Company Name:	FinnChem USA Inc.	**Permit Writer:**	Snezana Popova
Permit Number:	CM-1900-0172	**Date:**	11-05-2013

DATE APPLICATION RECEIVED: March 6, 2013, revisions/additional information through June 20, 2013

FACILITY DESCRIPTION

This facility produces sodium chlorate ($NaClO_3$) at a production capacity of 260 short tons per day. The primary use of sodium chlorate is as a raw material for the production of chlorine dioxide as a bleaching agent in the kraft pulp industry.

FinnChem produces sodium chlorate in four lines. Each line consists of nine individual cells in series. By-product hydrogen gas is generated from the electrolysis that takes place in each cell. The by-product hydrogen gas contains some chlorine. The hydrogen gas is scrubbed in the hydrogen scrubbers that belong to each line to remove the chlorine. FinnChem uses the scrubbed hydrogen gas as the primary fuel for the two boilers on site. Back up fuel is No. 2 Fuel Oil with ≤ 0.05% sulfur content. Upon combustion, the remaining chlorine in the hydrogen gas converts to HCl, resulting in HCl emissions from the boilers. Following are more details describing the processes at this facility.

The production process consists of passing DC electricity through a solution of sodium chloride brine under controlled temperature and pH conditions. Sodium dichromate is added to the solution as a catalyst. Where the solution is exposed to air, a low concentration of chlorine fumes result. These exposed areas will be connected to air exhaust packed-bed caustic scrubber. The sodium dichlorate solution is treated in the dehypo system with hydrogen peroxide solution to remove the active chlorine so that fumes will not occur in downstream process vessels. The equipment used here is HCl storage tank (7), HCl dilution tank (8) and dehypo system (5).

Each line has its own hydrogen handling system and packed-bed caustic scrubber. Lines 10 and 20 are associated with chlorate cell (3) with their emissions going to hydrogen scrubbers (11) and (12) respectively. Lines 30 and 40 are associated with chlorate cell (4) with their emissions going to hydrogen scrubbers (13) and (14) respectively.

Sodium chlorate is recovered and purified by crystallization. Wet sodium chlorate crystals are dried in two 7.0 ton/hr, each fluidized-bed dryers. The facility will have two crystallizers (21, 22) and two fluidized-bed dryers (23, 24). Exhaust air from each dryer is scrubbed to remove dust in a thee-stage impingement scrubber (25, 26).

After drying, the sodium chlorate crystals are conveyed to two storage silos (27) by pneumatic conveying systems. Both silo vents are ducted to a three-stage impingement Silo Dust Scrubber (28) to remove dust from the conveying air. The crystals are then loaded out of the silos into rail cars with a screw conveyor feeding into loading spouts. Each spout is ducted to a common air exhaust system with a three-stage impingement Loading Dust Scrubber (29) to control dust.

Steam for this facility is provided by two identical 49.4 million Btu/hr boilers. The primary fuel for the boilers is byproduct hydrogen gas produced in the chlorate cells. When hydrogen is unavailable, No. 2 fuel oil is used as the back-up fuel. Condensate is recovered and recycled to the boilers. A 30,000-gallon storage tank is used to store No.2 Fuel Oil as back-up fuel for the boilers.

This facility is considered collocated with the FinnChem (1900-0206) facility. According to the "Guidance for major source determinations for collocated facilities", both facilities would need to receive the same type of permit. Both facilities have requested Conditional Major Operating Permits.

PROJECT DESCRIPTION

On March 6, the Bureau received a request to renew the Conditional Major Permit for the facility.

COLLOCATION DETERMINATION

Finnchem operates two facilities that are located on nearby properties in Eastover, South Carolina: a sodium chlorate manufacturing facility (Permit No. CM-1900-0172) and the anode manufacturing facility (Permit No. CM-1900-0206). These facilities meet the "major source" definition set forth in Title 40 of the Code of Federal Regulations (CFR) Part 70.2 defining as major "any stationary source (or any group of stationary sources that are located on one or more contiguous or adjacent properties, and are under common control of the same person (or persons under common control)) belonging to a single major industrial grouping" based on the following:
-The two abovementioned Finnchem facilities are located approximately 90 feet apart and are separated by Wateree Road and a right-of-way for a future rail spur, which is owned by SCE&G.
-Both the anode manufacturing facility and the sodium chlorate manufacturing facility are owned by Finnchem.

-The operations for both the anode manufacturing facility and the sodium chlorate manufacturing facility are described by SIC code 2819 (Industrial Inorganic Chemicals).

Therefore, for Title V and Title II (HAPs) permitting purposes, the two facilities are considered collocated and emissions from both facilities must be considered with respect to Title V permitting thresholds even though each facility maintains a separate air permit.

CHANGES SINCE LAST OP ISSUANCE

Following is a description of the changes in this renewal application with respect to the 2008 permit renewal application for CM-1900-0172.

The facility used the method used in the original 1998 permit application for the plant to estimate the NOx emissions from the boilers, since there have been no changes to the boilers since 1998 and showed that there are no increases in NOx emissions since the last version of modeling was performed.

·Updated plant production rate so that it's consistent for all sources at the plant (didn't result in a substantial difference in emissions);

A SCREEN 3 modeling analysis was completed for HCl and CO. PM10, and PM2.5 were less than 1.0 lb/hr and are exempt from the dispersion modeling.

SOURCE TEST REQUIREMENTS

None required at this time based on the results from the previous, 2002 test, the stack test showed 0.140 lb/hr HCl emission from the boiler which is less than the calculated HCl uncontrolled emissions for this renewal, and 0.00375 lbHCl/MMBtu that is below the allowable Standard 3 limit of 0.45 lbHCl/MMBtu.

SPECIAL CONDITIONS, MONITORING, LIMITS-

- In accordance with SC Regulation 61-62.5, Standard No. 3, Waste Combustion and Reduction, Hydrochloric Acid (HCl) emissions from this source shall not exceed 0.45 lb/Million Btu total heat input. No stack test will be required for this renewal, based on the previous stack test resulting in lower HCl emissions than the ones estimated in this application...
- In accordance with SC Regulation 61-62.1, Section II.G, this facility is also limited to less than 25 tons of total HAPs and less than 10 tons of a single HAP to avoid being a major source for Title V applicability. The owner/operator shall continue to operate, and maintain liquid flow meters and pH meters on each scrubber module and pH meters. Also, the owner/operator shall maintain consumption records of all process-related materials containing hazardous air pollutants (HAP). The twelve month rolling sum of these pollutants shall be less than the major thresholds.
- In accordance with SC Regulation 61-62.1, Section II.E, to avoid being a major source for Prevention of Significant Deterioration (PSD), the facility has a Federally enforceable operating limitation to reduce its potential to emit to less than 100 tons per year of PM, PM_{10} and, $PM_{2.5}$. In order to comply with this limitation the owner/operator shall not operate without all control devices online and operating at all times of process equipment operating.
- The boilers are subject to subparts A and Dc. Records of the amounts of fuel combusted each day, sulfur content, and submittal of fuel oil certification satisfy the requirements of this Subpart.
- In accordance with SC Regulation 61-62.1, Section II.E, to avoid being a major source for Prevention of Significant Deterioration (PSD), this facility has accepted a 100 tpy federally enforceable SO_2 emission limit. The owner/operator shall record daily fuel usage of all fuels combusting in this source.
- In accordance with SC Regulation 61-62.1, Section II.G, to avoid being a major source, the facility has a Federally enforceable operating limitation to reduce its potential to emit to less than 100 tons per year of PM_{10} and SO_2 as defined by SC Regulation 61-62.70.2.(r)(2)-Title V Operating Permit Program.
- In accordance with S.C. Regulation 61-62.5, Standard No. 4 - Emissions from Process Industries, Section VIII - Other Manufacturing, particulate matter emissions from a process shall be limited to the rate specified by use of the following equation: $E = 4.10P^{0.67.}$ .The owner/operator shall continue to operate and maintain pressure drop gauge(s) on each module of the baghouse(s). Pressure drop readings shall be recorded each shift during source operation.
- In accordance with SC Regulation 61-62.1, Section II.E, to avoid being a major source for the Prevention of Significant Deterioration (PSD), the facility has a Federally enforceable operating limitation to reduce its potential to emit to less than 100 tons per year of PM and SO_2 emissions.

As fuel oil No. 2 can only be gotten in 0.05 and 0.0015 sulfur content, the facility would no longer need a limit for this pollutant in

order to avoid the PSD applicability.

