Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	4.59E-06	0.04	0.086	-	5.34E-05	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					5.34E-05	-	

Monthly throughput limit: 11,348 gals/month

ATTACMENT
POLY ETCH
T-155
Vertical
Control: 492806

Previous:	F54707	383502	A/N:	460730
Given:				
Tank dimentior	ft	in		
DIA.	4	6		
H	5	6		
Working volume			375	gals
Desired thoughput:			136,176	gals/yr
Turnovers per year			363	
Month selected for emission calculations:			July	
Number of days in July:			31	
Total pressure:			0.38	psia
Maximum emissions**				
Working			0.62	lb/month
Breathing			0.08	lb/month
Note: **From TANK 4.0.9d Emissions Report			0.7	
Weight% of PM in vapor:			9.75%	
Control efficiency:			95%	
Operating Schedule:				
hrs/day			24	hrs/day
days/wk			7	days/wk
weeks/yr			52	wks/yr
PM10 in PM			100%	

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.62 + 0.08) lb/month =	0.70	lb/month
PM/HNO_3			
lb/day			
Uncontrolled	0.7 lb/month/31 days/month*0.0975 =	0.002	lb/day
Controlled	0.002 lb/day*(1-7) =	0.0001	lb/day
lb/hr			
Uncontrolled	0.002 lb/day/ hrs/day =	0.00009	lb/hr
Controlled	0.0001 lb/day/ hrs/day =	0.00000	lb/hr
lb/yr	0.0001 lb/day* days/wk*0.7 wks/yr =	0.04	lb/yr

	PM/PM10	HNO_3
lb/hr		
Uncontr.	9.17E-05	9.17E-05
Contr.	4.59E-06	4.59E-06
lb/day		
Uncontr.	2.20E-03	2.20E-03
Contr.	1.10E-04	1.10E-04
lb/yr (Contr.)	0.04	0.04

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

Emissions Report for: July

T-151 Prev Rev1 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Poly Etch	0.16	0.08	0.24

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

T-151 Prev Rev1 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0784			
Vapor Space Volume (cu ft):							48.6458			
Vapor Density (lb/cu ft):							0.0013			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9420			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							48.6458			
Tank Diameter (ft):							4.5000			
Vapor Space Outage (ft):							3.0587			
Tank Shell Height (ft):							5.5000			
Average Liquid Height (ft):							2.7500			
Roof Outage (ft):							0.3087			
Roof Outage (Dome Roof)										
Roof Outage (ft):							0.3087			
Dome Radius (ft):							4.5000			
Shell Radius (ft):							2.2500			
Vapor Density										
Vapor Density (lb/cu ft):							0.0013			
Vapor Molecular Weight (lb/lb-mole):							19.4000			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3800			
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			
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):							0.3800			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.3800			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.3800			
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:							0.9420			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.3800			
Vapor Space Outage (ft):							3.0587			
Working Losses (lb):							0.1610			
Vapor Molecular Weight (lb/lb-mole):							19.4000			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3800			
Net Throughput (gal/mo.):							917.0000			
Annual Turnovers:							16.8257			
Turnover Factor:							1.0000			
Maximum Liquid Volume (gal):							654.0000			
Maximum Liquid Height (ft):							5.5000			
Tank Diameter (ft):							4.5000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.2393			

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

T-151 Prev Rev1 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Poly Etch	Jul	71.26	65.04	77.47	64.33	0.3800	0.3800	0.3800	19.4000			0.00	

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

Identification

User Identification:	T-151 Prev Rev1
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):	2.75
Volume (gallons):	654.00
Turnovers:	16.83
Net Throughput(gal/yr):	11,004.00
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

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

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

T-151 Rev1 2 26 09 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0784			
Vapor Space Volume (cu ft):							48.6458			
Vapor Density (lb/cu ft):							0.0013			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9420			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							48.6458			
Tank Diameter (ft):							4.5000			
Vapor Space Outage (ft):							3.0587			
Tank Shell Height (ft):							5.5000			
Average Liquid Height (ft):							2.7500			
Roof Outage (ft):							0.3087			
Roof Outage (Dome Roof)										
Roof Outage (ft):							0.3087			
Dome Radius (ft):							4.5000			
Shell Radius (ft):							2.2500			
Vapor Density										
Vapor Density (lb/cu ft):							0.0013			
Vapor Molecular Weight (lb/lb-mole):							19.4000			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3800			
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			
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):							0.3800			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.3800			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.3800			
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:							0.9420			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.3800			
Vapor Space Outage (ft):							3.0587			
Working Losses (lb):							0.6190			
Vapor Molecular Weight (lb/lb-mole):							19.4000			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3800			
Net Throughput (gal/mo.):							11,348.0000			
Annual Turnovers:							208.2202			
Turnover Factor:							0.3107			
Maximum Liquid Volume (gal):							654.0000			
Maximum Liquid Height (ft):							5.5000			
Tank Diameter (ft):							4.5000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.6973			

