

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION APPLICATION PROCESSING AND CALCULATIONS	PAGE 1	PAGES 6
	APPL. NO. Various	DATE 10/10/2008
	PROCESSOR MFN	REVIEWER

CHANGE OF CONDITION, EQUIPMENT MODIFICATION
AND PERMIT TO CONSTRUCT/OPERATE ANALYSIS

FACILITY MAILING ADDRESS

Sierra Aluminum Company
2345 Fleetwood Drive
Riverside, CA 92509

(ID: 085943 NOx RECLAIM Cycle 2 - TITLE V)

EQUIPMENT LOCATION

11711-11806 Pacific Avenue
Fontana, CA 92337

EQUIPMENT DESCRIPTION

APPLICATION NO. 475465 - FACILITY PERMIT MODIFICATION

APPLICATION NO. 475466 - CHANGE OF CONDITION
PROCESS 4: ALUMINUM EXTRUSION

(D3) AGING FURNACE NO. 1, END FLOW TYPE, GRANCO-CLARK, MODEL NO 9102, SERIAL NO. 2043762, 9'-0" W. X 50'-0" L. X 6'-0" H., 2,500,000 BTU PER HOUR, NATURAL GAS FIRED, WITH A 50-HP RECIRCULATION FAN AND A 1-HP COMBUSTION AIR BLOWER.

APPLICATION NO. 475467 - CHANGE OF CONDITION
PROCESS 4: ALUMINUM EXTRUSION

(D4) AGING FURNACE NO. 2, END FLOW TYPE, GRANCO-CLARK, MODEL NO 9102, SERIAL NO. 2043762, 9'-0" W. X 50'-0" L. X 6'-0" H., 2,500,000 BTU PER HOUR, NATURAL GAS FIRED, WITH A 50-HP RECIRCULATION FAN AND A 1-HP COMBUSTION AIR BLOWER.

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APPLICATION NO. 475468 - PERMIT TO CONSTRUCT
PROCESS 5: CONTROL EQUIPMENT

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. SCRUBBER, DUALL DIVISION, COUNTER-CURRENT, VERTICAL PACKED-BED, MODEL NO. FW303-80, 6'-8" DIA. X 15'-7" H., WITH 2" POLYPROPYLENE SPHERICAL PACKING AND A 7.5 HP RECIRCULATION PUMP.
2. EXHAUST SYSTEM WITH A 25-HP BLOWER VENTING AN ANODIZING TANK, DEVICE ID D87.

APPLICATION NO. 475469 - PERMIT TO CONSTRUCT
MODIFICATION OF SULFURIC ACID ANODIZING LINE, PROCESS 1, SYSTEM 1
BY THE REMOVAL OF:

ACID CLEAN TANK NO. 1, DEVICE ID D43
GOLD DYE TANK NO. 25, DEVICE ID D50

BY THE ADDITION OF:

SULFURIC ANODIZE TANK NO. 18, DEVICE ID D87

BY THE MODIFICATION OF:

SULFURIC ANODIZE TANK NO. 19, DEVICE ID D48

BY THE CHANGE OF CONDITION FOR:

SULFURIC ANODIZE TANK NO. 17, DEVICE ID D47
SULFURIC ANODIZE TANK NO. 19, DEVICE ID D48

HISTORY

Application No. 475465 was filed on November 7, 2007, for a RECLAIM/Title V Facility Permit Modification. Application Nos. 475466 and 475467 were filed on November 7, 2007, for administrative change of condition permits. Application No. 475468 was filed on November 7, 2007, for a Class I Permit to Construct/Operate. Application No. 475469 was filed on November 7, 2007, for equipment modification and change of condition.

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limited to Sodium Hydroxide and Sulfuric Acid, which are present in various concentrations in 7 of 10 the tanks of the SAL, the remaining 3 tanks have non-toxic, non-volatile compounds. Emissions will be calculated using the spreadsheet developed by the Toxic Unit for open process tanks. For Rule 1401 Risk Assessment purposes, the actual contaminant/chemical emission rates will be used, however for PPS and NSR purposes emissions will be combined and entered as PM₁₀.

