H ₂ ·H ₂ O)	0.0001%	-	32.05	-	-	-	-
KOH	0.0001%	-	56.11	-	-	-	-
Iodine (From KI)	0.0001%	-	253.81	-	-	-	-
Choline hydroxide	0.0001%	-	121.18	-	-	-	-
NaOH	2.339%	-	40.00	-	-	-	-
H ₂ O	94.45%	18.8	18.02	0.5086	9.16	20.83%	-
	100%	37.00			43.98	100%	100%
	psia	0.72					
					W/o water	79.17%	
					W/o water, acetic acid & ether (PM)	38.07%	

A/N 511741

Desired throughput 2,410,000 gals/month
 4,800,000 gals/yr

Assumption: Effects of interactions between acids are minimum.

Vapor pressure of each component in aqueous solution (as if it is the only component in water) is used.

For water, vapor pressure of pure water is used.

For HF, the vapor pressure is that of 5% HF solution

For H₂SO₄, total vapor pressure of 95% H₂SO₄ at 35 C (95 F) is used.

For H₃PO₄, vapor pressure of 10% H₃PO₄ at 20 C (68 F) is used.

Copper emissions due to dragouts are minimal.

It is believed that vapor pressure of 0.001% ethylene glycol monobutyl ether is less than 10% of that of pure ethylene glycol monobutyl ether (0.7 mm Hg)

Choline hydroxide (C₅H₁₅NO₂) and ethylene glycol (HOCH₂CH₂OH) concentrations are very low, their vapor pressures are also low. Therefore, their emissions are negligible and will not be calculated.

Iodine concentration is very low. Therefore, it is believed that its emission is minimal and will not be calculated.

Chromic acid, CrO₃, is solid. Its emission, from dragouts, is low.

At 2.5 pH, it is expected that all hydrazine, NH₄OH, KOH and NaOH are completely neutralized.

**ATTACMENT
T-151
Buffered Oxide Etch
Vertical**

Previous: G1995 460729 A/N: 511742

Given:

Tank dimentior	ft	in	gals
DIA.	4	6	654
H	5	6	

Working volume	654 gals
Desired throughput:	36,000 gals/yr
Turnovers per year	55
Month selected for emission calculations:	July
Number of days in July:	31
Total pressure:	0.63 psia
Maximum emissions**	
Working	0.60 lb/month
Breathing	0.20 lb/month
<u>Note:</u> **From TANK 4.0.9d Emissions Report	0.8
Weight% of PM in vapor:	45.24%
Molecular weight of vapors	18.86 lb/lbmole
Control efficiency:	95%
Operating Schedule:	
hrs/day	24 hrs/day
days/wk	7 days/wk
weeks/yr	52 wks/yr
PM10 in PM	96%

Calculations:

Emissions:

Total emission (working + breathing), lb/month $(0.6 + 0.2) \text{ lb/month} = 0.80 \text{ lb/month}$

PM/HF

lb/day

Uncontrolled	$0.80 \text{ lb/month} / 31 \text{ days/month} * 0.4524 =$	0.012 lb/day
Controlled	$0.012 \text{ lb/day} * (1 - 0.95) =$	0.0006 lb/day

lb/hr

Uncontrolled	$0.012 \text{ lb/day} / 24 \text{ hrs/day} =$	0.0005 lb/hr
Controlled	$0.0006 \text{ lb/day} / 24 \text{ hrs/day} =$	0.00002 lb/hr

lb/yr

$0.0006 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 0.21 \text{ lb/yr}$

PM10

lb/day

Uncontrolled	$0.01 \text{ lb/day} * 0.96 =$	0.01 lb/day
Controlled	$0.0006 \text{ lb/day} * 0.96 =$	0.00056 lb/day

lb/hr

Uncontrolled	$0.0005 \text{ lb/day} * 0.96 =$	0.0005 lb/hr
Controlled	$0.00002 \text{ lb/day} * 0.96 =$	0.00002 lb/hr

lb/yr

$0.00056 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 0.20 \text{ lb/yr}$

	PM	PM10	HF
lb/hr			
Uncontr.	4.86E-04	4.67E-04	4.86E-04
Contr.	5.84E-04	2.34E-05	2.43E-05
lb/day			
Uncontr.	4.86E-04	1.12E-02	1.17E-02
Contr.	4.86E-04	5.60E-04	5.84E-04
lb/yr (Contr.)		0.20	0.21

Monthly throughput limit:

3,000 gals/month

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	50
Receptor Distance (for X/Q LOOKUP)	50

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
PASSED	1.01E-04 PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Hydrogen fluoride (hydrofluoric acid)	2.12E-01	2.43E-05		2.40E-01		1.01E-04

TOTAL (APPLICATION SCREENING INDEX)

1.01E-04

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: T-151 7 24 10
 City:
 State:
 Company:
 Type of Tank: Vertical Fixed Roof Tank
 Description:

Tank Dimensions

Shell Height (ft): 5.50
 Diameter (ft): 4.50
 Liquid Height (ft): 5.50
 Avg. Liquid Height (ft): 2.70
 Volume (gallons): 654.35
 Turnovers: 55.00
 Net Throughput(gal/yr): 35,989.31
 Is Tank Heated (y/n): N

Paint Characteristics

Shell Color/Shade: White/White
 Shell Condition: Good
 Roof Color/Shade: White/White
 Roof Condition: Good

Roof Characteristics

Type: Cone
 Height (ft): 0.00
 Slope (ft/ft) (Cone Roof): 0.00

Breather Vent Settings

Vacuum Settings (psig): -0.03
 Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-151 7 24 10 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Buffer Oxide Etch	Jul	71.26	65.04	77.47	64.33	0.6300	0.6300	0.6300	18.8900			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-151 7 24 10 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb)							0.1120					
Vapor Space Volume (cu ft)							44.5321					
Vapor Density (lb/cu ft)							0.0021					
Vapor Space Expansion Factor:							0.0426					
Vented Vapor Saturation Factor:							0.9145					
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft)							44.5321					
Tank Diameter (ft)							4.5000					
Vapor Space Outage (ft)							2.8000					
Tank Shell Height (ft)							5.5000					
Average Liquid Height (ft)							2.7000					
Roof Outage (ft)							0.0000					
Roof Outage (Cone Roof)												
Roof Outage (ft)							0.0000					
Roof Height (ft)							0.0000					
Roof Slope (ft/ft)							0.0000					
Shell Radius (ft)							2.2500					
Vapor Density												
Vapor Density (lb/cu ft)							0.0021					
Vapor Molecular Weight (lb/lb-mole)							18.8600					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6300					
Daily Avg. Liquid Surface Temp. (deg R)							530.8285					
Daily Average Ambient Temp. (deg F)							73.0500					
Ideal Gas Constant R							10.731					
(psia cu ft / (lb-mol-deg R)):							523.8983					
Liquid Bulk Temperature (deg R)							0.1700					
Tank Paint Solar Absorptance (Shell):							0.1700					
Daily Total Solar Insulation Factor (Btu/ft ² day)							2,302.7457					
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:							0.0426					
Daily Vapor Temperature Range (deg R)							24.8571					
Daily Vapor Pressure Range (psia):							0.0000					
Breather Vent Press. Setting Range (psia):							0.0600					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6300					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.6300					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.6300					
Daily Avg. Liquid Surface Temp. (deg R)							530.8285					
Daily Min. Liquid Surface Temp. (deg R)							524.7142					
Daily Max. Liquid Surface Temp. (deg R)							537.1427					
Daily Ambient Temp. Range (deg R)							19.3000					
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:							0.9145					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6300					
Vapor Space Outage (ft)							2.8000					
Working Losses (lb):												
Vapor Molecular Weight (lb/lb-mole)							0.6042					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							18.8600					
Net Throughput (gal/mo)							0.6300					
Annual Turnovers							2,099.1089					
Turnover Factor:							55.0000					
Maximum Liquid Volume (gal):							0.7121					
Maximum Liquid Height (ft):							854.3510					
Tank Diameter (ft)							5.5000					
Working Loss Product Factor:							4.5000					
							1.0000					
Total Losses (lb):							0.7162					

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

T-151 7 24 10 - Vertical Fixed Roof Tank

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Buffer Oxide Etch	0.60	0.11	0.72

Previous:

G1995 460729

A/N:

511742

**Mixture Vapor Pressure
T-151
Buffered Oxide Etch
70 F**

Operating temperature

Compounds	Amount, lb	Solution wt%	Molecular Weight	VP mmHg	moles fraction	Weight Contribution	w/ water	W/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HF	11	11%	20.01	14.00	0.4265897	8.53	45.24%	100%
NH ₄ F	40	40%	37.04	-	-	-	0%	0%
Water	49	49%	18.02	18.8	0.5734103	10.33	54.76%	-
	100	100%		32.82	1.000000	18.86	100%	100%
				psia 0.63				

Desired throughput

3,000 gals/month
36,000 gals/yr

L = Liquid

**ATTACMENT
T-155
Hydrochloric Acid
Vertical**

Previous: G1996 460730 A/N: 511744

Given:

Tank dimentior	ft	in	gals
DIA.	4	6	654
H	5	6	

Working volume	654 gals
Desired throughput:	12,000 gals/yr
Turnovers per year	18
Month selected for emission calculations:	July
Number of days in July:	31
Total pressure:	0.94 psia
Maximum emissions**	
Working	0.64 lb/month
Breathing	0.25 lb/month
Note: **From TANK 4.0.9d Emissions Report	0.89
Weight% of PM in vapor:	76.34%
Molecular weight of vapors	29.35
Control efficiency:	95%
Operating Schedule:	
hrs/day	24 hrs/day
days/wk	7 days/wk
weeks/yr	52 wks/yr
PM10 in PM	96%

Calculations:

Emissions:

Total emission (working + breathing), lb/month $(0.64 + 0.25) \text{ lb/month} =$ 0.89 lb/month

PM/HNO₃

lb/day

 Uncontrolled $0.89 \text{ lb/month} / 31 \text{ days/month} * 0.7634 =$ 0.022 lb/day

 Controlled $0.022 \text{ lb/day} * (1-7) =$ 0.0011 lb/day

lb/hr

 Uncontrolled $0.022 \text{ lb/day} / \text{hrs/day} =$ 0.0009 lb/hr

 Controlled $0.0011 \text{ lb/day} / \text{hrs/day} =$ 0.00005 lb/hr

lb/yr

$0.0011 \text{ lb/day} * \text{days/wk} * 0.89 \text{ wks/yr} =$ 0.40 lb/yr

PM10

lb/day

 Uncontrolled $0.02 \text{ lb/day} * 0.96 =$ 0.02 lb/day

 Controlled $0.0011 \text{ lb/day} * 0.96 =$ 0.0011 lb/day

lb/hr

 Uncontrolled $0.0009 \text{ lb/day} * 0.96 =$ 0.0009 lb/hr

 Controlled $0.00005 \text{ lb/day} * 0.96 =$ 0.00004 lb/hr

lb/yr

$0.0011 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} =$ 0.38 lb/yr

	PM	PM10	HNO ₃
lb/hr			
Uncontr.	9.13E-04	8.77E-04	9.13E-04
Contr.	4.57E-05	4.38E-05	4.57E-05
lb/day			
Uncontr.	2.19E-02	2.10E-02	2.19E-02
Contr.	1.10E-03	1.05E-03	1.10E-03
lb/yr (Contr.)		0.38	0.40

Monthly throughput limit:

1,000 gals/month

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	50
Receptor Distance (for X/Q LOOKUP)	50

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
PASSED	5.31E-04 PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Nitric acid	3.99E-01	4.57E-05		8.59E-02		5.31E-04
TOTAL (APPLICATION SCREENING INDEX)						5.31E-04

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: T-155 7 24 10
City:
State:
Company:
Type of Tank: Vertical Fixed Roof Tank
Description:

Tank Dimensions

Shell Height (ft): 5.50
Diameter (ft): 4.50
Liquid Height (ft): 5.50
Avg. Liquid Height (ft): 2.70
Volume (gallons): 654.35
Turnovers: 18.00
Net Throughput(gal/yr): 11,778.32
Is Tank Heated (y/n): N

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition: Good
Roof Color/Shade: White/White
Roof Condition: Good

Roof Characteristics

Type: Cone
Height (ft): 0.00
Slope (ft/ft) (Cone Roof): 0.00

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-155 7 24 10 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
HCl 38	Jul	71.28	65.04	77.47	64.33	0.9400	0.9400	0.9400	28.3500			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-155 7 24 10 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):							0.2491					
Vapor Space Volume (cu ft):							44.5321					
Vapor Density (lb/cu ft):							0.0048					
Vapor Space Expansion Factor:							0.0425					
Vented Vapor Saturation Factor:							0.8778					
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):							44.5321					
Tank Diameter (ft):							4.5000					
Vapor Space Outage (ft):							2.8000					
Tank Shell Height (ft):							5.5000					
Average Liquid Height (ft):							2.7000					
Roof Outage (ft):							0.0000					
Roof Outage (Cone Roof)												
Roof Outage (ft):							0.0000					
Roof Height (ft):							0.0000					
Roof Slope (ft/ft):							0.0000					
Shell Radius (ft):							2.2500					
Vapor Density												
Vapor Density (lb/cu ft):							0.0048					
Vapor Molecular Weight (lb/lb-mole):							29.3500					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.9400					
Daily Avg. Liquid Surface Temp. (deg. R):							530.8285					
Daily Average Ambient Temp. (deg. F):							73.0500					
Ideal Gas Constant R (psia cu ft / lb-mol-deg R):							10.731					
Liquid Bulk Temperature (deg. R):							523.9983					
Tank Paint Solar Absorptance (Shell):							0.1700					
Tank Paint Solar Absorptance (Roof):							0.1700					
Daily Total Solar Insulation Factor (Btu/sq ft day):							2,302.7457					
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:							0.0425					
Daily Vapor Temperature Range (deg. R):							24.8571					
Daily Vapor Pressure Range (psia):							0.0000					
Breather Vent Press. Setting Range (psia):							0.0600					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.9400					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.9400					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.9400					
Daily Avg. Liquid Surface Temp. (deg. R):							530.8285					
Daily Min. Liquid Surface Temp. (deg. R):							524.7142					
Daily Max. Liquid Surface Temp. (deg. R):							537.1427					
Daily Ambient Temp. Range (deg. R):							19.3000					
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:							0.8778					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.9400					
Vapor Space Outage (ft):							2.8000					
Working Losses (lb):							0.6447					
Vapor Molecular Weight (lb/lb-mole):							29.3500					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.9400					
Net Throughput (gal/mo.):							981.5268					
Annual Turnovers:							18.0000					
Turnover Factor:							1.0000					
Maximum Liquid Volume (gal):							654.3510					
Maximum Liquid Height (ft):							5.5000					
Tank Diameter (ft):							4.5000					
Working Loss Product Factor:							1.0000					
Total Losses (lb):							0.8938					