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

Emissions Report for: July

T-151 Rev1 2 26 09 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Poly Etch	0.62	0.08	0.70

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

T-151 Rev1 2 26 09 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Prese Calculations
Poly Etch	Jul	71.26	65.04	77.47	64.33	0.3800	0.3800	0.3800	19.4000			0.00	

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

Identification

User Identification:	T-151 Rev1 2 26 09
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):		2.75
Volume (gallons):		654.00
Turnovers:		208.22
Net Throughput(gal/yr):		136,176.00
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

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

Previous: F54711 381810 A/N: 460729

Mixture Vapor Pressure
POLY ETCH
T-151

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP mmHg	moles fraction	Weight Contribution	wt% w/ water	wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HNO_3	56	56%	63.01	0.581	0.030	1.89	10%	100%
NH_4F (Solid)	0.3	0%	37.04	-	-	-	-	-
Water	44	44%	18.02	18.8	0.970	17.48	90%	-
	100	100%		19.399	1.00	19.3628	100%	100%
			psia	0.38		w/o water	9.7%	

		Previous
Desired throughput	11,348 gals/month	917 gals/month
	136,176 gals/yr	11,004 gals/yr

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	1.57E-06	0.01	0.086	-	1.83E-05	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					1.83E-05	-	

Monthly throughput limit: 917 gals/month

ATTACMENT
POLY ETCH
T-151
Vertical
Control: Scrubbers

Subsequent: 460729 A/N: 381810

Given:

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

Working volume	654	gals
Desired thoughput:	11,004	gals/yr
Turnovers per year	17	
Month selected for emission calculations:	July	
Number of days in July:	31	
Total pressure:	0.375	psia
Maximum emissions**		
Working	0.16	lb/month
Breathing	0.08	lb/month
Note: **From TANK 4.0.9d Emissions Report	0.24	
Weight% of PM in vapor:	9.75%	
Control efficiency:	95%	
Operating Schedule:		
hrs/day	24	hrs/day
days/wk	7	days/wk
weeks/yr	52	wks/yr
PM10 in PM	100%	

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.16 + 0.08) lb/month =	0.24	lb/month
PM/HNO_3			
lb/day			
Uncontrolled	0.24 lb/month/31 days/month*0.0975 =	0.001	lb/day
Controlled	0.001 lb/day*(1-7) =	0.0000	lb/day
lb/hr			
Uncontrolled	0.001 lb/day/ hrs/day =	0.00003	lb/hr
Controlled	0 lb/day/ hrs/day =	0.00000	lb/hr
lb/yr	0 lb/day* days/wk*0.24 wks/yr =	0.01	lb/yr

	PM/PM10	HNO_3
lb/hr		
Uncontr.	3.14E-05	3.14E-05
Contr.	1.57E-06	1.57E-06
lb/day		
Uncontr.	7.55E-04	7.55E-04
Contr.	3.77E-05	3.77E-05
lb/yr (Contr.)	0.01	0.01

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	4.59E-06	0.04	0.086	-	5.34E-05	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					5.34E-05	-	

Monthly throughput limit: 11,348 gals/month

ATTACMENT
POLY ETCH
T-151
Vertical
Control: 492806

Previous:	F54711	381810		A/N:	460729
Given:					
Tank dimentior	ft	in	gals		
DIA.	4	6	654		
H	5	6			
Working volume				654	gals
Desired thoughput:				136,176	gals/yr
Turnovers per year				208	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total pressure:				0.38	psia
Maximum emissions**					
Working				0.62	lb/month
Breathing				0.08	lb/month
Note: **From TANK 4.0.9d Emissions Report				0.7	
Weight% of PM in vapor:				9.75%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.62 + 0.08) lb/month =	0.70	lb/month
PM/HNO_3			
lb/day			
Uncontrolled	0.7 lb/month/31 days/month*0.0975 =	0.002	lb/day
Controlled	0.002 lb/day*(1-7) =	0.0001	lb/day
lb/hr			
Uncontrolled	0.002 lb/day/ hrs/day =	0.00009	lb/hr
Controlled	0.0001 lb/day/ hrs/day =	0.00000	lb/hr
lb/yr	0.0001 lb/day* days/wk*0.7 wks/yr =	0.04	lb/yr