EMISSIONS

Boilers

Design Heat Input Rating: 49.4 MMBtu/hr per boiler
Maximum Heat Input Rating Firing Hydrogen: □MMBtu/hr for both boilers
Remaining Heat Input from Fuel Oil□MMBtu/hr for both boilers
Rated production based on □ cells on-line, □ kA, □% current efficiency = 261.25 tpd
Hydrogen Production based on □% current efficiency, 121.6 lb/Ton NaClO3; 61,100 BTU/lb high heat value[8]
Full Load H_2 production[8]: □lb/hr
Boiler HCl Emission Rate[7]: 0.00359 lb/MMBtu
Boiler HCl Emissions at 100% H2 Use For Both Boilers: □lbs/hr
HCl Emissions per Boiler: 0.18 lbs/hr

PTE per boiler (49.4 MMBtu/h)

Pollutant	No. 2 Fuel Oil AP-42 Emission Factor[3] (lb/10^3 gal)	No. 2 Fuel Oil Emission Factor[4,5] (lb/MMBtu)	No. 2 Fuel Oil PTE[1] (lbs/hr)	No. 2 Fuel Oil PTE[2] (tons/year)
NO_x	20	0.14	7.1	31
CO	5	0.036	1.8	7.7
SO_2	7.1	0.051	2.5	11
PM (total) - filterable + condensible	3.3	0.024	1.2(1.85)	5.1
PM_{10} - filterable + condensible	2.3	0.016	0.81	3.6
$PM_{2.5}$ - filterable + condensible	1.6	0.011	0.55	2.4
VOC	0.2	0.0014	0.071(0.11)	0.31
CO_2	--	163	8,055	35,280
CH_4	--	0.0066	0.33	1.4
N_2O	--	0.0013	0.065	0.29
CO_2e	--	--	8,082	35,399

Emissions per boiler (49.4 MMBtu/h)-cont

Pollutant	Hydrogen Emission Factor[6] (lb/MMBtu)	Hydrogen PTE[7] (lbs/hr)	Hydrogen PTE[7] (tons/year)	Worst Case PTE (lbs/hr)	Worst Case PTE (tons/year)
NO_x	0.15	7.4	32	7.4	32
CO	0.15	7.3	32	7.3	32
SO_2	--	--	--	2.5	11
PM (total) - filterable +	0.050	2.5	11	2.5	11

Pollutant	Hydrogen Emission Factor[6] (lb/MMBtu)	Hydrogen PTE[7] (lbs/hr)	Hydrogen PTE[7] (tons/year)	Worst Case PTE (lbs/hr)	Worst Case PTE (tons/year)
condensible					
PM_{10} - filterable + condensible	--	--	--	0.81	3.6
$PM_{2.5}$ - filterable + condensible	--	--	--	0.55	2.4
VOC	--	--	--	0.071	0.31
CO_2	--	148	649	8,055	35,280
CH_4	--	--	--	0.33	1.4
N_2O	--	--	--	0.065	0.29
CO_2e	--	148	649	8,082	35,399
HAPs					
Hydrogen Chloride (HCl)		0.18	0.78	0.18	0.78

1. Emission Factor in lb/MMBtu multiplied by the Rated Capacity Input of the Boiler.
2. Potential to Emit (PTE) based on 8,760 hours of operation per year. PTE in tons per year equals the lb/hr emissions multiplied by 8,760 hrs/yr and divided by 2000 lbs/ton.
3. AP-42 Emission Factors for Fuel Oil Combustion (AP-42, Section 1.3, May 2010); assume sulfur content of fuel ≤ 0.05%
4. Emission factors based on average No. 2 Fuel Oil higher heating value of 140 MMBtu/103 gal. To convert from lb/103 gal to lb/MMBtu, divide by 140.
5. Emission factors for GHG emissions (CO2, CH4, N2O, and CO2e) from 40 CFR Part 98, Subpart C, Table C-1. GWPs from 40 CFR Part 98.
6. Memo to File, Eastover Project - Boiler Emissions, Information received verbally from Allan Nethery - Babcock & Wilcox, February 24, 1998
7. August 8-9, 2001 Stack Test Results: max. CO2 concentration = 0.3% at 7,210 dscfm; conservatively assumed that both boilers could run on hydrogen at full heat input capacities even though facility does not produce enough hydrogen to operate in that manner.

Sulfur Content in No. 2 Fuel Oil =0.05 %

Sodium Chlorate Production process (ID 03)

Following is the equipment for Emission Unit ID 03

5,7,8	9	Dehypo System, 28,800-gallon HCl Storage Tank, 4,200-gallon HCl Dilution Tank	Air Exhaust Scrubber	0.0012	0.0026	--	--	--
10	11	Sodium Chlorate Production Line 10	Line 10 Hydrogen Scrubber	--	0.058	--	--	--
20	12	Sodium Chlorate Production Line 20	Line 20 Hydrogen Scrubber	--	0.058	--	--	--
30	13	Sodium Chlorate Production Line 30	Line 30 Hydrogen Scrubber	--	0.058	--	--	--
40	14	Sodium Chlorate Production Line 40	Line 40 Hydrogen Scrubber	--	0.058	--	--	--
23	25	Fluidized Bed Dryer A and Crystallizer	Dryer A Dust Scrubber	--	--	2.8	0.32	0.32
24	26	Fluidized Bed Dryer B and Crystallizer	Dryer B Dust Scrubber	--	--	2.8	0.32	0.32
27	28	Sodium Chlorate Crystal Pneumatic Conveying Systems and 2 Storage Silos	Silo Dust Scrubber	--	--	0.21	0.043	0.043

5,7,8	9	Dehypo System, 28,800-gallon HCl Storage Tank, 4,200-gallon HCl Dilution Tank	Air Exhaust Scrubber	0.0012	0.0026	--	--	--
W270	29	Sodium Chlorate Crystal Screw Conveying and Rail Car Loading System	Loading Dust Scrubber	--	--	0.30	0.063	0.063
N/A	N/A	Fugitive Leaks	N/A	--	0.012	--	--	--

Air exhaust scrubber

Equipment Specifications[1]:			
Description:		Packed Bed Scrubber	
Pressure Drop:		2-3	in. w.c.
Inlet Temperature:		Ambient	
Outlet Temperature:		95	°F
Inlet Gas Flow Rate:		□	acfm
Outlet Gas Flow Rate:			acfm
HCl Control efficiency:		99	%
Cl_2 Control efficiency[2]:		99.9	%
Liquid Injection Rate:		35-50	gpm
Additive Concentration:			
	NaOH	40	g/L
	$Na_2S_2O_3$	4-5	g/L
Given[1]:			
Sodium chlorate plant production rate:		261.25	TPD
Maximum plant operating schedule:		24	hours/day
		8,760	hours/year
Actual plant operating schedule:		□	hours/year
lbs HCl/ton $NaClO_3$ @32% sol.:			
HCl partial pressure of 32% sol @85°F:			mm Hg
HCl partial pressure of 10% sol @85°F:		0.011	mm Hg
Volume of 1 lb.mole @32°F and 1 atm. (760 mm Hg):		359	ft^3
Specific gravity of 32% HCl solution:		1.15	
MW of HCl:		36.46	
Dilute HCl tank vent flow rate:		100	cfm
Typical Cl_2 emission rate @ hydrogen scrubber outlet from previous stack tests at similar Huron plants:		0.012	lb/hr
Estimated Cl_2 emissions from ventilation scrubber versus hydrogen scrubber:		□	%
Typical scrubber outlet flow rate:		□	cfm
Design worst case emissions safety factor:		1.5	

Volume of Displaced Vapor During Tank Filling

HCl usage rate (100%):	□	lbs/day	
HCl solution usage rate (32%):		lbs/day =	□ gal/day
Displaced vapor:		ft^3/day	

.Air Exhaust Scrubber HCl PTE Emission Calculations

Equip ID	Source Description	Total lb.moles vapor @ 85°F (lb.mole/day)	Mole fraction HCl	HCl Emission Rate (lb/day)	Uncontrolled HCl Emissions		Controlled HCl Emissions	
					lb/hr	tpy	lb/hr	tpy
7	28,800-gallon HCl Storage Tank	0.80	0.058	1.7	0.11	0.46	0.0011	0.0046
8	4,200-gallon HCl Dilution Tank	362	0.000014	0.19	0.012	0.052	0.00012	0.00052
Total					0.12	0.52	0.0012	0.0052

. Air Exhaust Scrubber Cl_2 PTE Emission Calculations

Equip ID	Source Description	Uncontrolled Cl_2 Emissions		Controlled Cl_2 Emissions	
		lb/hr	tpy	lb/hr	tpy
7,8,9	Air Exhaust Scrubber	2.6	12	0.0026	0.012

1. Air Construction Permit Application, New Sodium Chlorate Production Plant, Huron Tech Corp., Eastover, South Carolina, dated March 1998
2. AP-42, Chapter 8.11, Chlor-Alkali, Table 8.11-2, USEPA, July 1993; Uncontrolled chlorine emission factor from diaphram cell = 20-100 lb/ton versus caustic scrubber chlorine emission factor = 0.012 lb/ton => 99.94-99.988% control efficiency

Hydrogen Scrubbers

Equipment Specifications[1]:			
Description:		Packed Bed Scrubber	
Pressure Drop:		2-3	in. w.c.
Inlet Temperature:		Ambient	
Outlet Temperature:		□	°F
Inlet Gas Flow Rate:			acfm
Outlet Gas Flow Rate:			acfm
HCl Control efficiency:			%
Cl_2 Control efficiency[2]:		99.9	%
Liquid Injection Rate:		□	gpm
Additive Concentration:			
	NaOH	40	g/L
	$Na_2S_2O_3$	4-5	g/L
Given[1]:			
Sodium chlorate plant production rate:		□	TPD
Maximum plant operating schedule:		24	hours/day
		8,760	hours/year
Actual plant operating schedule:		□	hours/year
lbs HCl/ton $NaClO_3$ @32% sol.:			

Equipment Specifications[1]:		
HCl partial pressure of 32% sol @85°F:	44	mm Hg
HCl partial pressure of 10% sol @85°F:	0.011	mm Hg
Volume of 1 lb.mole @32°F and 1 atm. (760 mm Hg):	359	ft^3
Specific gravity of 32% HCl solution:	1.15	
MW of HCl:	36.46	
Dilute HCl tank vent flow rate:	□	cfm
Typical Cl_2 emission rate @ hydrogen scrubber outlet from previous stack tests at similar Huron plants:	0.012	lb/hr
Estimated Cl_2 emissions from ventilation scrubber versus hydrogen scrubber:	20	%
Typical scrubber outlet flow rate:	□	cfm
Design worst case emissions safety factor:	1.5	