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: July

T-155 7 24 10 - Vertical Fixed Roof Tank

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
HCl 38	0.64	0.25	0.89

Previous:

G1996 460730

A/N:

511744

Mixture Vapor Pressure

T-155

Hydrochloric Acid

70 F

Operating temperature

Compounds	Amount, lb	Solution wt%	Molecular Weight	VP mmHg	moles fraction	Weight Contribution	w/ water	W/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HCl	38	38%	36.46	30.0	0.61	22.41	76.34%	100%
Water	62	62%	18.02	18.8	0.39	6.94	23.66%	-
	100	100%		48.82	1.00	29.35	100%	100%
			psia	0.94				

Desired throughput

1,000 gals/month
12,000 gals/yr

**ATTACMENT
T-141
Dilute Hydrofluoric Acid
Horizontal**

Previous: G1994 460728 A/N: 511745

Given:

Tank dimentior	ft	in	gals
DIA.	7	0	5,902
L	20	6	

Working volume	5,902 gals
Desired throughput:	360,000 gals/yr
Turnovers per year	61.00

Month selected for emission calculations:	July
Number of days in July:	31
Total vapor pressure:	0.37 psia
Maximum emissions**	
Working	3.14 lb/month
Breathing	0.73 lb/month

Note: **From TANK 4.0.9d Emissions Report

Weight fraction of all acids in vapor:	0.0047
Molecular weight of vapors	18.02
Control efficiency:	
PM acids	95%
Acetic acid	0%
Operating Schedule:	
hrs/day	24 hrs/day
days/wk	7 days/wk
weeks/yr	52 wks/yr
PM10 in PM	96%

Calculations:

Emissions:

Total emission (working + breathing), lb/month $(3.14 + 0.73) \text{ lb/month} =$ 3.87 lb/month

PM/HF

Uncontrolled	$3.87 \text{ lb/month} / 31 \text{ days/month} * 0.0047 =$	0.001 lb/day
Controlled	$0.001 \text{ lb/day} * (1 - 0.95) =$	0.00003 lb/day

lb/hr

Uncontrolled	$0.001 \text{ lb/day} / 24 \text{ hrs/day} =$	0.00002 lb/hr
Controlled	$0.00003 \text{ lb/day} / 24 \text{ hrs/day} =$	0.000001 lb/hr

lb/yr

	$0.00003 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} =$	0.01 lb/yr
--	--	------------

PM10

lb/day

Uncontrolled	$0.001 \text{ lb/day} * 0.96 =$	0.001 lb/day
Controlled	$0.00003 \text{ lb/day} * 0.96 =$	0.00003 lb/day

lb/hr

Uncontrolled	$0.00002 \text{ lb/day} * 0.96 =$	0.00002 lb/hr
Controlled	$0.000001 \text{ lb/day} * 0.96 =$	0.000001 lb/hr

lb/yr

	$0.00003 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} =$	0.01 lb/yr
--	--	------------

	PM	PM10	HF
lb/hr			
Uncontr.	2.44E-05	2.35E-05	2.44E-05
Contr.	1.22E-06	1.17E-06	1.22E-06
lb/day			
Uncontr.	5.87E-04	5.63E-04	5.87E-04
Contr.	2.93E-05	2.82E-05	2.93E-05
lb/yr (Contr.)		0.01	0.01

Monthly throughput limit: 5,902 gals*61.00 times/yr/12 months/yr = 30,000 gals/month

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	50
Receptor Distance (for X/Q LOOKUP)	50

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Fluorides and fluoride compounds*	1.07E-02	1.22E-06				
TOTAL (APPLICATION SCREENING INDEX)						

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: T-141 7 26 10
City:
State:
Company:
Type of Tank: Horizontal Tank
Description:

Tank Dimensions

Shell Length (ft): 20.50
Diameter (ft): 7.00
Volume (gallons): 5,900.00
Turnovers: 61.00
Net Throughput(gal/yr): 359,900.00
Is Tank Heated (y/n): N
Is Tank Underground (y/n): N

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition: Good

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-141 7 26 10 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Mixed Acids	Jul	71.26	65.04	77.47	64.33	0.3700	0.3700	0.3700	18.0200			0.00	

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-141 7 26 10 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):							0.7273					
Vapor Space Volume (cu ft):							502.5047					
Vapor Density (lb/cu ft):							0.0012					
Vapor Space Expansion Factor:							0.0426					
Vented Vapor Saturation Factor:							0.9358					
Tank Vapor Space Volume:							502.5047					
Vapor Space Volume (cu ft):							7.0000					
Tank Diameter (ft):							13.5204					
Effective Diameter (ft):							3.5000					
Vapor Space Outage (ft):							20.5000					
Tank Shell Length (ft):												
Vapor Density:							0.0012					
Vapor Density (lb/cu ft):							18.0200					
Vapor Molecular Weight (lb/lb-mole):												
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3700					
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285					
Daily Average Ambient Temp. (deg. F):							73.0500					
Ideal Gas Constant R (psia-cuft / (lb-mol-deg R)):							10.731					
Liquid Bulk Temperature (deg. R):							523.9983					
Tank Paint Solar Absorptance (Shell):							0.1700					
Daily Total Solar Insulation Factor (Btu/ft ² day):							2,302.7457					
Vapor Space Expansion Factor:							0.0426					
Vapor Space Expansion Factor (deg. R):							24.9571					
Daily Vapor Temperature Range (psia):							0.0000					
Daily Vapor Pressure Range (psia):							0.0600					
Broather Vent Press. Setting Range (psia):												
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3700					
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.3700					
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.3700					
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285					
Daily Min. Liquid Surface Temp. (deg. R):							524.7142					
Daily Max. Liquid Surface Temp. (deg. R):							537.1427					
Daily Ambient Temp. Range (deg. R):							19.3000					
Vented Vapor Saturation Factor:							0.9358					
Vented Vapor Saturation Factor:							0.3700					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							3.5000					
Vapor Space Outage (ft):												
Working Losses (lb):							3.1350					
Vapor Molecular Weight (lb/lb-mole):							18.0200					
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3700					
Net Throughput (gal/mo.):							29,991.6667					
Annual Turnovers:							61.0000					
Turnover Factor:							0.8585					
Tank Diameter (ft):							7.0000					
Working Loss Product Factor:							1.0000					
Total Losses (lb):							3.8623					

**TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals**

Emissions Report for: July

T-141 7 26 10 - Horizontal Tank

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Mixed Acids	3.14	0.73	3.86

Previous:

G1994 460728

A/N:

511745

**Mixture Vapor Pressure
T-141
Dilute Hydrofluoric Acid**

Operating temperature

70 F

Compounds	Amount, lb	wt% in compound	Weight (pure), lb	Solution wt%	Molecular Weight	VP mmHg	moles fraction	Weight Contribution	w/ water	W/o water
Columns	(1)			(2)	(3)	(4)	(5)	(6)	(7)	(8)
HF	1	49%	0.49	0.49%	20.01	0.08	0.0042332	0.08	0.47%	100%
Water	99	100%	99.00	99.51%	18.02	18.8	0.9957668	17.94	99.53%	-
	100		99.49	100.00%		18.90	1.000000	18.0236	100%	100%
						psia 0.37				

Desired throughput 30,000 gals/month
 360,000 gals/yr

Vapor pressure of 5% HF is used

ATTACHMENT
Wafer Etching and Stripping Line 3

A/N 511746

Previous: None

Given:

Wind speed U (Applicant's data) 1.7 mph
 $1.7 \text{ mph} * 5280 \text{ ft/mile} / 60 \text{ minutes/hr} = 149.60 \text{ fpm}$
 $149.60 \text{ fpm} / 60 \text{ seconds/minute} = 2.493 \text{ ft/sec}$

Gas-phase mass transfer coefficient K, ft/sec⁽¹⁾
 $K = 0.00438 * U^{0.78} * (18/MW)^{1/3}$
 Where: MW = Molecular weight, lb/lbmole

Evaporation rate W, lb/sec⁽¹⁾
 $W = (MW * K * A * VP) / (R * (T + 460))$
 Where: A = Tank surface area, ft²
 VP = Vapor pressure of chemical
 R = Ideal gas constant
 = 10.73 psia*ft³/°R*lbmole
 T = Operating temperature, F

⁽¹⁾ Source: Preferred and Alternate Methods for Estimating Air Emissions from Semiconductor Manufacturing, Volume II: Chapter 6 (Prepared by Eastern Research Group, Inc. for Point Sources Committee of the Emission Inventory Improvement Program and EPA's Emission Factor and Inventory Group).

Control efficiencies:
 Scrubber (Acids) 95%
 Oxidizer (VOC): 0%

Note: Tank 6 vents to an oxidizer. However, because we don't know how much IPA emitted and controlled by the oxidizer, and how much IPA remains in the water (uncontrolled), for permit processing purposes, we will use 100% IPA as being remained in the water (0% control efficiency).

Operating schedule:
 hrs/day 24 hrs/day
 days/wk 7 days/wk
 wks/yr 52 wks/yr
 PM10 factor: 96%

Tank 1:
 Dimensions: ft inches
 W 0 9.5
 L 1 4.5
 H 0 11.5

This tank will start using BOE etchant. It will switch to Ultra Etch LFE 600 NP. If it is later found that Ultra Etch does not perform well, BOE will be used again. Both BOE and Ultra Etch have the same components (Ammonium fluoride & Hydrofluoric acid) and vapor pressure (BOE = 0.4 psia or 21.05 mm Hg; Ultra Etch = 21.05 mm Hg). Therefore, the emissions from the etchants are the same, and they can be used interchangeably without change in emissions.

Chemical	(in Ultra Etch LFE 600 NP, or BOE etchant)	HF
Molecular weight:		20.01 lb/lbmole
Operating temperature:	28 C	82 F
Vapor pressure: (Vapor pressure of Ultra Etch LFE 600 NP)		21.05 mm Hg
	21.05 mm Hg/(760 mm Hg/14.7 psia) =	0.40715 psia
Surface area:	(0 ft+9.5 in/12 in/ft)*(1 ft+4.5 in/12 in/ft) =	1.09 ft ²

Computations:
 Gas-phase mass transfer coefficient K:
 $0.00438 * 2.493 \text{ ft/sec}^{0.78} * (18/20.01 \text{ lb/lbmole})^{(1/3)} = 0.00862 \text{ ft/sec}$

PM/HF:

Emission rates:

lb/sec (Uncontrolled)

$$20.01 \text{ lb/lbmole} * 0.0086 \text{ ft/sec} * 1.09 \text{ ft}^2 * 0.40715 \text{ psia} / (10.73 \text{ psia} * \text{ft}^3/\text{oR} * \text{lbmole} * (82+460)) = 0.0000131 \text{ lb/sec}$$

lb/hr

Uncontr. $0.0000131 \text{ lb/sec} * 3600 \text{ sec/hr} = 0.0473 \text{ lb/hr}$

Controlled: $0.0473 \text{ lb/hr} * (1-0.95) = 0.00237 \text{ lb/hr}$

lb/day

Uncontr. $0.0473 \text{ lb/hr} * 24 \text{ hrs/day} = 1.14 \text{ lb/day}$

Controlled: $0.00237 \text{ lb/hr} * 24 \text{ hrs/day} = 0.0568 \text{ lb/day}$

lb/yr

$0.0568 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 20.67 \text{ lb/yr}$

PM10:

lb/hr

Uncontr. $0.0473 \text{ lb/hr} * 0.96 = 0.0454 \text{ lb/hr}$

Controlled: $0.00237 \text{ lb/hr} * 0.96 = 0.00227 \text{ lb/hr}$

lb/day

Uncontr. $1.14 \text{ lb/day} * 0.96 = 1.090 \text{ lb/day}$

Controlled: $0.0568 \text{ lb/day} * 0.96 = 0.055 \text{ lb/day}$

lb/yr

$0.0545 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 19.85 \text{ lb/yr}$

Tank 4:

Dimensions:		ft	inches
W	22	0	9.5
L	22	1	4.5
H	22	0	11.5

Chemical		H ₂ SO ₄	5.60%
Molecular weight:		36.46	lb/lbmole
Operating temperature:	130 C	266	F

Vapor pressure: (Vapor pressure of 89.25% H₂SO₄ at 241.5 C is used) 5.3 mm Hg

$$5.30 \text{ mm Hg} / (760 \text{ mm Hg} / 14.7 \text{ psia}) = 0.103 \text{ psia}$$

Surface area: $(0 \text{ ft} + 9.5 \text{ in} / 12 \text{ in/ft}) * (1 \text{ ft} + 4.5 \text{ in} / 12 \text{ in/ft}) = 1.09 \text{ ft}^2$

Computations:

Gas-phase mass transfer coefficient K:

$$0.00438 * 2.493 \text{ ft/sec}^{0.78} * (18 / 36.46 \text{ lb/lbmole})^{(1/3)} = 0.0071 \text{ ft/sec}$$

PM/H₂SO₄:

Emission rates:

lb/sec (Uncontrolled)

$$36.46 \text{ lb/lbmole} * 0.0071 \text{ ft/sec} * 1.09 \text{ ft}^2 * 0.103 \text{ psia} / (10.73 \text{ psia} * \text{ft}^3 / \text{oR} * \text{lbmole} * (266 + 460)) = 0.000004 \text{ lb/sec}$$

lb/hr

$$\text{Uncontr.} \quad 0.000004 \text{ lb/sec} * 3600 \text{ sec/hr} = 0.01327 \text{ lb/hr}$$

$$\text{Controlled:} \quad 0.01327 \text{ lb/hr} * (1 - 0.95) = 0.00066 \text{ lb/hr}$$

lb/day

$$\text{Uncontr.} \quad 0.01327 \text{ lb/hr} * 24 \text{ hrs/day} = 0.319 \text{ lb/day}$$

$$\text{Controlled:} \quad 0.000664 \text{ lb/hr} * 24 \text{ hrs/day} = 0.01593 \text{ lb/day}$$

lb/yr

$$0.01593 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 5.80 \text{ lb/yr}$$