	PM/PM10	HNO_3
lb/hr		
Uncontr.	9.17E-05	9.17E-05
Contr.	4.59E-06	4.59E-06
lb/day		
Uncontr.	2.20E-03	2.20E-03
Contr.	1.10E-04	1.10E-04
lb/yr (Contr.)	0.04	0.04

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

Emissions Report for: July

T-141 Prev Rev1 2 26 09 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Aluminum Etch	0.29	1.38	1.66

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

T-141 Prev Rev1 2 26 09 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							1.3756			
Vapor Space Volume (cu ft):							502.5047			
Vapor Density (lb/cu ft):							0.0023			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9029			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							502.5047			
Tank Diameter (ft):							7.0000			
Effective Diameter (ft):							13.5204			
Vapor Space Outage (ft):							3.5000			
Tank Shell Length (ft):							20.5000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0023			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
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):							523.9983			
Tank Paint Solar Absorptance (Shell):							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):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9029			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.5800			
Vapor Space Outage (ft):							3.5000			
Working Losses (lb):							0.2858			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800			
Net Throughput (gal/mo.):							917.0000			
Annual Turnovers:							1.8651			
Turnover Factor:							1.0000			
Tank Diameter (ft):							7.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							1.6615			

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

T-141 Prev Rev1 2 26 09 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Aluminum Etch	Jul	71.26	65.04	77.47	64.33	0.5800	0.5800	0.5800	22.5700			0.00	

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

Identification

User Identification:	T-141 Prev Rev1 2 26 09
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:		1.87
Net Throughput(gal/yr):		11,004.00
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

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

3700 West 190th Street
Torrance CA 90509
(310) 212-4522 - Phone
(310) 212-4681 - Fax
(714) 814-2837 - Cell
7148142837@messaging.nextel.com - Text Message

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

T-141 Rev1 2 26 09 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							1.3756			
Vapor Space Volume (cu ft):							502.5047			
Vapor Density (lb/cu ft):							0.0023			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9029			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							502.5047			
Tank Diameter (ft):							7.0000			
Effective Diameter (ft):							13.5204			
Vapor Space Outage (ft):							3.5000			
Tank Shell Length (ft):							20.5000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0023			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
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):							523.9983			
Tank Paint Solar Absorptance (Shell):							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):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9029			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.5800			
Vapor Space Outage (ft):							3.5000			
Working Losses (lb):							2.6954			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800			
Net Throughput (gal/mo.):							8,648.0000			
Annual Turnovers:							17.5892			
Turnover Factor:							1.0000			
Tank Diameter (ft):							7.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							4.0711			

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

Emissions Report for: July

T-141 Rev1 2 26 09 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Aluminum Etch	2.70	1.38	4.07

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

T-141 Rev1 2 26 09 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Aluminum Etch	Jul	71.26	65.04	77.47	64.33	0.5800	0.5800	0.5800	22.5700			0.00	

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

Identification

User Identification:	T-141 Rev1 2 26 09
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:		17.59
Net Throughput(gal/yr):		103,776.00
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

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

Previous: F54710 381808 A/N: 460728

Mixture Vapor Pressure
ALUMINUM ETCH
T-141

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP* mmHg	moles fraction	Weight Contribution	wt% w/ water	wt% w/o water w/acetic	wt% w/o water w/o acetic
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HNO_3	1	1%	63.01	-	-	-	-	-	-
H_3PO_4	76	76%	98.00	0.03	0.001	0.10	0.4%	1%	1.00
CH_3COOH	8	8%	37.04	11.00	0.37	13.65	54.4%	99%	-
Water	15	15%	18.02	18.8	0.63	11.36	45%	-	-
Total	100	100%		29.85	1.00	25.1056	100%	100%	100%
				0.58		W/o water	55%	W/o acetic	0.39%

*Vapor pressures at 100% H3PO4 and 100 CH3COOH are used.