The applicant has requested that the rectifier for D48 be increased from 12500 amperes to 20000 amperes. The applicant has also requested an “increase” to their yearly ampere-hour limit to both tanks D47 and D48. A yearly ampere-hour usage limit had not been previously conditioned to either tank, the requested 1.2×10^8 ampere-hour/year limit has been used to calculate emissions and has now been conditioned to both tanks.

Given:

- Operating Schedule – 16 hrs/day, 5 days/wk, 49 wks/year
- 20 hrs/day, 6 days/wk, 50 wks/year (6000 hrs/year maximum)

Etching tanks, D44 & D45 – 6.7-7.9% NaOH @ 140°F – Vented to C53
Sulfuric acid anodizing, D47 & D48 – 14.8-16.6% H₂SO₄ @ 71°F – Vented to C55
New sulfuric acid anodizing tank – 14.8-16.6% H₂SO₄ @ 71°F – Vented to new Scrubber
Acid deoxidizing, D46 – 4.5-6.0% H₂SO₄ @ 77°F – Not vented to control
Color anodize, D49 – 1.5-2.1% H₂SO₄ @ 70°F – Not vented to control and operated less than half of the time of the other tanks, a time limiting condition will be included.

See attached spreadsheet for detailed emission calculations.

RULES COMPLIANCE

RULE 212 Public Notification

Paragraph 212 (c)(1) Requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. According to the website geodistance.com the closest school, Chaparral Elementary School is over 1 mile from Sierra Aluminum’s property line. A 30-Day Public Notice is not required under this paragraph.

Paragraph 212(c)(2) The equipment will not result in on-site emission increase exceeding the daily maximums as specified in the table in Rule

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212(g). Therefore, a 30-day public notice period will not be required under this paragraph.

Paragraph 212(c)(3) Public notice will not be required under this paragraph. See Rule 1401 evaluation section.

RULE 401 Visible emissions are not expected with proper operation and maintenance of this equipment.

RULE 402 Nuisance is not expected with proper operation and maintenance of this equipment.

REG XIII/XX: There is currently no BACT requirement listed for sulfuric acid anodizing lines in the Minor Source BACT Guidelines. The tanks with rectifiers are vented to scrubbers which meet Major Source achieved in practice BACT/LAER.

BACT for Metal Heating Furnaces is Natural Gas Combustion for SO_x and Inorganic compounds. For NO_x, BACT is both Natural Gas Combustion and a low NO_x burner with ≤ 50 ppmv. NO_x emissions at 70 ppmv were first entered in 1997 prior to the October 2000 effective date of the NO_x BACT requirement.

Modeling

The PM₁₀ emission rate of the anodizing line (0.05389 lb/hr) is below the screening level of Table A-1 (0.41lb/hr). No further modeling is required.

Offsets

Sierra Aluminum is in NO_x RECLAIM, there is no actual increase of NO_x emissions associated with any of the current application requests.

All other criteria pollutants are below Table A of Rule 1304 (d), even with the 30-Day average PM₁₀ emission increase of 1 pound.

Offsets are not required at this time.

RULE 1401 The sulfuric acid anodizing line is in compliance with Tier 2 Screening Risk Assessment. See attached Rule 1401 calculation sheets.

REG XXX This is a de minimus significant permit revision; a 45-day EPA review is required.

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RECOMMENDATION

Issue Permit to Operate as described in this evaluation and noted in the Facility Permit.

Aging Furnace No. 1, Device ID D3, A/N 475466

Issue Permit to Operate with requested administrative change of condition requested, lower NOx RECLAIM concentration limit to 40 ppmv.