PM10:

lb/hr

$$\text{Uncontr.} \quad 0.01327 \text{ lb/hr} * 0.96 = 0.01274 \text{ lb/hr}$$

$$\text{Controlled:} \quad 0.000664 \text{ lb/hr} * 0.96 = 0.0006 \text{ lb/hr}$$

lb/day

$$\text{Uncontr.} \quad 0.319 \text{ lb/day} * 0.96 = 0.306 \text{ lb/day}$$

$$\text{Controlled:} \quad 0.01593 \text{ lb/day} * 0.96 = 0.01529 \text{ lb/day}$$

lb/yr

$$0.01529 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 5.57 \text{ lb/yr}$$

Total particulate emissions:

PM:

lb/hr

$$\text{Uncontr.} \quad (0.0473 + 0.01327) \text{ lb/hr} = 0.0606 \text{ lb/hr}$$

$$\text{Controlled:} \quad (0.00237 + 0.000664) \text{ lb/hr} = 0.00303 \text{ lb/hr}$$

lb/day

$$\text{Uncontr.} \quad (1.1359 + 0.3186) \text{ lb/day} = 1.4545 \text{ lb/day}$$

$$\text{Controlled:} \quad (0.0568 + 0.01593) \text{ lb/day} = 0.0727 \text{ lb/day}$$

PM10:

lb/hr

$$\text{Uncontr.} \quad (0.0454 + 0.01274) \text{ lb/hr} = 0.0582 \text{ lb/hr}$$

$$\text{Controlled:} \quad (0.00227 + 0.000637) \text{ lb/hr} = 0.00291 \text{ lb/hr}$$

lb/day

$$\text{Uncontr.} \quad (1.090 + 0.3058) \text{ lb/day} = 1.3963 \text{ lb/day}$$

$$\text{Controlled:} \quad (0.0545 + 0.01529) \text{ lb/day} = 0.0698 \text{ lb/day}$$

lb/yr

$$(19.85 + 5.57) \text{ lb/yr} = 25.4 \text{ lb/yr}$$

Tank 6:

IPA used: (Applicant's data)

10.0 gals/month

IPA Sp. Gr.

0.78505

Density of water @ 77 F

8.32 lb/gal

VOC:

lb/month $10 \text{ gals/month} * 0.78505 * 8.32 \text{ lb/gal} = 65.30 \text{ lb/month}$

lb/hr

Uncontr. $65.30 \text{ lb/month} / 30 \text{ days/month} / 24 \text{ hrs/day} = 0.09 \text{ lb/hr}$

Controlled: $0.09 \text{ lb/hr} * (1-0) = 0.091 \text{ lb/hr}$

lb/day

Uncontr. $0.09 \text{ lb/hr} * 24 \text{ hrs/day} = 2.18 \text{ lb/day}$

Controlled: $0.0907 \text{ lb/hr} * 24 \text{ hrs/day} = 2.18 \text{ lb/day}$

lb/yr

$2.18 \text{ lb/day} * 7 \text{ days/wk} * 52 \text{ wks/yr} = 792.32 \text{ lb/yr}$

Summary:

		PM	PM10	VOC	HF	H ₂ SO ₄	IPA
lb/hr	Uncontr.	0.0606	0.06	0.09	0.0473	0.01	0.09
	Contr.	0.00303	0.0029	0.091	0.00237	0.0007	0.091
lb/day	Uncontr.	1.454	1.396	2.18	1.14	0.319	2.18
	Contr.	0.07	0.07	2.18	0.0568	0.016	2.18
lb/yr			25.41	792.32	20.67	5.80	792.32

IPA limit:

10 gals/month

TIER 1 SCREENING RISK ASSESSMENT REPORT

Receptor Distance (actual)	50
Receptor Distance (for X/Q LOOKUP)	50

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
6.82E-02	3.39E-02
PASSED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index	Acute Pollutant Screening Index (PSI)
Fluorides and fluoride compounds*	2.07E+01	2.37E-03				
Sulfuric acid (and oleum)	5.80E+00	6.64E-04	8.67E+01	1.20E-01	6.69E-02	5.53E-03
Isopropyl alcohol	7.92E+02	9.07E-02	6.07E+05	3.20E+00	1.31E-03	2.84E-02
TOTAL (APPLICATION SCREENING INDEX)					6.82E-02	3.39E-02

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

Facility Equipment and Requirements (Section D)

This section consists of a table listing all permitted equipment at the facility, facility wide requirements, all individual Permits to Construct and Permits to Operate issued to various equipment at the facility, and Rule 219-exempt equipment subject to source-specific requirements. Each permit and Rule 219-exempt equipment will list operating conditions including periodic monitoring requirements, and applicable emission limits and requirements that the equipment is subject to. Also included is the rule origin and authority of each emission limit and permit condition.

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMITTED EQUIPMENT LIST

THE FOLLOWING IS A LIST OF ALL PERMITS TO CONSTRUCT AND PERMITS TO OPERATE AT THIS FACILITY:

Application number	Permit to Operate number	Equipment description
134696	M56103	STORAGE TANK MISC INORGANIC ACID
134697	M56104	STORAGE TANK MISC MATERIALS
134698	M56105	STORAGE TANK MISC INORGANIC ACID
134699	M56106	STORAGE TANK MISC INORGANIC ACID
134701	M56108	I C E (>500 HP) EM ELEC GEN DIESEL
134709	M56109	STORAGE TANK MISC MATERIALS
134710	M56110	STORAGE TANK MISC INORGANIC ACID
262744	D89083	ACTIVATED CARBON ADSORBER OTHER
293299	D84484	STORAGE TANK MISC ORGANIC ACID
302031	D90395	STORAGE TANK OTHER W/CTL HYDROGEN FLUORI
302032	F52982	SEMICONDUCTOR, SOLVENT CLEANING (<5 PCS)
381811	F54712	STORAGE TANK ORGANIC CHEMICALS MISC
381813	F54714	TANK, SURFACE PREPARATION – OTHER ACIDS
383504	F54708	TANK, SURFACE PREPARATION – OTHER ACIDS
410529	F58209	I C E (50-500 HP) EM FIRE FGHT – DIESEL
432426	F91809	STORAGE TANK MISC INORGANIC ACID
441482	F93346	BOILER (5-20 MMBTU/HR) NAT GAS ONLY C/G
442573	F93347	BOILER (5-20 MMBTU/HR) NAT GAS ONLY C/G
459172	G1986	ACTIVATED CARBON ADSORBER DRUM VENT M.S.
460709	G1988	STORAGE TANK MISC INORGANIC ACID
460711	G1989	STORAGE TANK MISC INORGANIC ACID
460712	G1990	STORAGE TANK MISC INORGANIC ACID
460715	G1993	STORAGE TANK MISC MATERIALS
460732	G1997	STORAGE TANK MISC INORGANIC ACID
460733	G1998	STORAGE TANK MISC INORGANIC ACID
460735	G2000	STORAGE TANK MISC INORGANIC ACID
460744	G2001	STORAGE TANK MISC INORGANIC ACID
491984	G4083	STORAGE TANK MISC INORGANIC ACID
498032	G4072	WAFER ETCHING AND STRIPPING LINE
498033	G4073	WAFER ETCHING AND STRIPPING LINE
498040	G4080	STORAGE TANK MISC INORGANIC ACID
498041	G4081	STORAGE TANK MISC INORGANIC ACID
498042	G8252	STORAGE TANK MISC INORGANIC ACID

**FACILITY PERMIT TO OPERATE
 INTERNATIONAL RECTIFIER HEXFET AMERICA**

503219	G8262	STORAGE TANK ORGANIC CHEMICALS MISC
503223	G8265	WAFER ETCHING AND STRIPPING LINE
503224	G8266	STORAGE TANK MISC INORGANIC ACID
510419	G9347	WET CHEMICAL AND SOLVENT CLEANING
510420	G9348	WET CHEMICAL AND SOLVENT CLEANING
511730		SEMICONDUCTOR, INTEGRATED CIRCUIT>=5 PC
511731		SEMICONDUCTOR, INTEGRATED CIRCUIT>=5 PC
511732		SCRUBBER CHEMICAL M.S.
511733		SCRUBBER CHEMICAL M.S.
511735		SEMICONDUCTOR, PHOTORESIST (>=5 PIECES)
511736		SEMICONDUCTOR, PHOTORESIST (>=5 PIECES)
511737		AFTERBURNER, DIRECT FLAME
511738		AFTERBURNER, DIRECT FLAME
511739		STORAGE TANK MISC INORGANIC ACID
511641		STORAGE TANK MISC INORGANIC ACID
511742		STORAGE TANK MISC INORGANIC ACID
511744		STORAGE TANK MISC INORGANIC ACID
511745		STORAGE TANK MISC INORGANIC ACID
511746		WAFER ETCHING AND STRIPPING LINE

NOTE: EQUIPMENT LISTED ABOVE THAT HAVE NO CORRESPONDING PERMITS TO OPERATE NUMBER ARE ISSUED PERMITS TO CONSTRUCT. THE ISSUANCE OR DENIAL OF THEIR PERMITS TO OPERATE IS SUBJECT TO ENGINEERING FINAL REVIEW. ANY OTHER APPLICATIONS THAT ARE STILL BEING PROCESSED AND HAVE NOT BEEN ISSUED PERMITS TO CONSTRUCT OR PERMITS TO OPERATE WILL NOT BE FOUND IN THIS TITLE V PERMIT.

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

FACILITY WIDE CONDITION(S)

Condition(s):

1. EXCEPT FOR OPEN ABRASIVE BLASTING OPERATIONS, THE OPERATOR SHALL NOT DISCHARGE INTO THE ATMOSPHERE FROM ANY SINGLE SOURCE OF EMISSIONS WHATSOEVER ANY AIR CONTAMINANT FOR A PERIOD OR PERIODS AGGREGATING MORE THAN THREE MINUTES IN ANY ONE HOUR WHICH IS:
 - A. AS DARK OR DARKER IN SHADE AS THAT DESIGNATED NO. 1 ON THE RINGELMANN CHART, AS PUBLISHED BY THE UNITED STATES BUREAU OF MINES; OR
 - B. OF SUCH OPACITY AS TO OBSCURE AN OBSERVER'S VIEW TO A DEGREE EQUAL TO OR GREATER THAN DOES SMOKE DESCRIBED IN SUBPARAGRAPH (A) OF THIS CONDITION.
[RULE 401]
2. THE TOTAL QUANTITY OF VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS FROM THIS FACILITY SHALL NOT EXCEED 1830 POUNDS IN ANY CALENDAR MONTH. TO ENSURE COMPLIANCE WITH THE EMISSION LIMIT OF THIS CONDITION, THE OPERATOR SHALL:
 - A. IN ADDITION TO THE RECORDKEEPING REQUIREMENTS IN RULE 109, KEEP ADEQUATE RECORDS FOR ALL EQUIPMENT AND OPERATIONS AT THIS FACILITY TO VERIFY THE DAILY VOC EMISSIONS IN POUNDS AND THE VOC CONTENT OF EACH MATERIAL AS APPLIED (INCLUDING WATER AND EXEMPT COMPOUNDS).
 - B. WITHIN 14 CALENDAR DAYS AFTER THE END OF EACH MONTH, TOTAL AND RECORD VOC EMISSIONS FOR THE MONTH FROM ALL EQUIPMENT AND OPERATIONS THAT ARE REQUIRED TO HAVE WRITTEN PERMITS OR ARE EXEMPT FROM WRITTEN PERMITS PURSUANT TO RULE 219. THE RECORD SHALL INCLUDE ANY PROCEDURES USED TO ACCOUNT FOR CONTROL DEVICE EFFICIENCIES AND/OR WASTE DISPOSAL. IT SHALL BE SIGNED AND CERTIFIED FOR ACCURACY BY THE HIGHEST RANKING INDIVIDUAL RESPONSIBLE FOR COMPLIANCE WITH DISTRICT RULES.
 - C. MAINTAIN A SINGLE LIST WHICH INCLUDES ONLY THE NAME AND ADDRESS OF EACH PERSON FROM WHOM THE FACILITY ACQUIRED VOC-CONTAINING MATERIALS REGULATED BY THE DISTRICT THAT WERE USED OR STORED AT THE FACILITY DURING THE PRECEDING 12 MONTHS.
 - D. RETAIN ALL PURCHASE INVOICES FOR ALL VOC-CONTAINING MATERIAL USED OR STORED AT THE FACILITY, AND ALL WASTE MANIFESTS FOR ALL WASTE VOC-CONTAINING MATERIAL REMOVED FROM THE FACILITY.
[RULE 1303 (b) (2)-OFFSETS]
3. ALL RECORDS REQUIRED BY THIS PERMIT SHALL BE PREPARED IN A FORMAT WHICH IS ACCEPTABLE TO THE DISTRICT, SHALL BE RETAINED AT THE FACILITY FOR AT LEAST FIVE YEARS, AND SHALL BE MADE AVAILABLE TO ANY DISTRICT REPRESENTATIVE UPON REQUEST.
[RULE 1303 (b) (2)-OFFSETS]

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

PERMIT TO OPERATE

**Permit No. M56103
A/N 134696**

Equipment Description:

STORAGE TANK T-175, HYDROGEN FLUORIDE, 4' -6" DIA. x 7' -3" H. 500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

**Permit No. M56104
A/N 134697**

Equipment Description:

STORAGE TANK T-185, BUFFERED OXIDE ETCH, 4' -6" DIA. x 7' -3" H. 500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. M56105
A/N 134698

Equipment Description:

STORAGE TANK T-12, WASTE ACID, 10' -0" DIA. x 11' -6" L., 5728 GALLON CAPACITY, WITH TWO TRANSFER PUMPS EACH 10 H.P.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. M56106
A/N 134699

Equipment Description:

STORAGE TANK T-13, WASTE ACID, 10' -0" DIA. x 11'-6" L., 5728 GALLON CAPACITY, WITH TWO TRANSFER PUMPS, EACH 10 H.P.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. M56108
A/N 134701

Equipment Description:

INTERNAL COMBUSTION ENGINE, DIESEL FIRED, MITSUBISHI, MODEL S12N-PTA-2, 1450 H.P. DRIVING A 1000 K.W. EMERGENCY ELECTRIC GENERATOR.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. DIESEL FUEL SUPPLIED TO THIS ENGINE SHALL HAVE A SULFUR CONTENT OF LESS THAN 0.05% BY WEIGHT.
[RULE 431.2]
4. AN OPERATIONAL NON-RESETTABLE TOTALIZING TIME METER SHALL BE MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
[RULE 1304 (a) (4)]
5. THE OPERATING TIME OF THIS ENGINE SHALL NOT EXCEED 199 HOURS IN ANY ONE YEAR.
[RULE 1304 (a) (4)]
6. AN ENGINE OPERATING LOG LISTING THE DATE OF OPERATION, THE ELAPSED TIME, IN HOURS, AND THE REASON FOR OPERATION SHALL BE KEPT AND MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Emissions And Requirements:

7. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:
PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

PERMIT TO OPERATE

**Permit No. M56109
A/N 134709**

Equipment Description:

MIX TANK 181, BUFFERED OXIDE ETCH, 4' - 6" DIA. X 6' -11" H. 500 GALLON CAPACITY, WITH A 1/2 H.P. MIXER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. M56110
A/N 134710

Equipment Description:

MIX TANK 171, HYDROGEN FLUORIDE, 4' -6" DIA. X 6'-10" H. 500 GALLON CAPACITY WITH A 1/2 H.P. MIXER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. D89083
A/N 262744

Equipment Description:

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. CARBON ADSORBER, CAMERON-YAKIMA, MODEL TSU 2000, CANISTER TYPE, WITH TWO PARALLEL CANISTERS, EACH WITH 2000 LBS. OF CARBON AND A 4' - 9" BED DEPTH.
2. EXHAUST SYSTEM WITH A 15 HP FAN VENTING TWO WET BENCHES.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. A GUAGE SHALL BE INSTALLED AND MAINTAINED TO INDICATE, IN INCHES OF WATER COLUMN, THE STATIC PRESSURE DIFFERENTIAL ACROSS EACH CARBON BED. WHEN IN OPERATION, THIS PRESSURE DIFFERENTIAL SHALL NOT EXCEED 18 INCHES OF WATER.
[RULE 1303 (b) (2)-OFFSETS]
4. THIS EQUIPMENT SHALL BE OPERATED WITH ONLY ONE CARBON CANISTER IN SERVICE AT ANY ONE TIME.
[RULE 204]
5. THE HYDROCARBON (VOC) CONCENTRATION IN THE EXHAUST GAS FROM THE CARBON ADSORBER SHALL BE TESTED, BY A GAS DETECTION TUBE MEASUREMENT (DRAGER OR EQUIVALENT) OR OTHER METHOD WITH PRIOR DISTRICT APPROVAL, DAILY FOR THE FIRST 15 DAYS SINCE CARBON REPLACEMENT AND EVERY TWELVE HOURS OF OPERATION THEREAFTER. IF THE RESULTS OF THIS TEST SHOW A VOC CONCENTRATION EXCEEDING 10.0 PPMV (SUBJECT TO REVISION), THE EXHAUST FLOW SHALL BE SHIFTED TO A FRESH CARBON CANISTER IMMEDIATELY.
[RULE 3004 (a) (4)]
6. THIS EQUIPMENT SHALL OPERATE WITH AN OVERALL VOC CONTROL EFFICIENCY (COLLECTION AND DESTRUCTION) EXCEEDING 95.0% BY WEIGHT.
[RULE 1303 (b) (2)-OFFSETS]
7. RECORDS OF DATES OF CARBON REPLACEMENT, AND DAILY HYDROCARBON MEASUREMENTS SHALL BE MAINTAINED AND RETAINED ON FILE FOR FIVE YEARS. THESE RECORDS SHALL BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. D84484
A/N 293299

Equipment Description:

STORAGE TANK T-145, PAD ETCH ACID, 3'-0"DIA. x 6'-5"H., 300 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS TANK SHALL NOT BE USED FOR STORING ORGANIC LIQUID HAVING AN ORGANIC COMPOSITE VAPOR PRESSURE OF 25 mm Hg (0.5 psia) OR GREATER UNDER ACTUAL STORAGE CONDITIONS.
[RULE 1303 (b) (2)-OFFSETS]
4. THROUGHPUT TO THIS TANK SHALL NOT EXCEED 300 GALLONS PER DAY. THROUGHPUT RECORDS SHALL BE MAINTAINED AND RETAINED ON FILE FOR A FIVE YEAR PERIOD, AND SHALL BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]
5. THIS TANK SHALL NOT BE USED TO STORE ANY COMPOUND CONTAINING A CARCINOGENIC SUBSTANCE AS SPECIFIED IN TABLE I OF RULE 1401.
[RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

**Permit No. D90395
A/N 302031**

Equipment Description:

STORAGE TANK, HYDROFLUORIC ACID, 5000 GALLON CAPACITY, 7'-0"DIA. X 20'-6"L.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS TANK SHALL NOT BE USED FOR STORING HYDROFLUORIC ACID HAVING A CONCENTRATION EXCEEDING 50 PERCENT, BY WEIGHT.
[RULE 1303 (b) (2)-OFFSETS]
4. THIS EQUIPMENT SHALL NOT STORE LIQUID UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT OR A PERMIT TO CONSTRUCT BY THE DISTRICT.
[RULE 1303 (b) (2)-OFFSETS]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F52982
A/N 302032

Equipment Description:

SOLVENT BENCH, SEMIFAB, MODEL WPS600, 3'-0"W. X 8'-0"L. X 5'- 7"H., 1.8 KVA.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE TOTAL AMOUNT OF VOLATILE ORGANIC COMPOUND (VOC) EMISSION FROM THIS FACILITY SHALL NOT EXCEED 1,830 POUNDS IN ANY ONE CALENDAR MONTH. THE AMOUNT OF VOC EMISSION FROM THIS EQUIPMENT SHALL BE THE TOTAL AMOUNT OF SOLVENT USED IN THIS EQUIPMENT, EXCLUDING SALVAGE SOLVENT, DISCOUNTED BY THE NON-VOLATILE PORTION OF THE SOLVENT, AND THEN DISCOUNTED BY 98.7% (THE CONTROL EFFICIENCY OF THE CONTROL SYSTEM VENTING THIS EQUIPMENT).
[RULE 1303 (b) (2)-OFFSETS]
5. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F54712
A/N 381811

Equipment Description:

STORAGE TANK, WASTE SOLVENT, 8'-0" W. X 15'-6" L. X 7'-0" H., 5000 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF WASTE SOLVENT TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 5000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F54714
A/N 381813

Equipment Description:

MIX TANK T-161, MIXED ACID ETCH, 4'-6" DIA. X 5'-6" H., 500 GALLON CAPACITY, WITH A 1/2-HP MIXER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 917 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F54708
A/N 383504

Equipment Description:

HOLD TANK T-165, MIXED ACID ETCH, 4'-6" DIA. X 5'-6" H., 500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 917 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F58209
A/N 410529

Equipment Description:

INTERNAL COMBUSTION ENGINE, CLARK MODEL JW6H-UF30 (JOHN DEERE JDFD-06WA)
TURBOCHARGED/AFTERCOOLED, 6 CYLINDERS, 265 HP, DIESEL-FUELED, WITH A 300 GALLON DIESEL
FUEL TANK, DRIVING AN EMERGENCY FIRE PUMP.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL OPERATE IN COMPLIANCE WITH RULE 431.2.
[RULE 431.2]
4. THE FUEL INJECTION TIMING OF THIS ENGINE SHALL BE SET AND MAINTAINED AT 9 DEGREES RETARDED RELATIVE TO STANDARD TIMING.
[RULE 1303 (a) (1)-BACT]
5. THE OPERATING TIME OF THIS ENGINE SHALL NOT EXCEED 199 HOURS IN ANY ONE CALENDAR YEAR.
[RULE 1304 (a) (4)]
6. AN OPERATIONAL NON-RESETTABLE TOTALIZING TIME METER SHALL BE MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
[RULE 1304 (a) (4)]
7. THIS ENGINE SHALL BE OPERATED ONLY DURING EMERGENCIES OR FOR MAINTENANCE AND TESTING PURPOSES.
[RULE 1304 (a) (4)]
8. AN ENGINE OPERATING LOG LISTING THE DATE OF OPERATION, THE ELAPSED TIME IN HOURS, AND THE REASON FOR OPERATION SHALL BE KEPT AND MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F91809
A/N 432426

Equipment Description:

WASTE ACID NEUTRALIZATION LINE CONSISTING OF:

1. TANK NO. T-16, ACID NEUTRALIZATION, 10' - 0"DIA. x 11' - 6"H., 5,728 GALLON CAPACITY, WITH ONE 3-HP MIXER.
2. TANK NO. T-17, ACID NEUTRALIZATION/EQUALIZATION, 10' - 0"DIA. x 11' - 6"H., 5,728 GALLON CAPACITY, WITH ONE 3-HP MIXER.
3. TANK NO. T-301, ACID NEUTRALIZATION, 7' - 0"DIA. x 9' - 0"H., 2,600 GALLON CAPACITY, WITH ONE 3-HP MIXER.
4. TANK NO. T-302, ACID NEUTRALIZATION, 7' - 0"DIA. x 9' - 0"H., 2,600 GALLON CAPACITY, WITH ONE 3-HP MIXER.
5. TANK NO. T-303, ACID NEUTRALIZATION/STORAGE, 6' - 6"DIA. x 9' - 0"H., 2,200 GALLON CAPACITY, WITH TWO 10-HP TRANSFER PUMPS, ONE A STANDBY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO CONSTRUCT/OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. A NON-RESETTABLE FLOW METER SHALL BE INSTALLED TO INDICATE THE AMOUNT OF WASTE WATER, IN GALLONS, PUMPED OUT OF THIS EQUIPMENT.
[RULE 1303 (b) (2)-OFFSETS]
5. THE AMOUNT OF WASTE WATER PUMPED OUT OF THIS EQUIPMENT SHALL NOT EXCEED 4,000,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 5. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F93346
A/N 441482

Equipment Description:

BOILER NO. 2, STONE-JOHNSTON, FIRE TUBE TYPE, MODEL PFTA 300 4LG 30W, 13,230,000 BTU PER HOUR, NATURAL GAS- FIRED, WITH ONE INDUSTRIAL COMBUSTION, MODEL NTD126NGX-09S-5P, BURNER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES
[RULE 204]
3. THE NOX AND CO CONCENTRATIONS, IN PARTS PER MILLION BY VOLUME (PPMV), ON A DRY BASIS CORRECTED TO 3% OXYGEN, SHALL NOT EXCEED THE FOLLOWING:

<u>POLLUTANTS</u>	<u>PPMV</u>
NOX	12
CO	50

[RULE 1303 (a) (1)-BACT]
4. THE BOILER SHALL BE EQUIPPED WITH A CONTROL SYSTEM TO AUTOMATICALLY REGULATE COMBUSTION AIR AND FUEL AS THE BOILER LOAD VARIES. THIS AUTOMATIC CONTROL SYSTEM SHALL BE ADJUSTED AND TUNED AT LEAST ONCE EVERY SIX MONTHS ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS TO MAINTAIN ITS ABILITY TO REPEAT THE SAME PERFORMANCE AT THE SAME FIRING RANGE. NOX, O2, AND CO SHALL BE MEASURED AND RECORDED ALONG WITH THE TUNE-UP PROCEDURES.
[RULE 1303 (a) (1)-BACT]
5. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 3 AND 4. THE RECORDS SHALL BE KEPT FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Periodic Monitoring:

6. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE CO EMISSION LIMIT(S) EITHER BY:
(a) CONDUCTING A SOURCE TEST AT LEAST ONCE EVERY FIVE YEARS USING AQMD METHOD 100.1 OR 10.1; OR (b) CONDUCTING A TEST AT LEAST ANNUALLY USING A PORTABLE

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

ANALYZER AND AQMD-APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS TO DEMONSTRATE COMPLIANCE WITH RULE 1146 CONCENTRATION LIMIT. THE OPERATOR SHALL COMPLY WITH ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.

[RULE 3004 (a) (4)]

7. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE NOX EMISSION LIMIT(S) EITHER BY: (a) CONDUCTING A SOURCE TEST AT LEAST ONCE EVERY FIVE YEARS USING AQMD METHOD 100.1 OR 7.1; OR (b) CONDUCTING A TEST AT LEAST ANNUALLY USING A PORTABLE ANALYZER AND AQMD-APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS TO DEMONSTRATE COMPLIANCE WITH RULE 1146 CONCENTRATION LIMIT. THE OPERATOR SHALL COMPLY WITH ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.

[RULE 3004 (a) (4)]

Emissions And Requirements:

8. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

PM: 0.1 GR/SCF, RULE 409
CO: 2000 PPMV, RULE 407
CO: 400 PPMV, RULE 1146
NOX: 30 PPMV, RULE 1146

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. F93347
A/N 442573

Equipment Description:

BOILER NO. 1, STONE-JOHNSTON, FIRE TUBE TYPE, MODEL PFTA 300 4LG 30W, 13,230,000 BTU PER HOUR, NATURAL GAS- FIRED, WITH ONE INDUSTRIAL COMBUSTION, MODEL NTD126NGX-09S-5P, BURNER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

[RULE 204]

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES

[RULE 204]

3. THE NOX AND CO CONCENTRATIONS, IN PARTS PER MILLION BY VOLUME (PPMV), ON A DRY BASIS CORRECTED TO 3% OXYGEN, SHALL NOT EXCEED THE FOLLOWING:

<u>POLLUTANTS</u>	<u>PPMV</u>
NOX	12
CO	50

[RULE 1303 (a) (1)-BACT]

4. THE BOILER SHALL BE EQUIPPED WITH A CONTROL SYSTEM TO AUTOMATICALLY REGULATE COMBUSTION AIR AND FUEL AS THE BOILER LOAD VARIES. THIS AUTOMATIC CONTROL SYSTEM SHALL BE ADJUSTED AND TUNED AT LEAST ONCE EVERY SIX MONTHS ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS TO MAINTAIN ITS ABILITY TO REPEAT THE SAME PERFORMANCE AT THE SAME FIRING RANGE. NOX, O₂, AND CO SHALL BE MEASURED AND RECORDED ALONG WITH THE TUNE-UP PROCEDURES.