Hydrogen Scrubber Cl_2 PTE Emission Calculations

Equip ID	Source Description	Uncontrolled Cl_2 Emissions		Controlled Cl_2 Emissions	
		lb/hr	tpy	lb/hr	tpy
10	Sodium Chlorate Production Line 10	12	51	0.058	0.26
20	Sodium Chlorate Production Line 20	12	51	0.058	0.26
30	Sodium Chlorate Production Line 30	12	51	0.058	0.26
40	Sodium Chlorate Production Line 40	12	51	0.058	0.26
Total		46	203	0.23	1.02

1. Air Construction Permit Application, New Sodium Chlorate Production Plant, Huron Tech Corp., Eastover, South Carolina, dated March 1998
2. AP-42, Chapter 8.11, Chlor-Alkali, Table 8.11-2, USEPA, July 1993; Uncontrolled chlorine emission factor from diaphram cell = 20-100 lb/ton versus caustic scrubber chlorine emission factor = 0.012 lb/ton => 99.94-99.988% control efficiency

Dryer Scrubber

Equipment Specifications[1]:		
Description:	3 Stage Impingement Scrubbers	
Pressure Drop:	8	in. w.c.
Inlet Temperature:	194	°F
Outlet Temperature:	107	°F
Inlet Gas Flow Rate:	□	acfm
Outlet Gas Flow Rate:		acfm
PM Control Efficiency (AP-42):	99.87	%
PM_{10} Control Efficiency (AP-42):	99.36	%
PM Control Efficiency (Industrial Ventilation)	99.5	%
Liquid Injection Rate:	20	gpm

Given		
Estimated uncontrolled PM emission factor[2]:	218	lb/ton
Estimated wet scrubber controlled PM emission factor[3]:	0.28	lb/ton
Assumed dust concentration for heavily loaded gas streams[4]:	□	gr/scf

Equipment Specifications[1]:

Plant throughput capacity:			ton/day
Air flow rate @194°F (per unit):			cfm
Air flow rate (per unit):			scfm
Estimated Particle Size Distribution[6]:			
	Particle Size, µm	Range, %	Cumm., %
	0-1	0.005	0.005
	1-10	1.995	2
	10-25	58	60
	25-50	36	96
	50-100	4	100
Maximum plant operating schedule:		24	hours/day
		8,760	hours/year
Actual plant operating schedule:		□	hours/year

Dryer Scrubber Particulate Matter PTE Emission Calculations

Equip ID	Source Description	Max PM emissions				**Max PM_{10} Emissions**			
		Uncontrolled		Controlled		Uncontrolled		Controlled	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
23	7.0 ton/hr Fluidized Bed Dryer A and Crystallizer	522	2,288	2.8	12	10	46	0.32	1.39
24	7.0 ton/hr Fluidized Bed Dryer B and Crystallizer	522	2,288	2.8	12	10	46	0.32	1.39
Total		1,045	4,576	5.7	25	21	92	0.63	2.8

. Dryer Scrubber Outlet Particle Size Distribution Analysis

Particle Size (µm)	Inlet (lb/hr)	Fractional Control Efficiency[5] (%)	Emissions (lb/hr)
0-1	0.03	85	0.0039
1-10	10	97	0.31
10-25	303	99.3	2.1
25-50	188	99.8	0.38
50-100	21	99.9	0.021
Total	522	99.5	2.8

Silo Scrubber

Equipment Specifications:			
Description:	3 Stage Impingement Scrubber		
Pressure Drop:	6	in. w.c.	
Inlet Temperature:	□	°F	
Outlet Temperature:		°F	

Equipment Specifications:			
Inlet Gas Flow Rate:		acfm	
Outlet Gas Flow Rate:		acfm	
PM Control Efficiency (Industrial Ventilation)	99	%	
Liquid Injection Rate:	3	gpm	

Given[1]:

Estimated uncontrolled PM emission factor[2]:	0.73	lb/ton
Assumed dust concentration for moderately heavily loaded gas streams[3]:	5	gr/scf
Plant capacity:	261.25	ton/day
Air flow rate @275°F:	735	acfm
Air flow rate:	492	scfm
Estimated Particle Size Distribution[4]:		

Particle Size, µm	Range, %	Cumm., %
0-1	0.01	0.01
1-10	9.99	10
10-25	65	75
25-50	23.5	98.5
50-100	1.5	100

Maximum plant operating schedule:	24	hours/day
	8,760	hours/year
Actual plant operating schedule:	□	hours/year

Silo Dust Scrubber Particulate Matter PTE Emission Calculations

Equip ID	Source Description	Max PM emissions				**Max PM_{10} Emissions**			
		Uncontrolled		Controlled		Uncontrolled		Controlled	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
27	Sodium Chlorate Crystal Pneumatic Conveying Systems and Two Storage Silos	21	92	0.21	0.90	2.1	9.2	0.043	0.19

Silo Scrubber Outlet Particle Size Distribution Analysis

Particle Size (µm)	Inlet (lb/hr)	Fractional Control Efficiency[5] (%)	Emissions (lb/hr)
0-1	0.0021	45	0.0012
1-10	2.1	98	0.042
10-25	14	99	0.14
25-50	5.0	99.5	0.025
50-100	0.32	99.8	0.00063
Total	21	99	0.21

1. Air Construction Permit Application, New Sodium Chlorate Production Plant, Huron Tech Corp., Eastover, South Carolina, dated March 1998

2. AP-42, Chapter 11.12, Concrete Batching, Table 11.12-2, USEPA, June 2006; pneumatic unloading to elevated storage silo
3. Industrial Ventilation Manual
4. Based on logarithmic plot of 100% TSP<100 µm and assumed 10% TSP<10 µm
5. Estimated fractional efficiency for 3-stage impingement scrubber per manufacturer data and engineering judgment

Loading Spout Scrubber

Equipment Specifications[1]:		
Description:	3 Stage Impingement Scrubber	
Pressure Drop:	6	in. w.c.
Inlet Temperature:	ambient	
Outlet Temperature:	90	°F
Inlet Gas Flow Rate:	□	acfm
Outlet Gas Flow Rate:		acfm
PM Control Efficiency (Industrial Ventilation)	99	%
Liquid Injection Rate:	3	gpm

Given[1]:			
Assumed dust concentration for moderately heavily loaded gas streams[2]:		5	gr/scf
Air flow rate @70°F:		□	acfm
Air flow rate:			scfm
Estimated Particle Size Distribution[3]:			
	Particle Size, µm	Range, %	Cumm., %
	0-1	0.01	0.01
	1-10	9.99	10
	10-25	65	75
	25-50	23.5	98.5
	50-100	1.5	100
Maximum plant operating schedule:		24	hours/day
		8,760	hours/year
Actual plant operating schedule:		□	hours/year

Loading Spout Scrubber Particulate Matter PTE Emission Calculations

Equip ID	Source Description	PM Emissions				PM_{10} Emissions			
		Uncontrolled		Controlled		Uncontrolled		Controlled	
		lb/hr	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)	(lb/hr)
W270	Sodium Chlorate Crystal Screw Conveying and Rail Car Loading System	31	134	0.30	1.3	3.1	3.1	13	0.063

Loading Spout Scrubber Outlet Particle Size Distribution Analysis

Particle Size (µm)	Inlet (lb/hr)	Fractional Control Efficiency[4] (%)	Emissions (lb/hr)
0-1	0.0031	45	0.0017
1-10	3.1	98	0.061
10-25	20	99	0.20
25-50	7.2	99.5	0.036
50-100	0.46	99.8	0.00092
Total	31	99	0.30

1. Air Construction Permit Application, New Sodium Chlorate Production Plant, Huron Tech Corp., Eastover, South Carolina, dated March 1998
2. Industrial Ventilation Manual
3. Based on logarithmic plot of 100% TSP<100 µm and assumed 10% TSP<10 µm
4. Estimated fractional efficiency for 3-stage impingement scrubber per manufacturer data and engineering judgment

Fugitives

Equipment Specifications[1]:		
Description:	3 Stage Impingement Scrubber	
Pressure Drop:	6	in. w.c.
Inlet Temperature:	Ambient\	
Outlet Temperature:	90°F	
Inlet Gas Flow Rate:	□	
Outlet Gas Flow Rate:		
PM Control Efficiency (Industrial Ventilation)	99%	
Liquid Injection Rate:	3 gpm	

Given[1]:			
Assumed dust concentration for moderately heavily loaded gas streams[2]:	5 gr/scf		
Air flow rate @70°F:	□		
Air flow rate:			
Estimated Particle Size Distribution[3]:	Particle Size, µm	Range, %	Cumm., %
	0-1	0.01	0.01
	1-10	9.99	10
	10-25	65	75
	25-50	23.5	98.5
	50-100	1.5	100
Maximum plant operating schedule:		24	hours/day
		8,760	hours/year
Actual plant operating schedule:		□	hours/year

. Fugitive Chlorine PTE Emission Calculations - Leaking Equipment

Source	Emission Factor[2] (lb/hr/source)	Max. Leaking Units	Liquor Emissions (lb/hr)	Chlorine Emissions (lb/hr)	Chlorine Emissions (tpy)
Flanges	0.0403	75	3.0	0.012	0.053
Valves	0.0089	4	0.036	0.00014	0.00062
Pump Seals	0.0439	1	0.044	0.00018	0.00077
Total				0.012	0.054