			Previous
Desired throughput	8648	gals/month	917
	103,776	gals/yr	11,004

H_3PO_4 100% of PM

lb/day

Uncontrolled	0.0002 lb/day*1 =	0.0002 lb/day
Controlled	0.0002 lb/day*(1-0.95) =	0.00001 lb/day

lb/hr

Uncontrolled	0.0002 lb/day/24 hrs/day =	0.00001 lb/hr
Controlled	0.00001 lb/day/24 hrs/day =	4.40E-07 lb/hr

lb/yr	0.00001 lb/day*7 days/wk*52 wks/yr =	0.004 lb/yr

$C_2H_4O_2$

lb/day

Uncontrolled	1.67 lb/month/31 days/month*0.5476*1 =	0.029 lb/day
Controlled	0.029 lb/day*(1-0) =	0.0295 lb/day

lb/hr

Uncontrolled	0.029 lb/day/24 hrs/day =	0.0012 lb/hr
Controlled	0.0295 lb/day/24 hrs/day =	0.00123 lb/hr

lb/yr	0.0295 lb/day*7 days/wk*52 wks/yr =	10.74 lb/yr

	PM/PM10	HNO_3	H_3PO_4	$C_2H_4O_2$
lb/hr				
Uncontr.	8.81E-06	-	8.81E-06	1.23E-03
Contr.	4.40E-07	-	4.40E-07	1.23E-03
lb/day				
Uncontr.	2.11E-04	-	2.11E-04	2.95E-02
Contr.	1.06E-05	-	1.06E-05	2.95E-02
lb/yr (Contr.)	0.00	-	0.004	10.74

Rule 1401 Evaluation:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	0.00E+00	-	0.043	-	0.00E+00	-	Yes
H_3PO_4	4.40E-07	0.004	-	231.00	-	1.67E-05	
			-	-	-	-	
Total					0.00E+00	1.67E-05	

Monthly throughput limit: 5902 gals*1.86 times/yr/12 months/yr*1 = 917 gals/month

ATTACMENT
ALUMINUM ETCH
T-141
Horizontal
Control: Scrubbers

Subsequent:	460728			A/N:	381808
Given:					
Tank dimentior	ft	in	gals		
DIA.	7	0	5,902		
L	20	6			
Working volume				5,902	gals
Desired thoughput:				11,004	gals/yr
Turnovers per year				1.86	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure:				0.58	psia
Maximum emissions**					
Working				0.29	lb/month
Breathing				1.38	lb/month
Note: **From TANK 4.0.9d Emissions Report					
Weight fraction of all acids in vapor:				54.76%	
Weight fraction of acids (excluding acetic acid) in vapor:				0.39%	
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				100%	
Cushion factor:				1.0	
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(0.29 + 1.38) lb/month =	1.67	lb/month
PM					
lb/day					
Uncontrolled			1.67 lb/month/31 days/month*0.0039*1 =	0.000	lb/day
Controlled			0 lb/day*(1-0.95) =	0.0000	lb/day
lb/hr					
Uncontrolled			0 lb/day/24 hrs/day =	0.00001	lb/hr
Controlled			0 lb/day/24 hrs/day =	0.00000	lb/hr
lb/yr			0 lb/day*7 days/wk*52 wks/yr =	0.00	lb/yr
HNO_3	0% of PM				
lb/day					
Uncontrolled			0 lb/day*0 =	0.000	lb/day
Controlled			0 lb/day*(1-0.95) =	0.0000	lb/day
lb/hr					
Uncontrolled			0 lb/day/24 hrs/day =	0.0000	lb/hr
Controlled			0 lb/day/24 hrs/day =	0.00000	lb/hr
lb/yr			0 lb/day*7 days/wk*52 wks/yr =	0.00	lb/yr

H_3PO_4 100% of PM

lb/day

Uncontrolled	0.001 lb/day*1 =	0.0005 lb/day
Controlled	0.0005 lb/day*(1-0.95) =	0.00003 lb/day

lb/hr

Uncontrolled	0.0005 lb/day/24 hrs/day =	0.00002 lb/hr
Controlled	0.00003 lb/day/24 hrs/day =	1.08E-06 lb/hr

lb/yr 0.00003 lb/day*7 days/wk*52 wks/yr = 0.009 lb/yr

$C_2H_4O_2$

lb/day

Uncontrolled	4.08 lb/month/31 days/month*0.5476*1 =	0.072 lb/day
Controlled	0.072 lb/day*(1-0) =	0.0721 lb/day