[RULE 1303 (a) (1)-BACT]

5. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 3 AND 4. THE RECORDS SHALL BE KEPT FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 3004 (a) (4)]

Periodic Monitoring:

6. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE CO EMISSION LIMIT(S) EITHER BY:
(a) CONDUCTING A SOURCE TEST AT LEAST ONCE EVERY FIVE YEARS USING AQMD METHOD 100.1 OR 10.1; OR (b) CONDUCTING A TEST AT LEAST ANNUALLY USING A PORTABLE

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

ANALYZER AND AQMD-APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS TO DEMONSTRATE COMPLIANCE WITH RULE 1146 CONCENTRATION LIMIT. THE OPERATOR SHALL COMPLY WITH ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.

[RULE 3004 (a) (4)]

7. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE NOX EMISSION LIMIT(S) EITHER BY: (a) CONDUCTING A SOURCE TEST AT LEAST ONCE EVERY FIVE YEARS USING AQMD METHOD 100.1 OR 7.1; OR (b) CONDUCTING A TEST AT LEAST ANNUALLY USING A PORTABLE ANALYZER AND AQMD-APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS TO DEMONSTRATE COMPLIANCE WITH RULE 1146 CONCENTRATION LIMIT. THE OPERATOR SHALL COMPLY WITH ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.

[RULE 3004 (a) (4)]

Emissions And Requirements:

8. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

PM: 0.1 GR/SCF, RULE 409
CO: 2000 PPMV, RULE 407
CO: 400 PPMV, RULE 1146
NOX: 30 PPMV, RULE 1146

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G1986
A/N 459172

Equipment Description:

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. ADSORBER, CAMERON-YAKIMA MODEL RADIAL 1600, CANISTER TYPE, CONSISTING OF THREE PARALLEL TRAINS (ONE STANDBY), EACH TRAIN WITH THREE CANISTERS IN SERIES, EACH CANISTER WITH 1,430 POUNDS OF ACTIVATED CARBON.
2. EXHAUST SYSTEM WITH ONE 50-HP BLOWER VENTING TWENTY-TWO PHOTOLITHOGRAPHIC TRACKS, TWO SOLVENT BENCHES, AND ONE WASTE SOLVENT STORAGE TANK.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. VOC CONCENTRATIONS AT THE OUTLETS OF THE SECONDARY ADSORBERS SHALL BE MEASURED, BY A DISTRICT APPROVED ANALYZER, AND RECORDED AT LEAST ONCE IN ANY OPERATING DAY.
[1303 (a) (1)-BACT, RULE 1303 (b) (2)-OFFSETS, RULE 3004 (a) (4)]
4. WHENEVER THE VOC CONCENTRATION AT THE OUTLET OF THE SECONDARY ADSORBER OF THE OPERATING TRAIN IS GREATER THAN 10 PPMV AS METHANE, THAT TRAIN SHALL BE SHUT DOWN IMMEDIATELY AND ADSORBENT IN ALL THREE ADSORBERS IN THAT TRAIN SHALL BE REPLACED WITH FRESH ADSORBENT BEFORE IT IS PLACED INTO SERVICE AGAIN.
[1303 (a) (1)-BACT, RULE 1303 (b) (2)-OFFSETS]
5. RECORDS SHALL BE KEPT TO PROVE COMPLIANCE WITH CONDITION NOS. 3 AND 4. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 1303 (a) (1)-BACT, RULE 1303 (b) (2)-OFFSETS]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G1988
A/N 460709

Equipment Description:

STORAGE TANK T-408, SCALE INHIBITOR, 2' - 0"DIA. x 2' - 6"H., 50 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 150 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROGEN CHLORIDE, SULFURIC ACID AND PHOSPHORIC ACID SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 3 AND 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G1989
A/N 460711

Equipment Description:

STORAGE TANK T-511, WASTE ACIDS, 1' - 8"W. x 3' - 0.5"L. x 1' - 8"H., 50 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THE MAXIMUM AMOUNT OF WASTE ACIDS TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 45,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROGEN CHLORIDE, NITRIC ACID, PHOPHORIC ACID, SULFURIC ACID AND HYDROGEN FLUORIDE, SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 3 AND 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G1990
A/N 460712

Equipment Description:

STORAGE TANK T-501, WASTE SULFURIC ACID, 4' - 3"W. x 7' - 8"L. x 2' - 0"H., 375 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF WASTE SULFURIC ACID TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 670,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

**Permit No. G1993
A/N 460715**

Equipment Description:

STORAGE TANK T-504, WASTE AMMONIUM HYDROXIDE, 4' - 2"W. x 7' - 4.5"L. x 1' - 10"H., 375 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF WASTE AMMONIUM HYDROXIDE TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 120,450 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G1997
A/N 460732

Equipment Description:

MIXING TANK T-191, ALUMINUM ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY, WITH ONE 0.43 HP MIXER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 6,244 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT NITRIC ACID AND PHOSPHORIC ACID, SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

**Permit No. G1998
A/N 460733**

Equipment Description:

HOLDING TANK T-195, ALUMINUM ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 6,244 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT NITRIC ACID, AMMONIA AND PHOSPHORIC ACID SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

PERMIT TO OPERATE

**Permit No. G2000
A/N 460735**

Equipment Description:

HOLDING TANK T-405, WASTE SULFURIC ACID, 2' - 6"DIA. x 4' - 0"H., 140 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT RECEIVE MORE THAN 126,900 GALLONS OF WASTE SULFURIC ACID IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 3. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

**Permit No. G2001
A/N 460744**

Equipment Description:

HOLDING TANK T-406, WASTE SULFURIC ACID, 2' - 7"DIA. x 2' - 9"H., 100 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT RECEIVE MORE THAN 93,132 GALLONS OF WASTE SULFURIC ACID IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 3. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G4083
A/N 491984

Equipment Description:

STORAGE TANK T-506, WASTE WATER, 4' - 0"W. x 7' - 3"L. x 1' - 11"H., 375 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]
4. THIS EQUIPMENT SHALL NOT RECEIVE MORE THAN 1,839,600 GALLONS OF WASTE WATER IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS USED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY TOXIC AIR CONTAMINANTS IDENTIFIED IN RULE 1401, TABLE I, WITH AN EFFECTIVE DATE OF MARCH 7, 2008 OR EARLIER, EXCEPT FOR AMMONIA (CAS # 7664-41-7), SULFURIC ACID (CAS # 7664-93-9), HYDROCHLORIC ACID (CAS # 7647-01-0), NITRIC ACID (CAS # 7697-37-2), PHOSPHORIC ACID (CAS # 7664-38-2), AND HYDROFLUORIC ACID (CAS # 7664-39-3).
[RULE 1401]
6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No. G4072
A/N 498032

Equipment Description:

WAFER ETCHING AND STRIPPING LINE NO. 2, AKRION GAMA SERIES, CONSISTING OF:

1. TANK NO. 1, ETCHING/MILLING, AMMONIUM HYDROXIDE/HYDROGEN PEROXIDE, 0' - 10.82"W. x 1' - 4.38"L. x 0' - 7.15"H., WITH ONE 400-W MEGASONIC CLEANER, AND ONE 3-KW HEATER.
2. TANK NO. 3, HYDROGEN FLUORIDE, 0' - 11.38"W. x 1' - 4.38"L. x 0' - 11.2"H. (INSIDE DIMENSIONS), WITH ONE 8-KW HEATER.
3. TANK NO. 4, STRIPPING, HYDROGEN CHLORIDE, 0' - 9.5"W. x 1' - 4.37"L. x 0' - 11.13"H., UNHEATED.
4. TANK NO. 5, RINSING/DRYING, DEIONIZED WATER WITH ISOPROPYL ALCOHOL, 0' - 10"W. x 1' - 5"L. x 0' - 10"H., UNHEATED.
5. ASSOCIATED RINSE TANKS.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS TANKS 1, 3, 4, AND 5 ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT.
[RULE 1303 (a) (1)-BACT]
4. THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED IN THIS EQUIPMENT SHALL NOT EXCEED 10 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSIONS SHALL BE THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED IN THIS EQUIPMENT DISCOUNTED BY 98.7%.
[RULE 1303 (b) (2)-OFFSETS]

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 4 AND 5. THE RECORDS SHALL BE KEPT ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 1303 (b) (2)-OFFSETS, RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G4073
A/N 498033

Equipment Description:

WAFER ETCHING AND STRIPPING LINE NO. 1, AKRION GAMA SERIES, CONSISTING OF:

1. TANK NO. 1, ETCHING/MILLING, HYDROGEN FLUORIDE/AMMONIUM FLUORIDE, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 3-KW HEATER.
2. TANK NO. 4, STRIPPING, SULFURIC ACID/HYDROGEN PEROXIDE, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 8-KW HEATER.
3. TANK NO. 6, RINSING/DRYING, DEIONIZED WATER WITH ISOPROPYL ALCOHOL, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 3-KW HEATER.
4. ASSOCIATED RINSE TANKS.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS TANKS 1 AND 4 ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT.
[RULE 1303 (a) (1)-BACT]
4. THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED IN THIS EQUIPMENT SHALL NOT EXCEED 10 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSIONS SHALL BE THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED IN THIS EQUIPMENT.
[RULE 1303 (b) (2)-OFFSETS]
6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 4 AND 5. THE RECORDS SHALL BE KEPT ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 1303 (b) (2)-OFFSETS, RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No. G4080
A/N 498040

Equipment Description:

STORAGE TANK T-121, PRE-MIX PAE, 7' - 0"DIA. x 6' - 10"L., 2,000 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]
4. THIS EQUIPMENT SHALL NOT RECEIVE MORE THAN 1,000 GALLONS OF MIXED ACIDS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS USED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY TOXIC AIR CONTAMINANTS IDENTIFIED IN RULE 1401, TABLE I, WITH AN EFFECTIVE DATE OF MARCH 7, 2008 OR EARLIER, EXCEPT FOR NITRIC ACID (CAS # 7697-37-2) AND PHOSPHORIC ACID (CAS # 7664-38-2).
[RULE 1401]
6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 3. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G4081
A/N 498041

Equipment Description:

STORAGE TANK T-411, SCALE INHIBITOR, 1' - 3"DIA. x 1' - 10"H., 20 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT RECEIVE MORE THAN 50 GALLONS OF SCALE INHIBITOR IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. MATERIALS USED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY TOXIC AIR CONTAMINANTS IDENTIFIED IN RULE 1401, TABLE I, WITH AN EFFECTIVE DATE OF MARCH 7, 2008 OR EARLIER, EXCEPT FOR HYDROCHLORIC ACID (CAS # 7647-01-0), PHOSPHORIC ACID (CAS # 7664-38-2), AND SULFURIC ACID (CAS # 7664-93-9).
[RULE 1401]
5. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 3. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G8252
A/N 498042

Equipment Description:

STORAGE TANK T-525, MIXED ACIDS, 1' - 6"W. x 2' - 0"L. x 1' - 6"H., 30 GALLON CAPACITY, WITH ONE 0.33-HP PUMP.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]
4. THE MAXIMUM AMOUNT OF WASTE ACIDS TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 900 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROCHLORIC ACID (CAS # 7647-01-0), NITRIC ACID (CAS # 7697-37-2), SULFURIC ACID (CAS # 7664-93-9), HYDROFLUORIC ACID (CAS # 7664-39-3), PHOSPHORIC ACID (CAS # 7664-38-2), SODIUM HYDROXIDE (CAS # 1310732), COPPER AND COPPER COMPOUNDS (CAS # 7440508), CHROMIC TRIOXIDE [AS CHROMIC ACID] (CAS # 1333-82-0), AMMONIA (CAS # 7664-41-7), AND ETHYLENE GLYCOL (CAS # 107-21-1) SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

**Permit No. G8262
A/N 503219**

Equipment Description:

STORAGE TANK T-928, WASTE SOLVENTS, 7' - 8"DIA. x 14' - 6.5"L., 4,500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THE MAXIMUM AMOUNT OF WASTE SOLVENT TRANSFERRED THROUGH THIS TANK SHALL NOT EXCEED 3,900 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT CRESOL AND ISOPROPYL ALCOHOL (CAS # 67-63-0). SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
5. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 3 AND 4. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G8265
A/N 503223

Equipment Description:

STORAGE TANK T-502, WASTE ACIDS, 4' - 3"W. x 7' - 8"L. x 2' - 0"H., 375 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF WASTE ACIDS TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 870,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROGEN CHLORIDE, NITRIC ACID, PHOPHORIC ACID, SULFURIC ACID, AMMONIA (CAS # 7664-41-7), AND HYDROGEN FLUORIDE, SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No. G8266
A/N 503224

Equipment Description:

STORAGE TANK T-503, WASTE ACIDS, 4' - 0"W. x 6' - 5"L. x 2' - 0"H., 375 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF WASTE ACIDS TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 870,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROGEN CHLORIDE, NITRIC ACID, PHOPHORIC ACID, SULFURIC ACID, AMMONIA (CAS # 7664-41-7), AND HYDROGEN FLUORIDE, SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No. G9347
A/N 510419

Equipment Description:

WET CHEMICAL/SOLVENT CLEANING SYSTEM CONSISTING OF:

1. ACID WET BENCH, SPEC, 3' - 0"W. x 8' - 0"L. x 6' - 4"H., 1.7 KVA ELECTRICALLY POWERED.
2. SOLVENT BENCH, SPEC, 3' - 0"W. x 7' - 0"L. x 6' - 5"H., 1.7 KVA ELECTRICALLY POWERED.
3. ACID WET BENCH, LUNAIRE, FH-96PP, SERIAL NO. L-1561, 2' - 9"W. x 5' - 0"L. x 6' - 0"H., 0.3 KW.
4. TWO WET PROCESS STATIONS, SPEC, MODEL SBXAT5-80, EACH 9' - 0"W. x 5' - 0"L. x 6' - 8"H., EACH WITH ONE 6-KW HEATER AND ONE 3-KW HEATER.
5. TWO WET PROCESS STATIONS, SPEC, MODEL SBXAT5-80, 9' - 0"W. x 5' - 0"L. x 6' - 8"H., EACH WITH TWO 3-KW HEATERS.
6. FOUR ACID ETCH/CLEAN MACHINES, FSI, MODEL MERCURY, EACH 3' - 4"W. x 2' - 5"L. x 5' - 7"H., 4.4 KVA ELECTRICALLY POWERED.
7. WET NITRIDE ETCH BENCH, SUBMICRON SYSTEMS, 0' - 10.5"W. x 1' - 5"L. x 1' - 0"H.
8. TWO ACID ETCH/CLEAN MACHINES, FSI, MODEL MERCURY, 6' - 1"W. x 3' - 4"L. x 4' - 3"H., 4.4 KVA ELECTRICALLY POWERED.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS SIX ACID ETCH/CLEAN MACHINES, TWO ACID WET BENCHES, ONE SOLVENT BENCH, FOUR WET PROCESS STATIONSS, AND ONE WET NITRIDE ETCH BENCH ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

4. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSION SHALL BE THE TOTAL AMOUNT OF SOLVENT USED IN THIS EQUIPMENT, EXCLUDING SALVAGE SOLVENT, DISCOUNTED BY 95% IF THE EQUIPMENT VENTS TO MCGILL OXIDIZER, OR 98.7% IF THE EQUIPMENT VENTS TO JOHN ZINK OXIDIZER.