1. Air Construction Permit Application, New Sodium Chlorate
2. Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP, USEPA, November 1995

Emission calculations

Boiler PTE Emissions Equations (per boiler):

HAPs/Hydrogen Chloride – Hydrogen PTE (lbs/hr) – Equations

Step 1. Full Load H_2 Production (lbs/hr)
=Rated production based on □ cells on-line, □kA, □% current efficiency (TPD) x hydrogen production based on 99% current efficiency

Step 2. Maximum Heat Input Rating Firing Hydrogen for Both Boilers (MMBTU/hr)

$$= Full\ Load\ H_2\ Production \left(\frac{lb}{hr}\right) \times Hydrogen\ High\ Heating\ Value \left(\frac{MMBtu}{lb}\right)$$

Step 3. Boiler HCl Emissions at 100% H_2 Use for Both Boilers (lbs/hr)

$$= Boiler\ HCl\ Emission\ Rate \left(\frac{lb}{MMBtu}\right) \times Maximum\ Heat\ Input\ Rating\ Firing\ Hydrogen\ for\ Both\ Boilers \left(\frac{MMBtu}{hr}\right)$$

Step 4. HCl Emissions per Boiler [lbs/hr]
=Boiler HCl at 100% H_2 use for both boiler(lbs/hr)x(design heat input rating per boiler(mmBTU/hr)/(maximum heat input)

Example calculations

Example calculations for the Boiler PTE Emissions:
HAPs/Hydrogen Chloride – Hydrogen PTE (lbs/hr)
Step 1. Full Load H_2 Production

=□ TPD x□ lb/Ton ÷24 hr/day= □lb/hr

Step 2. Maximum Heat Input Rating Firing Hydrogen for Both Boilers (MM BTU/hr)

= □ x □MM Btu/lb =□MMBTU/hr
Step 3. Boiler HCl Emissions at 100% H_2 Use for Both Boilers (lb/hr)

=0.00359 lb/MMBtu x □MM Btu/hr = □ lbs/hr
Step 4. HCl Emissions per Boiler (lb/hr)

-□ lbs/hr x 49.4 MM Btu/hr /□ MM Btu/hr – 0.18 lbs/hr

Air Exhaust Scrubbers

Volume of Displaced Vapor During Tank Filling Equations:

Step 1. HCl Usage Rate (100%) [lbs/day]

$$= \frac{lbs\ HCl}{ton\ NaClO_3}\ @\ 32\%\ sol. \times Sodium\ Chlorate\ Plant\ Production\ Rate\ \left(\frac{tons}{day}\right)$$

Step 2a. HCl Solution Usage Rate (32%) (lbs/day)

$$= \frac{HCl\ Usage\ Rate\ 100\%}{0.32}$$

Step 2b. HCl Solution Usage Rate (32%) (gal/day)

$$= \frac{HCl\ Usage\ Rate\ 32\% \left(\frac{lbs}{day}\right)}{8.34 \frac{lbs}{gal} \times Specific\ Gravity\ of\ 32\%\ HCl\ Solution}$$

Step 3. Displaced Vapor $\left(\frac{ft^3}{day}\right)$

$$= \frac{HCl\ Usage\ Rate\ (32\%) \left(\frac{gal}{day}\right)}{7.481 \frac{gal}{ft^3}}$$

Please see in the confidential version of this SOB the Example Calculations for the Volume of Displaced Vapor During Tank from Filling operations.

Air Exhaust Scrubber HCl PTE Emissions Equations:

Step 1. Total lb.moles vapor @85 ^{0}F (lb.mole/day) – Equipment 7

$$= \frac{Displaced\ Vapor\ \left(\frac{ft^3}{day}\right)}{Volume\ of\ 1\ lb.mole\ @\ 32°F\ and\ 1\ atm\ \left(\frac{ft^3}{lb.mole}.\right) \times \frac{(460+85)}{(460+32)}}$$

Step 1. Total lb.moles vapor @85 ^{0}F (lb.mole/day) – Equipment 8

=Dilute HCl Tank vent flow rate[cfm]x 60min/hr x (max.plant operating schedule[hrs/day])/volumeof 1lb.mole @320Fand 1 atm(ft)

Step 2. Mole Fraction HCl – Equipment 7

$$= \frac{HCl\ Partial\ Pressure\ of\ 32\%\ sol\ @\ 85°F\ (mm\ Hg)}{760\ mm\ Hg}$$

Step 2. Mole Fraction HCl – Equipment 8

$$= \frac{HCl\ Partial\ Pressure\ of\ 10\%\ sol\ @\ 85°F\ (mm\ Hg)}{760\ mm\ Hg}$$

Step 3. HCl Emission Rate (lbs/day) – Same equation for Equipment 7 and Equipment 8

$$= Total\ lb.moles\ vapor\ @85°F\ \left(\frac{lb.mole}{day}\right) \times Mole\ Fraction\ HCl\ \times MW\ of\ HCl$$

Step 4. Uncontrolled HCl Emissions (lb/hr) – Same equation for Equipment 7 and Equipment 8

$$= \frac{HCl\ Emission\ Rate\ \left(\frac{lb}{day}\right)}{Maximum\ Plant\ Operating\ Schedule\ \left(\frac{hr}{day}\right)} \times Design\ Worst\ Case\ Emission\ Safety\ Factor$$

Step 5. Controlled HCl Emissions (lb/hr) – Same equation for Equipment 7 and Equipment 8

$$= Uncontrolled\ HCl\ Emissions\ \left(\frac{lb}{hr}\right) \times (1 - HCl\ Control\ Efficiency\ \%)$$

Please see the Air Exhaust Scrubber HCl PTE Emissions Example Calculation presented in the confidential version of this SOB**.**

Hydrogen Scrubbers

Hydrogen Scrubber Cl_2 PTE Emission Equations:

Step 1. Uncontrolled Cl_2 Emissions (lb/hr)
=(typical Cl2 emission rate @ hydrogen scrubber outlet from previous stack test at similar Huron Plants(lb/hr) x inlet gas flow rate (acfm)

Step 2. Controlled Cl_2 Emissions (lb/hr)

$$= \frac{HCl\ Emission\ Rate\ to\ both\ Boilers\ \left(\frac{lb}{hr}\right)}{Number\ of\ Hydrogen\ Scrubbers} \times \left(\frac{MW\ of\ Cl}{MW\ of\ HCl}\right) - Typical\ ClO_2\ Emission\ Rate\ @\ Hydrogen\ Scrubb$$

Please see the Example Calculations for the Hydrogen Scrubber Cl_2 PTE Emissions (Example shown for Equipment ID 10 – Sodium Chlorate Production Line 10; the same calculations would apply to Equipment IDs 20, 30, and 40 – Sodium Production Lines 20, 30, and 40): These calculations are presented in the confidential version of this SOB.

Dryer Scrubbers

Dryer Scrubber Particulate Matter PTE Emission Calculations (Industrial Ventilation Method):

Step 1. Uncontrolled PM Emissions (lb/hr)

$$= \frac{Assumed\ Dust\ Conc.\ for\ Heavily\ Loaded\ Gas\ Streams\ \left(\frac{gr}{scf}\right) \times Air\ flow\ Rate\ (per\ unit)(scfm) \times 60\frac{min}{hr}}{7000\frac{grains}{lb}}$$

Step 2. Uncontrolled PM_{10} Emissions (lb/hr)

$$= Uncontrolled\ PM\ Emissions\ \left(\frac{lb}{hr}\right) \times\ Cumm.\%$$

Step 3. Controlled PM Emissions (lb/hr)

$$= Sum\ of\ each\ Particle\ Size\ Range\ (0 - 1\ \mu m, 1 - 10\ \mu m, 10 - 25\ \mu m, 25 - 50\ \mu m, 50 - 100\ \mu m)\ Emissons\ \left(\frac{lb}{hr}\right)$$

Step 4. Controlled PM_{10} Emissions (lb/hr)

$$Controlled\ PM_{10} Emissions\ \left(\frac{lb}{hr}\right) = (Emissions\ for\ Particle\ Size\ 0 - 1\ \mu m) + (Emissions\ for\ Particle\ Size\ 1 - 10\ \mu m)$$

Please see the the . Example Calculations for the Dryer Scrubber Particulate Matter PTE Emissions (Industrial Ventilation Method) in the confidential version of these SOB; The shown wxample represents Equipment ID 23-7 ton/hr Fluidized Bed Dryer A and Crystalizers. The same methodologies would apply to Equipment IDs 24, 27, and W270/

Dryer Scrubber Outlet Particle Size Distribution Analysis Equations):

Step 1. Inlet Rates (lbs/hr)

$$= Total\ Inlet\ \left(\frac{lb}{hr}\right) \times Range\ \%$$

Step 2. Emissions by Particle Size (lbs/hr)

$$= Inlet\ \left(\frac{lb}{hr}\right) \times (1 - Fractional\ Controll\ Efficiency\ \%)$$

Example Calculations for the Dryer Scrubber Outlet Particle Size Distribution Analysis:

Step 1. Inlet (lb/hr)

$$Inlet\ for\ 0-1\ \mu m\ = 522\frac{lb}{hr} \times\ 0.005\% \ = 0.03\frac{lb}{hr}$$