lb/hr

Uncontrolled	0.072 lb/day/24 hrs/day =	0.0030 lb/hr
Controlled	0.0721 lb/day/24 hrs/day =	0.00300 lb/hr

lb/yr 0.0721 lb/day*7 days/wk*52 wks/yr = 26.23 lb/yr

	PM/PM10	HNO_3	H_3PO_4	$C_2H_4O_2$
lb/hr				
Uncontr.	2.15E-05	-	2.2E-05	3.00E-03
Contr.	1.08E-06	-	1.08E-06	3.00E-03
lb/day				
Uncontr.	5.16E-04	-	5.16E-04	7.21E-02
Contr.	2.58E-05	-	2.58E-05	7.21E-02
lb/yr (Contr.)	0.01	-	0.009	26.23

Rule 1401 Evaluation:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	0.00E+00	-	0.043	-	-	-	Yes
H_3PO_4	1.08E-06	0.009	-	231.00	-	4.07E-05	
			-	-	-	-	
Total					-	4.07E-05	

Monthly throughput limit: 5902 gals*17.58 times/yr/12 months/yr*1 = 8,648 gals/month

ATTACMENT
ALUMINUM ETCH
T-141
Horizontal
Control: 492806

Previous:	F54710	381808		A/N:	460728
Given:					
Tank dimentior	ft	in	gals		
DIA.	7	0	5,902		
L	20	6			
Working volume				5,902	gals
Desired thoughput:				103,776	gals/yr
Turnovers per year				17.58	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure:				0.58	psia
Maximum emissions**					
Working				2.7	lb/month
Breathing				1.38	lb/month
Note: **From TANK 4.0.9d Emissions Report					
Weight fraction of all acids in vapor:				55%	
Weight fraction of acids (excluding acetic acid) in vapor:				0.39%	
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				100%	
Cushion factor:				1.0	
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(2.7 + 1.38) lb/month =	4.08	lb/month
PM					
lb/day					
Uncontrolled			4.08 lb/month/31 days/month*0.0039*1 =	0.001	lb/day
Controlled			0.001 lb/day*(1-0.95) =	0.0000	lb/day
lb/hr					
Uncontrolled			0.001 lb/day/24 hrs/day =	0.00002	lb/hr
Controlled			0 lb/day/24 hrs/day =	0.00000	lb/hr
lb/yr			0 lb/day*7 days/wk*52 wks/yr =	0.01	lb/yr
HNO_3	0% of PM				
lb/day					
Uncontrolled			0.001 lb/day*0 =	0.000	lb/day
Controlled			0 lb/day*(1-0.95) =	0.0000	lb/day
lb/hr					
Uncontrolled			0 lb/day/24 hrs/day =	0.0000	lb/hr
Controlled			0 lb/day/24 hrs/day =	0.00000	lb/hr
lb/yr			0 lb/day*7 days/wk*52 wks/yr =	0.00	lb/yr

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

Emissions Report for: July

T-503 Rev1 2 26 09 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Acids	31.87	0.09	31.96

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

T-503 Rev1 2 26 09 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0912			
Vapor Space Volume (cu ft):							34.9746			
Vapor Density (lb/cu ft):							0.0021			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9478			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							34.9746			
Tank Diameter (ft):							3.3000			
Effective Diameter (ft):							5.1950			
Vapor Space Outage (ft):							1.6500			
Tank Shell Length (ft):							6.4200			
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):							530.9285			
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/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):							0.6300			
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):							530.9285			
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:							0.9478			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.6300			
Vapor Space Outage (ft):							1.6500			
Working Losses (lb):							31.8734			
Vapor Molecular Weight (lb/lb-mole):							18.8600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6300			
Net Throughput (gal/mo.):							670,000.0000			
Annual Turnovers:							20,100.0000			
Turnover Factor:							0.1682			
Tank Diameter (ft):							3.3000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							31.9646			

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

T-503 Rev1 2 26 09 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pres Calculations
Waste Acids	Jul	71.26	65.04	77.47	64.33	0.6300	0.6300	0.6300	18.8600			0.00	

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

Identification

User Identification:	T-503 Rev1 2 26 09
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		6.42
Diameter (ft):		3.30
Volume (gallons):		400.00
Turnovers:		20,100.00
Net Throughput(gal/yr):		8,040,000.00
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