[RULE 1303 (b) (2)-OFFSETS]

5. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 1303 (b) (2)-OFFSETS]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No. G9348
A/N 510420

Equipment Description:

WET CHEMICAL PROCESSING AND SOLVENT CLEANING SYSTEM CONSISTING OF:

1. ELEVEN ACID ETCH/CLEAN MACHINES, FSI, MODEL MERCURY, EACH 3' - 4"W. x 2' - 5"L. x 5' - 7"H., 4.4 KVA ELECTRICALLY POWERED.
2. TWO ACID ETCHERS, SEZ, MODEL SP203, EACH 3' - 4"W. x 2' - 5"L. x 5' - 7"H., EACH 4.4 KVA ELECTRICALLY POWERED.
3. TWO QUARTZ CLEANING MACHINES, POLY FLOW, EACH 2' - 8"W. x 10' - 11"L. x 4' - 6"H., EACH 1.75 KVA ELECTRICALLY POWERED.
4. ACID WET BENCH, ULTRAFAB, 3' - 0"W. x 8' - 0"L. x 5' - 6"H., 1.8 KVA ELECTRICALLY POWERED.
5. SOURCE CLEANING BENCH, SPEC, MODEL SPH-30SST, 2' - 6"W. x 6' - 0"L. x 6' - 6"H., 1.8 KVA ELECTRICALLY POWERED.
6. MAINTENANCE BENCH, SPEC, MODEL HAC968020W, 2' - 6"W. x 3' - 0"L. x 6' - 4"H., 1.8 KVA ELECTRICALLY POWERED.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSIONS SHALL BE THE TOTAL AMOUNT OF SOLVENT USED IN THIS EQUIPMENT, EXCLUDING SALVAGE SOLVENT, AND IF VENTING TO A VOC CONTROL SYSTEM, DISCOUNTED BY 98.7% (THE CONTROL EFFICIENCY OF THE VOC CONTROL SYSTEM VENTING THIS EQUIPMENT).
[RULE 1303 (b) (2)-OFFSETS]

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

5. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 511730

Equipment Description:

INTEGRATED CIRCUIT FABRICATION SYSTEM CONSISTING OF:

1. HORIZONTAL DIFFUSION FURNACE, BTI, MODEL BDF41, 5' - 4"W. x 23' - 1"L. x 9' - 2"H., 168 KVA, WITH ONE ATMOSPHERIC TUBE, TWO NITRIDE TUBES, AND ONE LTO TUBE, EACH NITRIDE AND LTO TUBE WITH ONE FILTER TRAP, MASS-VAC, MODEL 355080, CONSISTING OF SIX STAINLESS STEEL GAUZE FILTERS AND SIX POLYPRO 2 MICRON FILTERS, AND ONE VACUUM PUMP.
2. TWO ATMOSPHERIC HORIZONTAL DIFFUSION FURNACES, BTI, MODEL BDF41, 5' - 4"W. x 23' - 1"L. x 9' - 2"H., 168 KVA.
3. FOUR ION IMPLANTERS, APPLIED MATERIALS, MODEL 9500, 17' - 0"W. x 11' - 8"L. x 7' - 11"H., EACH 65 KVA ELECTRICALLY POWERED, EACH WITH ONE 4 HP VACUUM PUMP AND ONE 2 HP VACUUM PUMP.
4. TWO ION IMPLANTERS, ULVAC, MODEL IW-630, 8' - 9"W. x 21' - 4"L. x 9' - 2"H., EACH 70 KVA ELECTRICALLY POWERED, EACH WITH ONE 4 HP VACUUM PUMP.
5. FIVE PLASMA ETCHERS, APPLIED MATERIALS, MODEL P5000, 6' - 6"W. x 6' - 4"L. x 7' - 8"H., EACH 64.7 KVA ELECTRICALLY POWERED, EACH WITH FOUR 2.5 HP VACUUM PUMPS.
6. PLASMA ETCHER, LAM, MODEL 9400 ALLIANCE, 11' - 0"W. x 7' - 10"L. x 6' - 9"H., 143.9 KVA ELECTRICALLY POWERED, WITH ONE 4 HP VACUUM PUMP AND TWO 2 HP VACUUM PUMPS.
7. PLASMA ETCHER, APPLIED MATERIALS, MODEL CENTURA, 7' - 5"W. x 3' - 1"L. x 4' - 7"H., EACH 144 KVA ELECTRICALLY POWERED, WITH FOUR 2.5-HP VACUUM PUMPS.
8. ETCHER, NOVELLUS, MODEL PEP3510A, 4' - 0"W. x 5' - 3"L. x 7' - 11"H., 54 KVA ELECTRICALLY POWERED WITH TWO 5 HP VACUUM PUMPS.
9. PLASMA ETCHER, GASONICS, MODEL L3510, 2' - 6"W. x 3' - 2"L. x 4' - 10"H., 14 KVA ELECTRICALLY POWERED, WITH ONE 5-HP VACUUM PUMP.
10. PECVD MACHINE, APPLIED MATERIALS, MODEL P5000 (DXZ OPTIMA), 6' - 4"W. x 6' - 6"L. x 7' - 8"H., 64.7 KVA ELECTRICALLY POWERED, WITH ONE FILTER TRAP, MASS-VAC, MODEL 355050, CONSISTING OF FIVE STAINLESS STEEL GAUZE FILTERS AND FIVE POLYPRO 2 MICRON FILTERS, FOUR 2.5-HP VACUUM PUMPS.
11. ION IMPLANTER, VARIAN, MODEL E500, 10' - 7.5"W. x 16' - 5.5"L. x 8' - 0"H., 75 KVA ELECTRICALLY POWERED, WITH ONE 4 HP VACUUM PUMP AND ONE 2 HP VACUUM PUMP.

Conditions:

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

[RULE 204]

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

[RULE 204]

3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS THREE DIFFUSION FURNACES, EIGHT PLASMA ETCHERS, ONE PECVD MACHINE, AND SEVEN ION IMPLANTERS ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER:

[RULE 1303 (b) (2)-OFFSETS]

4. ARSINE SHALL ONLY BE USED IN FOUR ION IMPLANTERS VENTED BY NOVAPURE DRY SCRUBBERS.

[RULE 1401]

5. THE FLOW RATE OF ARSINE TO EACH OF THE FOUR ION IMPLANTERS SHALL NOT EXCEED 0.0138 LITER PER MINUTE.

[RULE 1401]

6. THE AMOUNTS OF MATERIALS USED IN THIS EQUIPMENT SHALL NOT EXCEED THE FOLLOWING IN ANY ONE CALENDAR MONTH:

<u>MATERIALS</u>	<u>LIMITS, LBS</u>
PH ₃	5
SiH ₄	50
SiH ₂ Cl ₂	10
BF ₃	5
CHF ₃	30
CF ₄	10
Cl ₂	100
SF ₆	30
HBr	22
POCl ₃	8
CH ₃ CCl ₃	45
NF ₃	20
BCl ₃	4
C ₂ F ₆	30
TEOS	2,000
NH ₃	140

[RULE 1303 (b) (2)-OFFSETS]

7. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 5 AND 6. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 511731

Equipment Description:

INTEGRATED CIRCUIT FABRICATION SYSTEM CONSISTING OF:

1. NINE ATMOSPHERIC DIFFUSION FURNACES, BTI, MODEL BDF41, 5' - 4"W. x 23' - 1"L. x 9' - 2"H., EACH 168 KVA ELECTRICALLY POWERED, EACH WITH ONE VACUUM PUMP.
2. LPCVD DIFFUSION FURNACE, BTI, MODEL BDF41, 5' - 4"W. x 23' - 1"L. x 9' - 2"H., 168 KVA ELECTRICALLY POWERED, WITH FOUR LTO TUBES, EACH TUBE WITH ONE FILTER TRAP, MASS-VAC, MODEL 355080-S, CONSISTING OF SIX STAINLESS STEEL GAUZE FILTERS AND SIX POLYPRO 2 MICRON FILTERS, AND FOUR VACUUM PUMPS.
3. DIFFUSION FURNACE, BTI, MODEL BDF41, 5' - 4"W. x 23' - 1"L. x 9' - 2"H., 168 KVA ELECTRICALLY POWERED, WITH TWO ATMOSPHERIC TUBES AND TWO LPCVD TEOS TUBE, EACH TEOS TUBE WITH ONE FILTER TRAP, MASS-VAC, MODEL 355080-S, CONSISTING OF SIX STAINLESS STEEL GAUZE FILTERS AND SIX POLYPRO 2 MICRON FILTERS, AND FOUR VACUUM PUMPS.
4. LPCVD DIFFUSION FURNACE, BTI, MODEL BDF41, 5' - 4"W. x 23' - 1"L. x 9' - 2"H., 168 KVA ELECTRICALLY POWERED, WITH FOUR POLY TUBES, EACH TUBE WITH ONE FILTER TRAP, MASS-VAC, MODEL 355050, CONSISTING OF STAINLESS STEEL GAUZE FILTERS AND FIVE POLYPRO 2 MICRON FILTERS, AND FOUR VACUUM PUMPS.
5. FOUR PECVD MACHINES, NOVELLUS, MODEL CONEPT ONE, 3' - 2"W. x 5' - 8"L. x 6' - 8"H., 18.72 KVA ELECTRICALLY POWERED, EACH WITH ONE FILTER TRAP, MASS-VAC, MODEL 355050, CONSISTING OF STAINLESS STEEL GAUZE FILTERS AND POLYPRO 2 MICRON FILTERS, AND EACH WITH ONE 2.5 HP VACUUM PUMP AND ONE 5 HP VACUUM PUMP.
6. SIXTEEN PLASMA ETCHERS, TEGAL, MODEL T/903E, 3' - 8"W. x 3' - 6"D. x 2' - 2"H., EACH 6.24 KVA, EACH WITH ONE VACUUM PUMP.
7. TWENTY-THREE PLASMA ETCHERS, LAM, MODEL 490, 3' - 8"W. x 3' - 6"D. x 2' - 2"H., EACH 45 KVA, EACH WITH TWO 2 HP VACUUM PUMPS.
8. FIVE ION IMPLANTERS, APPLIED MATERIALS, MODEL 9500, 17' - 0"W. x 11' - 8"L. x 7' - 11"H., EACH 65 KVA, ONE 4 HP VACUUM PUMP, AND ONE 2 HP VACUUM PUMP.
9. TWO ETCHERS, GASONICS, MODEL AE2001, 2' - 8"W. x 3' - 1"L. x 4' - 7"H., 9 KVA ELECTRICALLY POWERED, WITH ONE 5 HP VACUUM PUMP.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

[RULE 204]

3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS TWELVE DIFFUSION FURNACES, THIRTY-NINE PLASMA ETCHERS, FOUR PECVD MACHINES, FIVE ION IMPLANTERS, AND TWO ETCHERS ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.