*Note the same calculation is done for each particle size range

Step 2. Particle Size Emissions (lb/hr)

$$Particle\ Size\ Emissions\ for\ 0-1\ \mu m\ = 0.03\frac{lb}{hr} \times (1-85\%)\ = 0.0039\frac{lb}{hr}$$

**Note the same calculation is done for each particle size range;*

Table 1A. Plant Emissions Summary - Uncontrolled Emissions (lb/hr)

Unit ID	Equipment ID	Stack ID	HCl	CL_2	PM	PM_{10}	$PM_{2.5}$[1]	SO_2	NO_x	VOC	CO	CO_2e
01	32	Boiler A	0.18	--	1.2	0.81	0.55	2.5	7.4	0.071	1.8	8,082
02	33	Boiler B	0.18	--	1.2	0.81	0.55	2.5	7.4	0.071	1.8	8,082
03	5 7 8	9	0.12	2.6	--	--	--	--	--	--	--	--
	10	11	--	12	--	--	--	--	--	--	--	--
	20	12	--	12	--	--	--	--	--	--	--	--
	30	13	--	12	--	--	--	--	--	--	--	--
	40	14	--	12	--	--	--	--	--	--	--	--
	23	25	--	--	522	10	10	--	--	--	--	--
	24	26	--	--	522	10	10	--	--	--	--	--
	27	28	--	--	21	2.1	2	--	--	--	--	--
	W270	29	--	--	31	3.1	3	--	--	--	--	--
fugitives	N/A		--	0.012	--	--	--	--	--	--	--	--
Total (lb/hr)			0.47	49	1,09	28	27	5.0	15	0.14	3.5	16,16

Table 1B. Plant Emissions Summary - Uncontrolled Emissions (tpy)

Unit ID	Equipment ID	Stack ID	HCl	CL_2	PM	PM_{10}	$PM_{2.5}$[1]	SO_2	NO_x	VOC	CO	CO_2e
01	32	Boiler A	0.78	--	5	3.6	2.4	11	32	0.31	8	35,39
02	33	Boiler B	0.78	--	5	3.6	2.4	11	32	0.31	8	35,99

Unit ID	Equipment ID	Stack ID	HCl	CL_2	PM	PM_{10}	$PM_{2.5}$[1]	SO_2	NO_x	VOC	CO	CO_2e
03	5 7 8	9	0.52	12	--	--	--	--	--	--	--	--
	10	11	--	51	--	--	--	--	--	--	--	--
	20	12	--	51	--	--	--	--	--	--	--	--
	30	13	--	51	--	--	--	--	--	--	--	--
	40	14	--	51	--	--	--	--	--	--	--	--
	23	25	--	--	2,288	46	46	--	--	--	--	--
	24	26	--	--	2,288	46	46	--	--	--	--	--
	27	28	--	--	92	9.2	9.2	--	--	--	--	--
	W270	29	--	--	134	13	13	--	--	--	--	--
fugitives	N/A		--	0.054	--	--	--	--	--	--	--	--
Total (lb/hr)			2.1	215	4,812	121	119	22	65	0.62	15	70,79

Table 1C. Plant Emissions Summary - controlled Emissions (lb/hr)

Unit ID	Equipment ID	Stack ID	HCl	CL_2	PM	PM_{10}	$PM_{2.5}$[1]	SO_2	NO_x	VOC	CO	CO_2e
01	32	Boiler A	0.18	--	1.2	0.81	0.55	2.5	7.4	0.071	1.8	8,082
02	33	Boiler B	0.18	--	1.2	0.81	0.55	2.5	7.4	0.071	1.8	8,082
03	5 7 8	9	0.0012	0.0026	--	--	--	--	--	--	--	--
	10	11	--	0.058	--	--	--	--	--	--	--	--
	20	12	--	0.058	--	--	--	--	--	--	--	--
	30	13	--	0.058	--	--	--	--	--	--	--	--
	40	14	--	0.058	--	--	--	--	--	--	--	--
	23	25	--	--	2.8	0.32	0.32	--	--	--	--	--
	24	26	--	--	2.8	0.32	0.32	--	--	--	--	--
	27	28	--	--	0.21	0.043	0.043	--	--	--	--	--
	W270	29	--	--	0.30	0.063	0.063	--	--	--	--	--
fugitives	N/A		--	0.012	--	--	--	--	--	--	--	--
Total (lb/hr)			0.36	0.25	8.5	2.4	1.8	5.0	15	0.14	3.5	16,16

Table 1D. Plant Emissions Summary - controlled Emissions (tpy)

Unit ID	Equipment ID	Stack ID	HCl	CL_2	PM	PM_{10}	$PM_{2.5}$[1]	SO_2	NO_x	VOC	CO	CO_2e
01	32	Boiler A	0.78	--	5	3.6	2.4	11	32	0.31	8	35,39
02	33	Boiler B	0.78	--	5	3.6	2.4	11	32	0.31	8	35,39
03	5 7 8	9	0.005	0.012	--	--	--	--	--	--	--	--
	10	11	--	0.26	--	--	--	--	--	--	--	--
	20	12	--	0.26	--	--	--	--	--	--	--	--
	30	13	--	0.26	--	--	--	--	--	--	--	--
	40	14	--	0.26	--	--	--	--	--	--	--	--
	23	25	--	--	12	1.4	1.4	--	--	--	--	--
	24	26	--	--	12	1.4	1.4	--	--	--	--	--
	27	28	--	--	0.90	0.19	0.19	--	--	--	--	--
	W270	29	--	--	1.3	0.28	0.28	--	--	--	--	--
fugitives	N/A		--	0.054	--	--	--	--	--	--	--	--
Total (lb/hr)			1.6	1.1	37	10	8.0	22	65	0.62	15	70,79

EMISSIONS

FACILITY WIDE EMISSIONS		
Pollutant	**Uncontrolled Emissions**	**Controlled Emissions**
	TPY	**TPY**
Total Emissions for 1900-0172		
HCl	2.04	1.6
Cl_2	215	1.1
PM	4,812	37
PM_{10}	121	10
PM2.5	119	8
SO_2	22	22
NOx	65	65
CO	15	15
VOC	0.62	0.62
CO2e	70,807	70,807
Emissions from facility 1900-0206		
HCl	195	5
VOC	15	15
CO2e	8.9	8.9
Total for the two facilities		
HCl	197.04	6.6
VOC	15.62	15.62
CO_2e	70,815.9	70,815.9

OPERATING PERMIT STATUS

This source is also collocated with another Finnchem facility in Eastover (Permit No. CM-1900-0206) that has potential uncontrolled HCl emissions above the Title V threshold applicability limit. To avoid being a major source for Title V and PSD applicability, these facilities have Federally enforceable operating limitations of less than 25 tons of total HAPs, less than 10 tons of a single HAP, and less than 100 tons per year of PM, PM_{10}, and $PM_{2.5}$. This source will have a Conditional Major status for the criteria pollutants, and will be an area source for HAPs.

REGULATORY APPLICABILITY REVIEW

Regulation	Comments/Periodic Monitoring Requirements
Section II.E - Synthetic Minor	This is an operating permit with synthetic minor limits (Please see the discussion above).
Standard No. 1	The facility has two existing boilers, 49.4 Million Btu/hr each. Both boilers were installed in 1998. Each boiler is subject to a 20% opacity limit, 0.6 lb/Million Btu PM, and 3.5 lb/Million Btu of SO_2.
Standard No. 3 (state only)	FinnChem is subject to this Standard because it uses the process by-product hydrogen gas as the primary fuel for the two boilers. Upon combustion, the remaining chlorine in the hydrogen gas converts to HCl, resulting in HCl emissions from the boilers. Hydrochloric Acid (HCl) emissions from this source shall not exceed 0.45 lb/Million Btu total heat input
Standard No. 4	Std. 4 is applicable to the Sodium Chlorate Production Process, Storage and Conveying (Unit ID 03). The opacity is limited to 20% and the unit's allowable particulate matter emission rate is 24.0 lb/hr at its nominal production rating of 14 tons/hour. The PM emissions from this unit are controlled by Three-Stage Impingement Dust Scrubbers with established operational ranges.on the pressure drop gauges. The pressure drop readings are recorded each shift during sources operation. The controlled PM emissions are 6 lb/hr, below the allowable PM rates.
Standard No. 5	N/A-The facility was not in existence in 1979 or 1980.
Standard No. 5.1 (state only)	N/A- This facility is collocated with the other FinnChem facility (1900-0206). These facilities do not have the PTE of 100 TPY of VOCs. The baseline for both facilities is 0 TPY. PTE for: this facility (1900-0172): 0.66 tpy; other facility (1900-0206): 15.27 tpy=~16tpy.
Standard No. 5.2	The boilers for this facility were permitted to construct before 6/25/2004 and the burner assembly has not been replaced in either boiler.
Standard No. 7	This facility is a chemical processing plant that has potential uncontrolled PM, PM_{10}, and $PM_{2.5}$, emissions above the 100 TPY applicability thresholds (it belongs to the category of stationary sources that are classified as major with a 100 tpy threshold of any regulated NSR pollutant) , however with control devices, the potential to emit of those pollutants fall below the applicability threshold so the facility is not considered to be a "major" source as defined under the PSD regulations.
61-62.6	The fugitive PM emissions are controlled in such a manner that should not produce undesirable levels.
40 CFR 60 and 61-62.60	The boilers are subject to subparts A and Dc. Records of the amounts of fuel combusted each day, sulfur content, and submittal of fuel oil certification satisfy the requirements of this Subpart. COMs are required for boilers that combust coal, residual oil or wood. This facility combusts off-process hydrogen as a primary fuel and #2(distillate) fuel oil as back up. As a result, no COMs are required for these boilers. The 30,000 gallon No. 2 fuel oil storage tank is no longer subject to Kb because it has a capacity between 75 cubic meters- 150 cubic meters and has a vapor pressure < 15 kPA.
40 CFR 61 and 61-62.61	The facility is not subject to any Part 61 requirements.