Aging Furnace No. 2, Device ID D4, A/N 475467

Issue Permit to Operate with requested administrative change of condition requested, lower NOx RECLAIM concentration limit to 40 ppmv.

Vertical Fume Scrubber, Device ID C88, A/N 475468

Issue Permit to Construct/Operate as described in this evaluation and noted in the Facility Permit.

Sulfuric Acid Anodizing Line, Device IDs D42-D52 & D87, A/N 475467

Issue Permit to Operate as described in this evaluation and noted in the Facility Permit

- Change of condition to increase yearly ampere-hour limit to 1.2×10^8 for tanks D47 & D48
- Add new tank D87
- Modification to tank D48 to increase the rectifier to 20000 amperes

**Sierra Aluminum
Sulfuric Acid Anodizing Line**

EMISSIONS FROM OPEN PROCESS TANKS DUE TO ELECTROLYSIS AND EVAPORATION

TOTAL
R1(EVAP)= 0.000 LB/HR (vaporized acids and/or ammonia--these are reported as total PM)
R1(PLAT)= 1.999 LB/HR (Total PM)

R2(EVAP)= 0.000 LB/HR (vaporized acids and/or ammonia--these are reported as total PM)
R2(PLAT)= 0.108 LB/HR (Total PM)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
ambient temp=	77 F																			air	air				
TANK No.	Chemical	WT %	OPER. T Deg F	V.P. mm HG	MW	VENT RATE CFM	Surface W x L ft x ft	I amps	CATHODE PLATING EFF. %	EVAP APCS EFF. %	PLATING APCS EFF. %	EVAP R1 lb/hr	EVAP R2 lb/hr	PLATING R1 lb/hr	PLATING R2 lb/hr	Conc. lb/cu.ft	Dab ft^2/sec	u lb/ft-sec	p lb/ft^3	Re	Sc	Sh	k ft/sec		
44	Sodium Hydroxide	7.900	140.0	0.00000	40.00	22500	225.00	0	0.00000	75.00	0.00	0.000000	0.000000	0.000000	0.000E+00	0.0000	0.0002	0.00001	0.07387	148690	1.02	258.81	0.0029		
45	Sodium Hydroxide	7.900	140.0	0.00000	40.00	22500	225.00	0	0.00000	75.00	0.00	0.000000	0.000000	0.000000	0.000E+00	0.0000	0.0002	0.00001	0.07387	148690	1.02	258.81	0.0029		
46	Sulfuric Acid	6.000	77.0	0.00000	98.08	9900	225.00	0	0.00000	0.00	0.00	0.000000	0.000000	0.000000	0.000E+00	0.0000	0.0001	0.00001	0.07387	65424	1.86	257.02	0.0015		
47	Sulfuric Acid	16.600	71.0	0.00000	98.08	20250	225.00	20000	0.00000	0.00	95.00	0.000000	0.000000	0.369627	1.848E-02	0.0000	0.0001	0.00001	0.07387	133821	1.88	370.35	0.0022		
87	Sulfuric Acid	16.600	71.0	0.00000	98.08	15750	225.00	12500	0.00000	0.00	99.00	0.000000	0.000000	0.231017	2.310E-03	0.0000	0.0001	0.00001	0.07387	104083	1.88	326.61	0.0019		
48	Sulfuric Acid	16.600	71.0	0.00000	98.08	20250	225.00	20000	0.00000	0.00	95.00	0.000000	0.000000	0.369627	1.848E-02	0.0000	0.0001	0.00001	0.07387	133821	1.88	370.35	0.0022		
49	Sulfuric Acid	2.100	70.0	0.00000	98.08	9900	225.00	12500	0.00000	0.00	50.00	0.000000	0.000000	0.029225	1.461E-02	0.0000	0.0001	0.00001	0.07387	65424	1.89	259.27	0.0015		

0.99950 0.05389

For cases where there is no ventilation, use assumed ventilation rate = 44 CFM per square foot of tank area.

Copy each entire line to increase the number of compounds.