[RULE 1303 (b) (2)-OFFSETS]

4. THE FLOW RATE OF ARSINE TO EACH ION IMPLANTER SHALL NOT EXCEED 0.01 LITER PER MINUTE.

[RULE 1401]

5. THE AMOUNTS OF MATERIALS USED IN THIS EQUIPMENT SHALL NOT EXCEED THE FOLLOWING IN ANY ONE CALENDAR MONTH:

<u>MATERIALS</u>	<u>LIMITS, LBS</u>
PH ₃	5
SiH ₄	150
BF ₃	2
C ₂ F ₆	340
CHF ₃	120
Cl ₂	250
SF ₆	180
POCl ₃	30
C ₈ H ₂₀ SiO ₄	200
NF ₃	40
CH ₃ CCl ₃	70

[RULE 1303 (b) (2)-OFFSETS]

6. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 511732

Equipment Description:

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. THREE BURN BOXES, METRON, MODEL GUARDIAN GS8, EACH 1' - 9"W. x 6' - 4"L. x 4' - 10.2"H. WITH ONE HYDROGEN-FIRED BURNER, 17,496 BTU PER HOUR.
2. DRY SCRUBBER, NOVAPURE, MODEL 400 SERIES, 2' - 0"W. x 4' - 0"L. x 5' - 10"H., DUAL CANISTER CONFIGURATION TYPE (ONE STANDBY), EACH CANISTER WITH A MINIMUM OF 37 GALLONS OF RESIN, VENTING ONE ION IMPLANTER.
3. DRY SCRUBBER, NOVAPURE, MODEL 300 SERIES, 2' - 0"W. x 2' - 0"L. x 5' - 6"H., WITH 32 GALLONS OF RESIN, AND A BY-PASS CANISTER WITH A MINIMUM OF 0.3 GALLON OF RESIN, VENTING ONE ION IMPLANTER.
4. TWO DRY SCRUBBERS, NOVAPURE, MODEL EGS-237, 2' - 1"W. x 2' - 0"L. x 4' - 11"H., EACH WITH A MINIMUM OF 37 GALLONS OF RESIN, EACH VENTING ONE ION IMPLANTER.
5. SCRUBBER NO. 1, HARRINGTON, MODEL ECH 99-4TP, HORIZONTAL PACKED TYPE, 4' - 5"W. x 9' - 0"L. x 9' - 0"H., WITH 9 FEET OF NO. 2 JAEGER TRI-PACKS PACKING, A MIST ELIMINATOR, AND TWO 10-HP RECIRCULATION PUMPS.
6. SCRUBBER NO. 2, HARRINGTON, MODEL ECH 99-4TP, HORIZONTAL PACKED TYPE, 4' - 5"W. x 9' - 0"L. x 9' - 0"H., WITH 9 FEET OF NO. 2 JAEGER TRI-PACKS PACKING, A MIST ELIMINATOR, AND TWO 10-HP RECIRCULATION PUMPS.
7. EXHAUST SYSTEM WITH THREE 50-HP BLOWERS AND ONE 50-HP BACK-UP BLOWER VENTING SEVEN ION IMPLANTERS, THREE DIFFUSION FURNACES, EIGHT GAS CABINETS, TWO PLASMA ETCHERS, SIX ACID ETCHERS, EIGHT ACID WET BENCHES, THIRTY-NINE CHEMICALS STORAGE TANKS, ONE LAM ALLIANCE ETCHER, FIVE P5000 ETCHERS, ONE APPLIED MATERIALS CENTURA PLASMA ETCHER, ONE PECVD MACHINE AND ONE RTA UNIT.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. A FLOW METER, INDICATING GALLONS PER MINUTE (GPM), SHALL BE INSTALLED AND MAINTAINED IN THE SCRUBBING SOLUTION RECIRCULATION LINE TO SCRUBBER NO. 1.
[RULE 1303 (b) (2)-OFFSETS]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

4. NOT LESS THAN 150 GPM OF SCRUBBING SOLUTION SHALL BE SUPPLIED TO SCRUBBER NO. 1 NOZZLES WHENEVER THE SCRUBBER IS IN OPERATION.
[RULE 1303 (b) (2)-OFFSETS]
5. A FLOW METER, INDICATING GPM, SHALL BE INSTALLED AND MAINTAINED IN THE SCRUBBING SOLUTION RECIRCULATION LINE TO SCRUBBER NO. 2.
[RULE 1303 (b) (2)-OFFSETS]
6. NOT LESS THAN 150 GPM OF SCRUBBING SOLUTION SHALL BE SUPPLIED TO SCRUBBER NO. 2 NOZZLES WHENEVER THE SCRUBBER IS IN OPERATION.
[RULE 1303 (b) (2)-OFFSETS]
7. THE SCRUBBING SOLUTION TO THE SCRUBBER NOZZLES SHALL BE MAINTAINED AT pH 8 OR HIGHER.
[RULE 1303 (b) (2)-OFFSETS]
8. ARSINE CONCENTRATIONS AT THE OUTLETS OF THE MAIN CANISTERS, STANDBY CANISTERS, AND BY-PASS CANISTERS OF THE NOVAPURE DRY SCRUBBERS SHALL BE MONITORED CONTINUOUSLY FOR BREAKTHROUGH WITH A DISTRICT APPROVED ANALYZER.
[RULE 1401]
9. WHEN A BREAKTHROUGH OCCURS AT THE OUTLET OF A MAIN CANISTER, THE ARSINE EFFLUENT FLOW TO THAT CANISTER WILL BE AUTOMATICALLY SWITCHED TO A STANDBY CANISTER OR A BY-PASS CANISTER, AND THE SPENT MAIN CANISTER SHALL BE REPLACED WITH A FRESH CANISTER.
[RULE 1401]
10. WHEN A BREAKTHROUGH OCCURS AT THE OUTLET OF A STANDBY CANISTER OR A BY-PASS CANISTER, THE ARSINE FLOW TO THE ION IMPLANTER IT VENTS WILL BE AUTOMATICALLY SHUT DOWN AND THE SPENT CANISTER SHALL BE REPLACED WITH A FRESH CANISTER.
[RULE 1401]
11. NOTWITHSTANDING CONDITION NO. 9, FOR A DRY SCRUBBER THAT DOES NOT HAVE A STANDBY OR BY-PASS CANISTER, WHEN A BREAKTHROUGH OCCURS AT THE OUTLET OF THE CANISTER, THE ARSINE FLOW TO THE ION IMPLANTER IT VENTS WILL BE AUTOMATICALLY SHUT DOWN AND THE SPENT CANISTER SHALL BE REPLACED WITH A FRESH CANISTER.
[RULE 1401]
12. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 4, 6, 7, 8, 9, 10, AND 11. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Periodic Monitoring:

13. THE OPERATOR SHALL DETERMINE AND RECORD THE pH OF THE SCRUBBING SOLUTION ONCE EVERY DAY.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

14. THE OPERATOR SHALL DETERMINE AND RECORD THE FLOW RATE OF THE SCRUBBING SOLUTION ONCE EVERY DAY.

[RULE 3004 (a) (4)]

Emissions And Requirements:

15. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 511733

Equipment Description:

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. FIVE BURN BOXES, METRON, MODEL GUARDIAN GS8, EACH 1' - 9"W. x 6' - 4"L. x 4' - 10.2"H. WITH ONE HYDROGEN-FIRED BURNER, 17,496 BTU PER HOUR.
2. FIVE DRY SCRUBBERS, EACH NOVAPURE, MODEL 300 SERIES, 2' - 0"W. x 2' - 0"L. x 5' - 6"H., EACH WITH A MAIN CANISTER WITH A MINIMUM OF 32 GALLONS OF RESIN, A BY-PASS CANISTER WITH A MINIMUM OF 0.3 GALLON OF RESIN, EACH VENTING ONE ION IMPLANTER.
3. SCRUBBER, METRON, MODEL VECTOR 6000, 2' - 3"W. x 3' - 0.3"D. x 7' - 1"H. VENTING ONE PECVD FURNACE.
4. SCRUBBER NO. 101, HARRINGTON, MODEL ECH-1L-12-5, HORIZONTAL PACKED BED TYPE, 12' - 6"W. x 21' - 7"L. x 15' - 5"H., WITH A 12' - 0"W. x 11' - 0"H. x 5' - 0"D. BED OF 3 1/2" LANPAC PLASTIC PACKING, A 1 FOOT DEEP SINE-WAVE PLATE TYPE DEMISTER SECTION, TWO 15-HP RECIRCULATION PUMPS, AND ONE 100-HP BLOWER.
5. SCRUBBER NO. 102, HARRINGTON (STANDBY TO SCRUBBER NO. 101), MODEL ECH-1L-12-5, HORIZONTAL PACKED BED TYPE, 12' - 6"W. x 21' - 7"L. x 15' - 5"H., WITH A 12' - 0"W. x 11' - 0"H. x 5' - 0"D. BED OF 3 1/2" LANPAC PLASTIC PACKING, TWO 15-HP RECIRCULATION PUMPS, AND ONE 100-HP BLOWER.
6. EXHAUST SYSTEM VENTING TWELVE DIFFUSION FURNACES, FOUR PECVD MACHINES, THIRTY-EIGHT GAS CABINET PURGE LINES, FIVE ION IMPLANTERS, THIRTY-NINE PLASMA ETCHERS, FIFTEEN ETCHERS, THREE WAFER GRINDERS, FOUR WASTE ACID STORAGE TANKS, ONE WASTE AMMONIUM HYDROXIDE STORAGE TANK, ONE WASTE WATER STORAGE TANK, THREE WAFER ETCHING AND STRIPPING LINES, ONE MAINTENANCE BENCH, THREE ACID WET BENCHES, TWO QUARTZ CLEANING MACHINES, TWO ACID STORAGE CABINETS, ONE DRAG SOLDER MACHINE AND ONE REFLOW OVEN.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. A FLOW METER, INDICATING GALLONS PER MINUTE (GPM), SHALL BE MAINTAINED IN THE SCRUBBING SOLUTION RECIRCULATION LINE TO SCRUBBER NO. 101.
[RULE 1303 (b) (2)-OFFSETS]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

4. A FLOW METER, INDICATING GALLONS PER MINUTE (GPM), SHALL BE MAINTAINED IN THE SCRUBBING SOLUTION RECIRCULATION LINE TO SCRUBBER NO. 102.
[RULE 1303 (b) (2)-OFFSETS]
5. NOT LESS THAN 462 GPM OF SCRUBBING SOLUTION SHALL BE SUPPLIED TO THE SCRUBBER NOZZLES SERVING SCRUBBER NO. 101 WHENEVER SCRUBBER NO. 101 IS IN OPERATION.
[RULE 1303 (b) (2)-OFFSETS]
6. NOT LESS THAN 462 GPM OF SCRUBBING SOLUTION SHALL BE SUPPLIED TO THE SCRUBBER NOZZLES SERVING SCRUBBER NO. 102 WHENEVER SCRUBBER NO. 102 IS IN OPERATION.
[RULE 1303 (b) (2)-OFFSETS]
7. SCRUBBING SOLUTION TO THE SCRUBBER NOZZLES SHALL BE MAINTAINED AT pH 8 OR HIGHER.
[RULE 1303 (b) (2)-OFFSETS]
8. ARSINE CONCENTRATIONS AT THE OUTLETS OF THE MAIN CANISTERS AND BY-PASS CANISTERS OF THE NOVAPURE DRY SCRUBBERS SHALL BE MONITORED CONTINUOUSLY FOR BREAKTHROUGH WITH A DISTRICT APPROVED ANALYZER.
[RULE 1401]
9. WHEN A BREAKTHROUGH OCCURS AT THE OUTLET OF A MAIN CANISTER, THE ARSINE EFFLUENT FLOW TO THAT CANISTER WILL BE AUTOMATICALLY SWITCHED TO THE BY-PASS CANISTER AND THE SPENT MAIN CANISTER SHALL BE REPLACED WITH A FRESH CANISTER.
[RULE 1401]
10. WHEN A BREAKTHROUGH OCCURS AT THE OUTLET OF A BY-PASS CANISTER, THE ARSINE FLOW TO THE ION IMPLANTER IT VENTS WILL BE AUTOMATICALLY SHUT DOWN AND THE SPENT CANISTER SHALL BE REPLACED WITH A FRESH CANISTER.
[RULE 1401]
11. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 5, 6, 7, 8, 9, AND 10. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Periodic Monitoring:

12. THE OPERATOR SHALL DETERMINE AND RECORD THE FLOW RATE OF THE SCRUBBING SOLUTION ONCE EVERY DAY.
[RULE 3004 (a) (4)]
13. THE OPERATOR SHALL DETERMINE AND RECORD THE pH OF THE SCRUBBING SOLUTION ONCE EVERY DAY.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

Emissions And Requirements:

14. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 11735

Equipment Description:

PHOTOLITHOGRAPHIC SYSTEM CONSISTING OF:

1. THREE PHOTOLITHOGRAPHIC TRACKS, SVG, MODEL 86 SERIES, EACH 4' - 2"W. x 9' - 0"L. x 3' - 4"H., AND EACH 12.5 KVA.
2. TWO PHOTOLITHOGRAPHIC TRACKS, DNS, MODEL 80B, EACH 4' - 8"W. x 13' - 2"L. x 5' - 9"H., AND EACH 40.1 KVA.
3. PHOTORESIST MACHINE, STRIPPING, RHETECH, MODEL CLASS 1, 3' - 6"W. x 6' - 6"L. x 5' - 3"H., 12.5 KVA.
4. PHOTORESIST MACHINE, STRIPPING, RHETECH, MODEL SST-260, 2' - 8"W. x 7' - 0"L. x 5' - 0"H., 18 KVA ELECTRICALLY POWERED.
5. TWO PHOTOLITHOGRAPHIC TRACKS, TEL MARK 7, 4' - 6"W. x 14' - 0"L. x 6' - 8"H., 25.6 KVA ELECTRICALLY POWERED.
6. PHOTOLITHOGRAPHIC TRACK, SVG, MODEL 88 SERIES, 4' - 2"W. x 9' - 0"L. x 3' - 4"H., 21.6 KVA ELECTRICALLY POWERED.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS EIGHT PHOTOLITHOGRAPHIC TRACKS AND TWO PHOTORESIST MACHINES ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1164]
4. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSIONS SHALL BE THE TOTAL AMOUNT OF SOLVENT AND PHOTORESIST USED IN THIS EQUIPMENT, EXCLUDING SALVAGE SOLVENT AND PHOTORESIST, DISCOUNTED BY THE NON-VOLATILE PORTION OF THE PHOTORESIST, AND THEN DISCOUNTED BY 95% IF THE EQUIPMENT VENTS TO MCGILL OXIDIZER, OR 98.7% IF THE EQUIPMENT VENTS TO JOHN ZINK OXIDIZER.
[RULE 1303 (b) (2)-OFFSETS]

**FACILITY PERMIT TO OPERATE
INTERNATIONAL RECTIFIER HEXFET AMERICA**

5. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

**Permit No.
A/N 511736**

Equipment Description:

TWENTY-ONE PHOTOLITHOGRAPHIC TRACKS, SVG, MODEL 88 SERIES, 4' - 2"W. x 9' - 0"L. x 3' - 4"H., 21.6 KVA.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1164]
4. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSIONS SHALL BE THE TOTAL AMOUNT OF PHOTORESIST USED IN THIS EQUIPMENT, EXCLUDING SALVAGE PHOTORESIST, DISCOUNTED BY THE NON-VOLATILE PORTION OF THE PHOTORESIST, AND THEN DISCOUNTED BY 98.7% (THE CONTROL EFFICIENCY OF THE CONTROL SYSTEM VENTING THIS EQUIPMENT).
[RULE 1303 (b) (2)-OFFSETS]
5. RECORDS SHALL BE KEPT TO DEMONSTRATE COMPLIANCE WITH CONDITION NO. 4. THE RECORDS SHALL BE MAINTAINED ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 511737