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

OK 2/25/09

Mole Fraction (M)	Wt Contribution	wt% w/ water	wt% w/o water
(8)	(9)	(10)	(11)
###	9.0510	47.85%	100.00%
##	9.8650	52.15%	-
###	18.92	100.00%	100.00%
	W/o water	47.8484%	

Previous: None - A/Nos: 460711 460713 460714

Mixture Vapor Pressure
WASTE ACIDS
T-502/T-503/T-511

Operating temperature 70 F 460711, 13, 14

Compounds	Amount, lb	Solution wt%	Molecular Weight	VP* mmHg	moles fraction	Weight Contribution	Wt% w/ water	Wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HF	5	5.00%	20.01	14.00	0.43	8.53	45.2%	100%
Water	95	95%	18.02	18.82	0.57	10.33	54.8%	-
	100	100%		32.82	1.00	18.8646	100%	100%
			psia	0.63		w/o water	45.2%	

	T-502	T-503	T-511	
Desired throughput	670,000	670,000	45,000	gals/month
	8,040,000	8,040,000	540,000	gals/yr
OK	9/24/08			

*For HF, the vapor pressure is vapor pressure of 48% HF solution
The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF, since it has higher vapor pressure than others.

	PM/PM10/Acids
lb/hr	
Uncontr.	0.02
Contr.	0.001
lb/day	
Uncontr.	0.47
Contr.	0.02
lb/yr (Contr.)	8.49

	50 m Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF.since it has higher vapor pressure than others. For risk screening, we use HNO_3 hourly emission and H_2SO_4 annual emission.

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	-	8.49	-	86.7	-	0.10	Yes
HNO_3	0.001	-	0.0857	-	0.01	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.011	0.10	

Monthly throughput limit: 384 gals*20938 times/yr/12 months/yr*1 = 670,000 gals/month

ATTACMENT
WASTE ACIDS
T-503
Rectangular
Control: 483796/492808

Previous:	None	-		A/N:	460714
Given:					
Dimensions:	ft	inches	gals		
W	4	0	384		
L	6	5		Convert to	
H	2	0		Horizontal	
Tank diameter (Used for calculations)*			D	3.2	ft
Tank length (Used for calculations)			L	6.42	ft

*Diameter of a circle whose area is equal to the surface cross section area.

Working volume	384	gals
Desired thoughput:	8,040,000	gals/yr
Turnovers per year	20,938	
Month selected for emission calculations:	July	
Number of days in July:	31	
Total vapor pressure	0.635	psia
Maximum emissions**		
Working	31.87	lb/month
Breathing	0.09	lb/month
Note: **From TANK 4.0.9d Emissions Report	31.96	
Weight% of acid in vapor:	45.24%	
Control efficiency:	95%	
Operating Schedule:		
hrs/day	24	hrs/day
days/wk	7	days/wk
weeks/yr	52	wks/yr
PM10 in PM	100%	
Cushion factor:	1.0	

(Cushion factor is used to give a cushion on the limit to insure compliance)

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(31.87 + 0.09) lb/month =	31.96	lb/month
PM/PM10/Acids			
lb/day			
Uncontrolled	31.96 lb/month/31 days/month*0.4524*1 =	0.47	lb/day
Controlled	0.47 lb/day*(1-0.95) =	0.02	lb/day
lb/hr			
Uncontrolled	0.47 lb/day/24 hrs/day =	0.019	lb/hr
Controlled	0.02 lb/day/24 hrs/day =	0.001	lb/hr
lb/yr	0.02 lb/day*7 days/wk*52 wks/yr =	8.49	lb/yr

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

Emissions Report for: July

T-502 Rev1 2 26 09 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Acid	31.93	0.11	32.04

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

T-502 Rev1 2 26 09 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.1090			
Vapor Space Volume (cu ft):							41.7843			
Vapor Density (lb/cu ft):							0.0021			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9478			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							41.7843			
Tank Diameter (ft):							3.3000			
Effective Diameter (ft):							5.6783			
Vapor Space Outage (ft):							1.6500			
Tank Shell Length (ft):							7.6700			
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):							530.9285			
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/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):							0.6300			
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):							530.9285			
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:							0.9478			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.6300			
Vapor Space Outage (ft):							1.6500			
Working Losses (lb):							31.9349			
Vapor Molecular Weight (lb/lb-mole):							18.8600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6300			
Net Throughput (gal/mo.):							670,000.0000			
Annual Turnovers:							16,509.2402			
Turnover Factor:							0.1685			
Tank Diameter (ft):							3.3000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							32.0439			