Regulation	Comments/Periodic Monitoring Requirements
40 CFR 63 and 61-62.63	The facility operates two 49.4 million British Thermal Units per hour (MMBtu/hr) boilers that are permitted to burn No. 2 fuel oil and hydrogen. The facility is subject to Title 40 CFR Part 63, Subpart JJJJJ, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources since the facility is an area source for Hazardous Air Pollutants that operates boilers. The boilers are classified as existing oil fuel boilers. Requirements for this category of boiler include performing a tune-up by March 21, 2014, and biennially thereafter, and conducting a one-time energy assessment by March 21, 2014. In addition, the facility is subject to a few recordkeeping and reporting requirements including submitting an initial notification of applicability for this subpart by January 20, 2014. In addition, the facility operates a 235-horsepower (hp) four-stroke spark ignition (SI) engine that is used to operate a fire water pump in the event of an emergency. As such, the facility is subject to 40 CFR Part 63, Subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE). The engine is classified as an existing emergency SI RICE. Requirements for this category of RICE include work practice standards, restrictions on the number of hours the engine is allowed to run in a non-emergency capacity, and the requirement to install a non-resettable hour meter. The initial compliance date for this subpart is October 19, 2013. The facility is not subject to Subpart VVVVVV because it does not use feedstocks, generate as byproducts, or produces as products any of the 15 chemical manufacturing organic urban HAPs or metal HAPs listed in Table 1 of this subpart. The standards of this subpart do not apply to hydrogen halides at affected sources except when these HAPs are generated in combustion-based emission control devices that are used to meet the proposed standards. The source emits HCl and chlorine, but it is neither an affected source, as stated above, nor does it have any combustion based control device.
61-62.68	This process does not store or use chemicals subject to 112(r) above threshold quantities.
40 CFR 64	This facility is not a TV source.

MODELING REVIEW

Regulation	Comments/Periodic Monitoring Requirements
Standard No. 2	This facility demonstrated compliance through modeling for the Ambient Air Quality Standards; see modeling summary dated 08/15/2013.
Standard No. 7.c	This facility has potential uncontrolled PM, PM_{10} and SO_2 emissions above the 100 TPY applicability thresholds, however with sulfur content limitation and control devices, the potential to emit of those pollutants fall below the applicability threshold so the facility is not considered to be a "major" source as defined under the PSD regulations. The facility has taken limits to stay below the TV source thresholds for PM_{10} and SO_2.
Standard No. 8 (state only)	This facility demonstrated compliance through modeling for the Ambient Air Quality Standards; see modeling summary dated 08/15/2013.
Standard No. 7.c: Ambient Air Increments	This facility has demonstrated compliance through modeling; see modeling summary dated 08/15/2013

PUBLIC NOTICE

This Conditional Major Permit will undergo a 30-day public notice period in accordance with SC Regulation 61-62.1, Section II (N). This permit was placed in *The State* newspaper on August 30, 2013. The comment period was open from August 30, 2013 to September 28, 2013 and was placed on the BAQ website during that time period. Comments were received during the comment period. They have been addressed in the Response to Comments.

ADDITIONAL PUBLIC PARTICIPATION N/A

SUMMARY AND CONCLUSIONS

It has been determined that this source, if operated in accordance with the submitted application, will meet all applicable requirements and emission standards.

Company Name:	FinnChem USA Inc.	**Permit Writer:**	Snezana Popova
Permit Number:	CM-1900-0206	**Date:**	11-05-2013

DATE APPLICATION RECEIVED: March 13, 2013, revisions through June 20, 2013. (Modeling was completed on August 15, 2013)

FACILITY DESCRIPTION Two separate processes are at this facility. They are: 1) Coating and Curing and 2) Acid Etching.

Catalytic Coatings: applied to anodes and cured in an iterative batch process. Each batch of 1,042 anodes requires multiple coats, applied at a maximum rate of 5 coats per day. Each iteration of the coating process will require one hour for coating application and one hour for curing, followed by a 14-hour post bake. The coating is a mixture of two primary compounds: ruthenium trichloride trihydrate and titanium n-butoxide, along with small amounts of butyl alcohol, hydrochloric acid and water. The titanium n-butoxide contains a small amount (no more than 3%) of free n-butanol. During the coating process, the free n-butanol (butyl alcohol) may be lost as VOC emissions.

The curing process is preformed in one of two electric ovens. In this process, the ruthenium trichloride trihydrate and the titanium n-butoxide decompose in the heat leaving ruthenium oxide and titanium oxide on the anodes, and yielding gaseous emissions including VOCs, and hydrochloric acid (HCl). The hydrochloric acid in the coating solution as applied is also assumed to be emitted.

Metal Etching:performed to prepare metal parts for use in FinnChem's sodium chlorate production process. Parts are etched using a (maximum 38%) HCl solution. Based on experience at other facilities, maximum HCl usage will be one-half of a 55-gallon drum of HCl solution per day. It is conservatively assumed that all the HCl is exhausted from the etch tank as an acid aerosol. The HCl will be exhausted to a caustic scrubber, with expected emissions reduction of at least 99%.

Other Operations/Processes: Analytical Labs and Research and Development will have a total of 8 laboratory fume hoods which are considered exempt from permitting. Cleaning activities to include clean-up after coating operations, cleaning of some metal parts in preparation for welding, and for assembly of PVC piping. Materials used are denatured alcohol, Lax Cleaner, and PVC solvent cement and primer. Total amount of usage of all of these materials combined will be less than 1,000 pounds. The fugitive air pollutant emissions from these activities will include VOCs and very small amounts of methanol, methyl isobutyl ketone, methyl ethyl ketone, and xylene. VOC emissions will be substantially less than 1000 lbs/yr of material purchases.

Following are the exempted sources at this facility.

Equip ID	Source Description (Date Listed)	Exemption Basis
UAT	470 gallon Used Acid Tank (October 29, 2002)	S.C. Regulation 61-62.1 (B)(2)(h)
NT	500 gallon Neutralization Tank (October 29, 2002)	S.C. Regulation 61-62.1 (B)(2)(h)
WHT	4,000 gallon Waste Holding Tank (October 29, 2002)	S.C. Regulation 61-62.1 (B)(2)(h)
RT	Two-compartment (100 gallons each) rinse tank)	S.C. Regulation 61-62.1 (B)(2)(h)
ST	Two-three compartment (175 gallons each) soak tanks	S.C. Regulation 61-62.1 (B)(2)(h)
DIT	1400 gallon Deionized water storage tank	S.C. Regulation 61-62.1 (B)(2)(h)

PROJECT DESCRIPTION
The facility has requested to have their Conditional Major Operating permit renewed.

COLLOCATION DETERMINATION
Finnchem operates two facilities that are located on nearby properties in Eastover, South Carolina: a sodium chlorate manufacturing facility (Permit No. CM-1900-0172) and the anode manufacturing facility (Permit No. CM-1900-0206). These facilities meet the "major source" definition set forth in Title 40 of the Code of Federal Regulations (CFR) Part 70.2 defining as major "any stationary source (or any group of stationary sources that are located on one or more contiguous or adjacent properties, and are under common control of the same person (or persons under common control)) belonging to a single major industrial grouping" based on the following:

-The two abovementioned Finnchem facilities are located approximately 90 feet apart and are separated by Wateree Road and a right-of-way for a future rail spur, which is owned by SCE&G.
-Both the anode manufacturing facility and the sodium chlorate manufacturing facility are owned by Finnchem.

-The operations for both the anode manufacturing facility and the sodium chlorate manufacturing facility are described by SIC code 2819 (Industrial Inorganic Chemicals).

Therefore, for Title V and Title III (HAPs) permitting purposes, the two facilities are considered collocated and emissions from both facilities must be considered with respect to Title V permitting thresholds even though each facility maintains a separate air permit.

CHANGES SINCE LAST OP ISSUANCE

Following is a description of the changes in this renewal application with respect to the 2008 permit renewal application for CM-1900-0206.

–Coating: Updated the number of batches per day to match the existing permit limit of 17.6 lbs/day of hydrochloric acid;

-Metal Etching: Updated the acid solution usage rate to match the existing permit limit of three 55-gallon drums per day;

-Metal Etching: Updated the percent HCl in acid solution from 38% to 31.5%;

A SCREEN 3 modeling analysis was completed for HCl and CO. PM10, and PM2.5 were less than 1.0 lb/hr and are exempt from the dispersion modeling. The facility used the method used in the original 1998 permit application for the plant to estimate the NOx emissions from the boilers, since there have been no changes to the boilers since 1998 and showed that there are no increases in NOx emissions since the last version of modeling was performed.

The facility indicated on August 16, 2013 that they accept the clarification on the changes in the permit, regarding the August 14, 2013 comments from the facility, as follows:
1.The exemption list and the general information page are no longer included in the current permit template; and,
2. The HAP emissions will have to be calculated on a monthly basis.