Equipment Description:

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. WASTE GAS BLOWER.
2. THERMAL OXIDIZER, MCGILL, MODEL V-100, HORIZONTAL CYLINDRICAL TYPE, WASTE GAS/NATURAL GAS DIRECT FIRED, 5' - 0"DIA. x 10' - 0"L. (COMBUSTION CHAMBER), 5,000,000 BTU PER HOUR.
3. PREHEAT EXCHANGER, E-101, ECLIPSE, PLATE TYPE.
4. EXHAUST SYSTEM WITH ONE 40-HP BLOWER VENTING EIGHT PHOTOTRACKS, TWO PHOTORESIST MACHINES, ONE WASTE SOLVENT STORAGE TANK, AND ONE SOLVENT BENCH.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. A TEMPERATURE INDICATOR SHALL BE INSTALLED TO MEASURE THE COMBUSTION CHAMBER TEMPERATURE.
[RULE 1303 (a) (1)-BACT]
4. A TEMPERATURE OF NOT LESS THAN 1400°F SHALL BE MAINTAINED IN THE COMBUSTION CHAMBER WHEN THE EQUIPMENT IT SERVES IS IN OPERATION EXCLUDING A STARTUP PERIOD NOT TO EXCEED 30 MINUTES.
[RULE 1303 (a) (1)-BACT]
5. THE OVERALL VOC CONTROL EFFICIENCY (COLLECTION AND DESTRUCTION) OF THIS EQUIPMENT SHALL NOT BE LESS THAN 95.0%.
[RULE 1303 (b) (2)-OFFSETS, RULE 1164]
6. A NON-RESETTABLE FUEL FLOWMETER, INDICATING CUBIC FEET, SHALL BE INSTALLED IN THE NATURAL GAS SUPPLY LINE TO THIS EQUIPMENT.
[RULE 1303 (b) (2)-OFFSETS; RULE 1401]
7. THE TOTAL QUANTITY OF NATURAL GAS CONSUMED IN THIS OXIDIZER AND JOHN ZINK OXIDIZER SHALL NOT EXCEED 3,428,570 STANDARD CUBIC FEET IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS; RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

8. THIS AIR POLLUTION CONTROL (APC) SYSTEM SHALL NOT BE USED TO VENT ANY EQUIPMENT THAT IS USING HALOGENATED HYDROCARBONS.

[RULE 401]

9. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4, 5, 7, AND 8. THE RECORDS SHALL BE KEPT FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

[RULE 3004 (a) (4)]

Periodic Monitoring:

10. THE OPERATOR SHALL INSTALL AND MAINTAIN A DEVICE TO CONTINUOUSLY RECORD THE TEMPERATURE OF THE COMBUSTION CHAMBER.

[RULE 3004 (a) (4)]

Emissions And Requirements:

11. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

CO: 2000 PPMV, RULE 407

PM: 0.1 GR/SCF, RULE 409

PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

**Permit No.
A/N 511738**

Equipment Description:

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. THERMAL OXIDIZER, JOHN ZINK, HORIZONTAL TYPE, 5,000,000 BTU PER HOUR, NATURAL GAS-FIRED, WITH AN ECONOMIZER.
2. EXHAUST SYSTEM WITH TWO 25-HP BLOWERS (ONE STANDBY) VENTING TWENTY-NINE PHOTOTRACKS, WAFER ETCHING AND STRIPPING LINES NO. 2 AND NO. 3, TWO PHOTORESIST STRIPPING MACHINES, AND FOUR SOLVENT BENCHES.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. TEMPERATURE MEASUREMENT AND RECORDING DEVICE WITH AN ACCURACY OF ± 20 DEGREES FAHRENHEIT SHALL BE INSTALLED AND MAINTAINED AT THE OUTLET OF THE COMBUSTION CHAMBER.
[RULE 3004 (a) (4)]
4. WHENEVER THE OXIDIZER IS IN OPERATION, THE TEMPERATURE AT THE OUTLET OF THE COMBUSTION CHAMBER (AS SHOWN ON THE INSTRUMENT DESCRIBED UNDER CONDITION NO. 3) SHALL NOT BE LESS THAN 1400 DEGREES FAHRENHEIT.
[RULE 1303 (b) (2)-OFFSETS]
5. THE OVERALL VOC CONTROL EFFICIENCY (COLLECTION AND DESTRUCTION) OF THIS EQUIPMENT SHALL NOT BE LESS THAN 98.7%.
[RULE 1303 (b) (2)-OFFSETS]
6. THIS AIR POLLUTION CONTROL (APC) SYSTEM SHALL NOT BE USED TO VENT ANY EQUIPMENT THAT IS USING HALOGENATED HYDROCARBONS.
[RULE 401]
7. A NON-RESETTABLE FUEL FLOWMETER, INDICATING CUBIC FEET, SHALL BE INSTALLED IN THE NATURAL GAS SUPPLY LINE TO THIS EQUIPMENT.
[RULE 1303 (b) (2)-OFFSETS; RULE 1401]
8. THE TOTAL QUANTITY OF NATURAL GAS CONSUMED IN THIS OXIDIZER AND MCGILL OXIDIZER SHALL NOT EXCEED 3,428,570 STANDARD CUBIC FEET IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS; RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

9. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4, 5, 6 AND 8. THE RECORDS SHALL BE KEPT FOR AT LEAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Emissions And Requirements:

10. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:
CO: 2000 PPMV, RULE 407
PM: 0.1 GR/SCF, RULE 409
PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No.
A/N 511739

Equipment Description:

STORAGE TANK T-517, WASTE ACIDS, 4' - 0"DIA. x 5' - 7"L., 500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]
4. THIS EQUIPMENT SHALL NOT RECEIVE MORE THAN 400,000 GALLONS OF WASTE ACIDS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS USED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY TOXIC AIR CONTAMINANTS IDENTIFIED IN RULE 1401, TABLE I, WITH AN EFFECTIVE DATE OF MARCH 7, 2008 OR EARLIER, EXCEPT FOR NITRIC ACID (CAS # 7697-37-2), HYDROCHLORIC ACID (CAS # 7647-01-0), SULFURIC ACID (CAS # 7664-93-9), PHOSPHORIC ACID (CAS # 7664-38-2), SODIUM HYDROXIDE (CAS # 1310732), CHROMIC TRIOXIDE [AS CHROMIC ACID] (CAS # 1333-82-0), COPPER AND COPPER COMPOUNDS (CAS # 7440508), HYDRAZINE (CAS # 302012), ETHYLENE GLYCOL MONOBUTYL ETHER (CAS # 111762), ETHYLENE GLYCOL (CAS # 107-21-1), AMMONIA (CAS # 7664-41-7), AND HYDROFLUORIC ACID (CAS # 7664-39-3).
[RULE 1401]
6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No.
A/N 511741

Equipment Description:

STORAGE TANK T-14, WASTE ACIDS, 10' - 0"DIA. x 11' - 6"L., 5,728 GALLON CAPACITY, WITH TWO 10 HP TRANSFER PUMPS.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THE MAXIMUM AMOUNT OF WASTE ACIDS TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 2,410,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
4. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED A PERMIT TO OPERATE BY THE EXECUTIVE OFFICER.
[RULE 1303 (a) (1)-BACT]
5. MATERIALS USED IN THIS EQUIPMENT SHALL NOT CONTAIN ANY TOXIC AIR CONTAMINANTS IDENTIFIED IN RULE 1401, TABLE I, WITH AN EFFECTIVE DATE OF MARCH 7, 2008 OR EARLIER, EXCEPT FOR NITRIC ACID (CAS # 7697-37-2), PHOSPHORIC ACID (CAS # 7664-38-2), HYDROFLUORIC ACID (CAS # 7664-39-3), SODIUM HYDROXIDE (CAS # 1310732), CHROMIC TRIOXIDE [AS CHROMIC ACID] (CAS # 1333-82-0), COPPER AND COPPER COMPOUNDS (CAS # 7440508), ETHYLENE GLYCOL (CAS # 107-21-1), HYDRAZINE (CAS # 302012), ETHYLENE GLYCOL MONOBUTYL ETHER (CAS # 111762), SULFURIC ACID (CAS # 7664-93-9), AMMONIA (CAS # 7664-41-7), AND HYDROCHLORIC ACID (CAS # 7647-01-0).
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 3 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No.
A/N 511742

Equipment Description:

MIXING TANK T-151, BUFFERED OXIDE ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY, WITH ONE 0.43 HP MIXER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 3,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROFLUORIC ACID (CAS # 7664-39-3), SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No.
A/N 511744

Equipment Description:

HOLDING TANK T-155, HYDROCHLORIC ACID, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
[RULE 1303 (b) (2)-OFFSETS]
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 1,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROCHLORIC ACID (CAS # 7647-01-0), SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
6. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4 AND 5. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO OPERATE

Permit No.
A/N 511745

Equipment Description:

STORAGE TANK T-141, HYDROFLUORIC ACID, 7' - 0"DIA. x 20' - 6"L., 5,000 GALLON CAPACITY.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS IT IS VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL OPERATION AND HAS BEEN ISSUED AN OPERATING PERMIT BY THE EXECUTIVE OFFICER.
4. THE MAXIMUM AMOUNT OF MATERIAL TRANSFERED THROUGH THIS TANK SHALL NOT EXCEED 30,000 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. CONCENTRATION OF HYDROFLUORIC ACID IN SOLUTION STORED IN THIS EQUIPMENT SHALL NOT EXCEED 1 PERCENT BY WEIGHT.
6. MATERIALS CONTAINING ANY TOXIC AIR CONTAMINANTS SPECIFIED IN RULE 1401 AMENDED MAY 2, 2005, EXCEPT HYDROFLUORIC ACID (CAS # 7664-39-3), SHALL NOT BE STORED IN THIS EQUIPMENT.
[RULE 1401]
7. THE OPERATOR SHALL MAINTAIN RECORDS TO DEMONSTRATE COMPLIANCE WITH CONDITION NOS. 4, 5 AND 6. THE RECORDS SHALL BE KEPT FOR THE MOST RECENT FIVE YEAR PERIOD AND MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

PERMIT TO CONSTRUCT/OPERATE

Permit No.
A/N 511746

Equipment Description:

WAFER ETCHING AND STRIPPING LINE NO. 3, AKRION GAMA SERIES, CONSISTING OF:

1. TANK NO. 1, ETCHING/MILLING, HYDROGEN FLUORIDE/AMMONIUM FLUORIDE, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 3-KW HEATER.
2. TANK NO. 4, STRIPPING, SULFURIC ACID/HYDROGEN PEROXIDE, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 8-KW HEATER.
3. TANK NO. 6, RINSING/DRYING, DEIONIZED WATER WITH ISOPROPYL ALCOHOL, 0' - 9.5"W. x 1' - 4.5"L. x 0' - 11.5"H., WITH ONE 3-KW HEATER.
4. ASSOCIATED RINSE TANKS.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS TANKS 1, 4 AND 6 ARE VENTED ONLY TO AIR POLLUTION CONTROL EQUIPMENT WHICH IS IN FULL USE AND WHICH HAS BEEN ISSUED AN OPERATING PERMIT.
[RULE 1303 (a) (1)-BACT]
4. THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED IN THIS EQUIPMENT SHALL NOT EXCEED 10 GALLONS IN ANY ONE CALENDAR MONTH.
[RULE 1303 (b) (2)-OFFSETS]
5. VOC EMISSIONS FROM THIS EQUIPMENT SHALL BE CALCULATED AND RECORDED. THE VOC EMISSIONS SHALL BE THE TOTAL AMOUNT OF ISOPROPYL ALCOHOL USED IN THIS EQUIPMENT.
[RULE 1303 (b) (2)-OFFSETS]
6. RECORDS SHALL BE MAINTAINED TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 4 AND 5. THE RECORDS SHALL BE KEPT ON FILE FOR AT LEAST THE LAST FIVE YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
[RULE 1303 (b) (2)-OFFSETS, RULE 1401]

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

RULE 219 EQUIPMENT

Equipment Description:

RULE 219 EXEMPT EQUIPMENT, COATING EQUIPMENT, PORTABLE, ARCHITECTURAL COATINGS.

Periodic Monitoring:

1. THE OPERATOR SHALL KEEP RECORDS, IN A MANNER APPROVED BY THE DISTRICT, FOR THE FOLLOWING PARAMETER(S) OR ITEM(S):

FOR ARCHITECTURAL APPLICATIONS WHERE NO THINNERS, REDUCERS, OR OTHER VOC CONTAINING MATERIALS ARE ADDED, MAINTAIN SEMI-ANNUAL RECORDS OF ALL COATINGS CONSISTING OF (a) COATING TYPE, (b) VOC CONTENT AS SUPPLIED IN GRAMS PER LITER (g/L) OF MATERIALS FOR LOW-SOLIDS COATINGS, (c) VOC CONTENT AS SUPPLIED IN g/L OF COATING, LESS WATER AND EXEMPT SOLVENT, FOR OTHER COATING.

FOR OTHER ARCHITECTURAL APPLICATIONS WHERE THINNERS, REDUCERS, OR OTHER VOC CONTAINING MATERIALS ARE ADDED, MAINTAIN DAILY RECORDS FOR EACH COATING CONSISTING OF (a) COATING TYPE, (b) VOC CONTENT AS APPLIED IN GRAMS PER LITER (g/L) OF MATERIALS USED FOR LOW-SOLIDS COATINGS, (c) VOC CONTENT AS APPLIED IN g/L OF COATING, LESS WATER AND EXEMPT SOLVENT, FOR OTHER COATING.

[RULE 3004 (a) (4)]

Emissions And Requirements:

2. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATION:

VOC: RULE 1113, SEE APPENDIX B FOR EMISSION LIMITS

VOC: RULE 1171, SEE APPENDIX B FOR EMISSION LIMITS

FACILITY PERMIT TO OPERATE INTERNATIONAL RECTIFIER HEXFET AMERICA

RULE 219 EQUIPMENT

Equipment Description:

RULE 219 EXEMPT EQUIPMENT, HAND WIPING OPERATIONS.

Emissions And Requirements:

1. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATION:

VOC: RULE 1171, SEE APPENDIX B FOR EMISSION LIMITS