Enter data only in columns A through L.

Notes: R1 = uncontrolled emissions.
R2 = controlled emissions -- This means the emission rate after applying the control efficiency.

**Sierra Aluminum
Sulfuric Acid Anodizing Line**

475465-9 Rule1401.xls

TIER 1 SCREENING RISK ASSESSMENT

Receptor Distance (actual)	100
Receptor Distance (for X/Q lookup)	100

Tier 1 Results	
Cancer/Chronic ASI	Acute ASI
1.25E+00 FAILED	1.68E-01 PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer / Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer / Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Sulfuric acid and oleum	1.11E+02	1.85E-02	2.58E+02	3.21E-01	4.30E-01	5.76E-02
Sulfuric acid and oleum	1.39E+01	2.31E-03	2.58E+02	3.21E-01	5.36E-02	7.19E-03
Sulfuric acid and oleum	1.11E+02	1.85E-02	2.58E+02	3.21E-01	4.30E-01	5.76E-02
Sulfuric acid and oleum	8.77E+01	1.46E-02	2.58E+02	3.21E-01	3.39E-01	4.55E-02
TOTAL (APPLICATION SCREENING INDEX)					1.25E+00	1.68E-01

TIER 2 SCREENING RISK ASSESSMENT

A/N: 475469
Fac: Sierra Aluminum

Application deemed complete date: 11/30/07

2. Tier 2 Data

MET Factor	1.19
4 hr	0.92
6 or 7 hrs	0.78

Dispersion Factors

3	3A & 3B For Chronic X/Q
6	For Acute X/Q

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

Receptor	X/Q	X/Qmax
Residential	0.26	16.55
Commercial	5.32	295.2

Adjustment and Intake Factors

	Afann	DBR	EVF
Residential	1	302	0.96
Worker	1.4	149	0.38

A/N: 475469

Application deemed complete date: 11/30/07

TIER 2 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
Sulfuric acid and oleum		
Total	PASS	PASS

No Cancer Burden, MICR<1.0E-6

5b. Cancer Burden	no
X/Q for one-in-a-million:	
Distance (meter)	no data
Area (km2):	
Population:	
Cancer Burden:	

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			Pass	Pass
Developmental - DEV			Pass	Pass
Endocrine system - END			Pass	Pass
Eye			Pass	Pass
Hematopoietic system - HEM			Pass	Pass
Immune system - IMM			Pass	Pass
Kidney - KID			Pass	Pass
Nervous system - NS			Pass	Pass
Reproductive system - REP			Pass	Pass
Respiratory system - RES	1.33E-01	1.02E+00	Pass	Fail
Skin			Pass	Pass

A/N: 475469

Application deemed complete date:

11/30/07

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
Sulfuric acid and oleum									2.55E-03	
Sulfuric acid and oleum									3.19E-04	
Sulfuric acid and oleum									2.55E-03	
Sulfuric acid and oleum									2.01E-03	
Total									7.44E-03	

HIA - Commercial										
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Sulfuric acid and oleum									4.55E-02	
Sulfuric acid and oleum									5.68E-03	
Sulfuric acid and oleum									4.55E-02	
Sulfuric acid and oleum									3.59E-02	
Total									1.33E-01	

6b. Hazard Index Chronic

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

Compound	HIC - Residential												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Sulfuric acid and oleum												1.72E-02	
Sulfuric acid and oleum												2.14E-03	
Sulfuric acid and oleum												1.72E-02	
Sulfuric acid and oleum												1.36E-02	
Total												5.00E-02	

A/N: 475469

Application deemed complete date: 11/30/07

6b. Hazard Index Chronic (cont.)

Compound	HIC - Commercial												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Sulfuric acid and oleum												3.51E-01	
Sulfuric acid and oleum												4.39E-02	
Sulfuric acid and oleum												3.51E-01	
Sulfuric acid and oleum												2.77E-01	
Total												1.02E+00	