SPECIAL CONDITIONS, MONITORING, LIMITS
-Facility-wide- In accordance with South Carolina Regulation 61-62.1, Sec II(G), the facility has agreed to federally enforceable operating limits to limit potential to emit to less than 10 tons per year for each individual hazardous air pollutant and 25 tons per year for the total hazardous air pollutants. The owner/operator shall maintain consumption records of all process-related materials containing hazardous air pollutants (HAP) and calculate the yearly totals as a twelve month rolling sum. To comply with this limit,the owner/operator shall also continue to operate, and maintain pressure drop indicators and ph meters on each scrubber module (Equip ID 32).

-ID 02- The Anode Coating process is limited on use of raw material containing Hydrochloric Acid (HCl) and HCl precursor Ruthenium trichloride ($RuCl_3xH_2O$) to an amount not to exceed 17.6 pounds per day as HCl in order to comply with SC Regulation 61-62.5, Standard No. 8. The owner/operator must record the daily actual usage of raw materials containing Hydrochloric Acid (HCl) and HCl precursor Ruthenium trichloride ($RuCl_3xH_2O$) daily.

-ID 03- The Metal Etching process is limited to the used of three (3) 55-gallon drums of acid solution per day in order to maintain HCl emissions below 6.3 lb/day HCl in order to comply with SC Regulation 61-62.5, Standard No. 8. The owner/operator must record the number of gallons of acid solution used daily.

-PM, PM_{10}, and $PM_{2.5}$ limits will be in 1900-0172 only, as the co-located facility emits these pollutants and this facility 1900-0206 does not.

EMISSIONS (Please see the Confidential information of this SOB for details)

Coating Process:
Chemical Reactions:
Rxn1. RuCl3·3H2O + Ti(C4H9O)4 + 4.25 O2 + heat -> RuO2 + TiO2 + 0.5 H2O + 4 CO2 + 3 HCl+ 2 C4H10 + 2 C2H6
Rxn2. Ti(C4H9O)4 + O2 + heat -> TiO2 + 2 CO2 + 2 C4H10 + 2 C3H8
Coating application rate for RuCl3·3H2O =□lb-moles/day

VOC Emissions from Coating (reactants)

Compound Name	Formula	Maximum usage per batch[1] (grams)	Maximum daily usage[1] (grams)	MW (g/mol)
Ruthenium trichloride trihydrate	$RuCl_3 \cdot 3H_2O$	□		261.46
Titanium n-butoxide	$Ti(C_4H_9O)_4$			340.36
Butanol	$C_4H_{10}O$			74.12
Hydrochloric acid (100%)	HCl			36.46
Water	H_2O			18.02

VOC Emissions from Coating (reactants)-cont.

Compound Name	Normalized Molar Ratio (as purchased)	Molar Ratio (Corrected for 3%w/w butanol in titanium butoxide[1])	Emissions		
			lb/day	lb/hr[2]	tpy[3]
Ruthenium trichloride trihydrate	□		--	--	--
Titanium n-butoxide			Butanol fraction incorporated in next row		
Butanol			6.6	0.42	1.9
Hydrochloric acid (100%)			Included in Table below		
Water			--	--	--

Emissions from Baking (products)

Compound Name	Moles (Rxn1)	Moles (Rxn2)	MW (g/mol)	Mole per mole of $RuCl_3$	Emissions		
					lb/day	lb/hr[2]	tpy[3]
Hydrochloric acid	□		36.46	□	18	1.1	5.0
Butane			58.12		29	1.9	8.1
Propane			44.10		12	0.77	3.4
Ethane			30.07		6.7	0.43	1.9
Carbon dioxide			44.01		32	2.0	8.9

1. Maximum usage per batch based on permit limit of 17.6 pounds per day of HCl
2. Based on number of batches per day and time per batch
3. Based on number of batches per day

VOC Emissions from Coating (reactants) Equations and Example Calculations:

Step 1. Maximum daily usage (g/day) = Maximum usage per batch (grams) X Batches per day

$RuCl_3 \cdot 3H_2O$: □* 15.55/day = 13,311 g/day

Step 2. Moles per Day (mol/day) = Maximum daily usage (g/day) / Molecular Weight (g/mol)

$RuCl_3 \cdot 3H_2O$: □/ 261.26 g/mol = 51 mol/day

Step 3. Normalized Molar Ratio (as purchased) = Moles per day of a given compound / Moles per day of $RuCl_3 \cdot 3H_2O$
For $RuCl_3 \cdot 3H_2O$: □/ 49 mol/day = 1
Step 4. Molar Ratio corrected for 3% Butanol in Titanium n-butoxide ($Ti(C_4H_9O)_4$)
Equation 1 for Titanium n-butoxide is Normalized Molar Ratio X (1-3%) = □*(1-3/100)) = 2.2

Equation 2 for Butanol is 3% of Maximum daily usage of $Ti(C_4H_9O)_4$ (g/day) / (Molecular Weight of Butanol (g/mol) X Moles Per Day of $RuCl_3 \cdot 3H_2O$) + Normalized Ratio of Butanol; please see the confidential version of this Statement of basis.

Step 5. Emissions for Butanol (lb/day) = Coating application rate for $RuCl_3 \cdot 3H_2O$ (lb-moles/day) X Molecular Weight (g/mol) X Corrected Molar Ratio

=□ lb-moles/day x 74.12 g/mo; x □ = 6.6 lbs/day

Step 6. Emissions for Butanol (lb/hr) = Pounds per day Emissions (lbs/day) / (Batches per day X Time per Batch)
= (6.6 lbs/day/(15.55 batches/day*1 hour/batch)= 0.42lbs/hr

Emissions from Baking (products) Equations and Example Calculations:
Step 1. Moles (Rxn1) are the number of moles in Reaction One, and Moles (Rxn2) are the number of moles in Reaction Two.

Rxn1. $RuCl_3 \cdot 3H_2O + Ti(C_4H_9O)_4 + 4.25\ O_2$ + heat -> $RuO_2 + TiO_2 + 0.5\ H_2O + 4\ CO_2 + 3\ HCl + 2\ C_4H_{10} + 2\ C_2H_6$
Rxn2. $Ti(C_4H_9O)_4 + O_2$ + heat -> $TiO_2 + 2\ CO_2 + 2\ C_4H_{10} + 2\ C_3H_8$

Step 2. Moles per mole of $RuCl_3 \cdot 3H_2O$

For HCl - Moles from Rxn1 + Moles from Rxn2 + Normalized Molar Ratio of HCl (Table 18) = Mole per pole of $RuCl_3 \cdot 3H2O$ □

For Butane - Moles from Rxn1 of Butane X Moles used in Rxn1 of $Ti(C_4H_9O)_4$ + Moles from Rxn2 of Butane X Moles used in Rxn2 of $Ti(C_4H_9O)_4$ = □For Propane - Moles from Rxn1 of Propane X Moles used in Rxn1 of $Ti(C_4H_9O)_4$ + Moles from Rxn2 of Propane X Moles used in Rxn2 of $Ti(C_4H_9O)_4$ = □

For Ethane - Moles from Rxn1 of Ethane X Moles used in Rxn1 of $Ti(C_4H_9O)_4$ + Moles from Rxn2 of Ethane X Moles used in Rxn2 of $Ti(C_4H_9O)_4$ = □

For CO_2 - Moles from Rxn1 of CO_2 X Moles used in Rxn1 of $Ti(C_4H_9O)_4$ + Moles from Rxn2 of CO_2 X Moles used in Rxn2 of $Ti(C_4H_9O)_4$ = □Step 3. Emissions (lbs/day) = Coating application rate for $RuCl_3 \cdot 3H_2O$ (lb-moles/day) X Molecular Weight (g/mol) X Mole per mole of $RuCl_3 \cdot 3H_2O$

For HCl=□ lb-moles/day x 36.4 g/mol x □ =17.6 lbs/day

Step 4. Emissions (lbs/hr) = Pounds per day emissions / (Batches per day X Time per Batch)
For HCl = (17.6 lbs/day/(15 batches/day * 1 hour/batch)= 1.1lbs/hr

Metal Etching

Maximum Operating Schedule: 24 hours/day, 365 days/year
Acid solution usage rate: 165 gal/day
Percent HCl in acid solution: 31.5%
SG of acid solution1: 1.2
Density of acid solution: 10 lb/gal

Potential Emissions from Metal Etching Process Equations:
Step 1. Uncontrolled Emissions (lb/hr)

$$= \frac{Acid\ Solution\ Usage\ Rate\ \left(\frac{gal}{day}\right) \times Density\ of\ Acid\ Solution\ \left(\frac{lb}{gal}\right) \times Percent\ HCl\ in\ acid\ solution\ (\%)}{Actual\ Operating\ Schedule\ \left(\frac{hrs}{day}\right)}$$

Example Calculations for the Potential HCl Emissions from Metal Etching Process:

Step 1. Uncontrolled Emissions $\left(\frac{lb}{hr}\right)$

$$= \frac{165\,\frac{gal}{day} \times 10\,\frac{lb}{gal} \times 31.5\%}{12\,\frac{hrs}{day}} = 43.3\,\frac{lb}{hr}$$

Potential Emissions from Metal Etching Process

Pollutant	Uncontrolled Emissions			Controlled Emissions		
	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy
HCl - calculated	43	1,040	190	--	--	--
HCl - stack test[2]	--	--	--	0.0015	0.036	0.0066

1. Air Construction Permit Application, Finnchem USA Inc., TRC Triangle, Inc., February 11, 2002
2. Stack test for Scrubber Exhaust, June 12, 2003

Facility-wide emissions (by emission unit)

Equip ID	Equip ID	Stack ID	Source Description	Control Device	Uncontrolled Emissions, lb/hr						
					HCl	Butyl alchohol	Ethane	Propane	Butane	VOC[1]	CO_2e
02	27	127	Anode Coating Application[2]	N/A	0.02	0.42	--	--	--	0.42	--
	28	128, 129	Electric Curing Oven, 500,000 Btu/hr	N/A	1.1	--	0.43	0.77	1.9	3.1	2.0
	29	N/A	Electric Curing Oven, 160,000 Btu/hr	N/A							
03	31	132	Etch Tank	Caustic Scrubber (32)	43	--	--	--	--	--	--
Total (tpy)					44	0.42	0.43	0.77	1.9	3.5	2.0

Equip ID	Equip ID	Stack ID	Source Description	C/D	Uncontrolled Emissions, tpy						
					HCl	Butyl alchohol	Ethane	Propane	Butane	VOC[1]	CO_2e
02	27	127	Anode Coating Application[2]	N/A	0.10	1.9	--	--	--	1.9	--
	28	128, 129	Electric Curing Oven, 500,000 Btu/hr	N/A	4.9	--	1.9	3.4	8.1	13	8.9
	29	N/A	Electric Curing Oven, 160,000 Btu/hr	N/A							
03	31	132	Etch Tank	Caustic Scrub	190	--	--	--	--	--	--

Equip ID	Equip ID	Stack ID	Source Description	C/D	Uncontrolled Emissions, tpy						
					HCl	Butyl alchohol	Ethane	Propane	Butane	VOC[1]	CO_2e
				ber (32)							
Total (tpy)					195	1.9	1.9	3.4	8.1	15	8.9

Equip ID	Equip ID	Stack ID	Source Description	Control Device	Controlled Emissions, lb/hr						
					HCl	Butyl alchohol	Ethane	Propane	Butane	VOC[1]	CO_2e
02	27	127	Anode Coating Application[2]	N/A	0.02	0.42	--	--	--	0.42	--
	28	128, 129	Electric Curing Oven, 500,000 Btu/hr	N/A	1.1	--	0.43	0.77	1.9	3.1	2.0
	29	N/A	Electric Curing Oven, 160,000 Btu/hr	N/A							
03	31	132	Etch Tank	Caustic Scrubber (32)	0.0015	--	--	--	--	--	--
Total (tpy)					1.1	0.42	0.43	0.77	1.9	3.5	2.04

Equip ID	Equip ID	Stack ID	Source Description	Control Device	Controlled Emissions, tpy						
					HCl	Butyl alchohol	Ethane	Propane	Butane	VOC[1]	CO_2e
02	27	127	Anode Coating Application[2]	N/A	0.10	1.9	--	--	--	1.9	--
	28	128, 129	Electric Curing Oven, 500,000 Btu/hr	N/A	4.9	--	1.9	3.4	8.1	13	8.9
	29	N/A	Electric Curing Oven, 160,000 Btu/hr								
03	31	132	Etch Tank	Caustic Scrubber (32)	0.0066	--	--	--	--	--	--
Total (tpy)					5.0	1.9	1.9	3.4	8.1	15	8.9

1. Conservatively includes ethane emissions to be consistent with the original Air Construction Permit Application (TRC Triangle, Inc., February 11, 2002). Ethane is not a VOC.
2. Up to 2% of total HCl emissions from Unit 02 are thought to be exhausted through Stack ID 127 based on Letter to SCDHEC documenting a modification to the anode coating application process, dated March 10, 2003.

FACILITY WIDE EMISSIONS		
Pollutant	**Uncontrolled Emissions**	**Controlled Emissions**
	TPY	**TPY**
Total Emissions for 1900-0206		
HCl	195	5
CO_2e	8.9	8.9
VOC	15	15
	Emissions from facility 1900-0172	

FACILITY WIDE EMISSIONS		
Pollutant	**Uncontrolled Emissions**	**Controlled Emissions**
	TPY	**TPY**
HCl	2.04	1.6
CO_2e	70,807	70,807
VOC	0.62	0.62
Total for the two facilities		
HCl	197.04	6.6
VOC	15.62	15.62
Cl_2	215	1.1
PM	4812	37
PM_{10}	121	10
PM2.5	119	8
SO_2	22	22
NOx	65	65
CO	15	15
CO_2e	70,815.9	70,815.9
Total HAPS	412.04	7.7

OPERATING PERMIT STATUS

This facility has potential uncontrolled HCl emissions above the 10 TPY applicability thresholds, however with a control device, the potential to emit of this pollutant falls below the applicability threshold so the facility is not considered to be a "major" source as defined under the Title V regulations. This source is also collocated with Permit No. CM-1900-0172 which has uncontrolled PM, PM_{10}, and $PM_{2.5}$ emissions above threshold quantities. Total HAP's and criteria pollutant emissions from both facilities exceed the major thresholds for Tile V and PSD applicability . In order to become Conditional Major facilities for the criteria pollutants and an area sources for HAPs these facilities will have a Federally enforceable operating limitations of less than 25 tons of total HAPs, less than 10 tons of a single HAP, and less than 100 tons per year of PM, PM_{10}, and $PM_{2.5}$.

REGULATORY APPLICABILITY REVIEW

Regulation	Comments/Periodic Monitoring Requirements
Section II.E - Synthetic Minor	This is an operating permit with synthetic minor limits (Please see the discussion above).
Standard No. 1: Fuel Burning Operations	This facility has no fuel burning sources.
Standard No. 3 -Waste Combustion/Reduction (state only)	This process does not contain waste combustion or reduction sources.
Standard No. 4- Emissions from Process Industries	All emissions sources, including any fugitives, in this process are subject to 20% opacity limits under this standard. Particulate matter emissions are expected to be non existent: 02: There will not be enough water vapor present to condense the HCl into mist. The facility expects all the HCl to be in gaseous form. The ovens operate at about 500ºC. 03: The methal etching process is not expected to have PM emissions.
Standard No. 5: BACT/LAER For VOC (state only)	N/A-The facility was not in existence in 1979 or 1980.
Standard No. 5.1 (state only)	N/A- This facility is collocated with the other FinnChem facility (1900-0206). These facilities do not have the PTE of 100 TPY of VOCs. The baseline for both facilities is 0 TPY. PTE for this facility (1900-0206) is 15.27 tpy=~16tpy, for the other facility (1900-0172) 0.66 tpy.
Standard No. 5.2- Control of Oxides of Nitrogen	The facility only has electric curing ovens and they are less than 1 Million Btu/hr.
Standard No. 7-: Prevention of Significant Deterioration	These facilities are not major for PSD based on the synthetic minor emission limits.

Regulation	Comments/Periodic Monitoring Requirements
61-62.6 -Control of Fugitive Particulate Matter	The fugitive PM emissions are controlled in such a manner that should not produce undesirable levels.
NSPS: 40 CFR 60 and 61-62.60	This facility does not contain sources subject to this standard
NESHAP: 40 CFR 61 and 61-62.61-	This facility does not emit the pollutants subject to this standard. None of the Subparts that apply to coating processes apply to this facility.
40 CFR 63 and 61-62.63- MACT and Area Source Standards and **Regulation 61-62.63:** NESHAP For Source Categories	This process is not subject to any MACT standard at this time because it is not a major source of HAPs.(The Metal Etching process has the potential to emit greater than 10 tpy of HCl which is a HAP, but with the use of a Caustic Scrubber, the emissions will be controlled to less than 10 tpy). The area source MACT , Subpart HHHHHH is not applicable because this facility's pollutants are not in the List of the 33 urban air toxics. The facility is not subject to Subpart VVVVVV because it does not use feedstocks, generate as byproducts, or produces as products any of the 15 chemical manufacturing organic urban HAPs or metal HAPs listed in Table 1 of this subpart. The standards of this subpart do not apply to hydrogen halides at affected sources except when these HAPs are generated in combustion-based emission control devices that are used to meet the proposed standards. The source emits HCl, but it is neither an affected source, as stated above, nor does it have any combustion based control device.
61-62.68 -Chemical Accident Prevention	This process does not store or use chemicals subject to 112r above the threshold quantities.
40 CFR 64: - Compliance Assurance Monitoring (CAM)	Not a Title V facility.

MODELING REVIEW

Regulation	Comments/Periodic Monitoring Requirements
Standard No. 2	This facility has demonstrated compliance through modeling; see modeling summary dated 08/15/2013.
Standard No. 7.c**:** Ambient Air Increments	This facility has demonstrated compliance through modeling; see modeling summary dated 08/15/2013.
Standard No. 8 : Toxic Air Pollutants (state only)	This facility has demonstrated compliance through modeling for all TAPs; see modeling summary dated 08/15/2013.

PUBLIC NOTICE
This Conditional Major Permit will undergo a 30-day public notice period in accordance with SC Regulation 61-62.1, Section II(N). This permit was placed in *The State* newspaper on August 30, 2013. The comment period was open from August 30, 2013 to September 28, 2013 and was placed on the BAQ website during that time period. Comments were received during the comment period. They have been addressed in the Response to Comments document.

ADDITIONAL PUBLIC PARTICIPATION N/A

SUMMARY AND CONCLUSIONS
It has been determined that this source, if operated in accordance with the submitted application, will meet all applicable requirements and emission standards.