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

T-502 Rev1 2 26 09 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Acid	Jul	71.26	65.04	77.47	64.33	0.6300	0.6300	0.6300	18.8600			0.00	

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

Identification

User Identification:	T-502 Rev1 2 26 09
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		7.67
Diameter (ft):		3.30
Volume (gallons):		487.00
Turnovers:		16,509.24
Net Throughput(gal/yr):		8,040,000.00
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

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

	PM/PM10/HF
lb/hr	
Uncontr.	0.02
Contr.	0.001
lb/day	
Uncontr.	0.47
Contr.	0.02
lb/yr (Contr.)	8.51

	50 m Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF.since it has higher vapor pressure than others. For risk screening, we use HNO_3 hourly emission and H_2SO_4 annual emission.

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	-	8.51	-	86.70	-	0.10	Yes
HNO_3	0.001	-	0.0857	-	0.01	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.011	0.10	

Monthly throughput limit: 487 gals*16509 times/yr/12 months/yr*1 = 670,000 gals/month

ATTACMENT
WASTE ACIDS
T-502
Rectangular
Control: 483796/492808

Previous:	None	-		A/N:	460713
Given:					
Dimensions:	ft	inches	gals		
W	4	3	487		
L	7	8		Convert to	
H	2	0		Horizontal	
Tank diameter (Used for calculations)*			D	3.3	ft
Tank length (Used for calculations)			L	7.67	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Working volume				487	gals
Desired thoughput:				8,040,000	gals/yr
Turnovers per year				16,509	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure				0.635	psia
Maximum emissions**					
Working				31.93	lb/month
Breathing				0.11	lb/month
Note: **From TANK 4.0.9d Emissions Report				32.04	
Weight% of acid in vapor:				45.24%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
(Cushion factor is used to give a cushion on the limit to insure compliance)					

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(31.93 + 0.11) lb/month =	32.04	lb/month
PM/PM10/HCl			
lb/day			
Uncontrolled	32.04 lb/month/31 days/month*0.4524*1 =	0.47	lb/day
Controlled	0.47 lb/day*(1-0.95) =	0.02	lb/day
lb/hr			
Uncontrolled	0.47 lb/day/24 hrs/day =	0.019	lb/hr
Controlled	0.02 lb/day/24 hrs/day =	0.001	lb/hr
lb/yr	0.02 lb/day*7 days/wk*52 wks/yr =	8.51	lb/yr

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

Emissions Report for: July

T-501 Rev1 2 26 09 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Sulfuric Acid	28.05	0.07	28.12

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

T-501 Rev1 2 26 09 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0712			
Vapor Space Volume (cu ft):							30.8888			
Vapor Density (lb/cu ft):							0.0018			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9517			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							30.8888			
Tank Diameter (ft):							3.3000			
Effective Diameter (ft):							4.8822			
Vapor Space Outage (ft):							1.6500			
Tank Shell Length (ft):							5.6700			
Vapor Density										
Vapor Density (lb/cu ft):							0.0018			
Vapor Molecular Weight (lb/lb-mole):							18.0400			
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):							523.9983			
Tank Paint Solar Absorptance (Shell):							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):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9517			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.5800			
Vapor Space Outage (ft):							1.6500			
Working Losses (lb):							28.0524			
Vapor Molecular Weight (lb/lb-mole):							18.0400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800			
Net Throughput (gal/mo.):							670,000.0000			
Annual Turnovers:							21,440.0000			
Turnover Factor:							0.1681			
Tank Diameter (ft):							3.3000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							28.1236			

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

T-501 Rev1 2 26 09 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Sulfuric Acid	Jul	71.26	65.04	77.47	64.33	0.5800	0.5800	0.5800	18.0400			0.00	

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

Identification

User Identification:	T-501 Rev1 2 26 09
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	5.67
Diameter (ft):	3.30
Volume (gallons):	375.00
Turnovers:	21,440.00
Net Throughput(gal/yr):	8,040,000.00
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

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

Previous: None - A/N: 460712

Mixture Vapor Pressure
WASTE SULFURIC ACID
T-501

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP mmHg	moles fraction	Weight Contribution	Wt% w/ water	Wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
H_2SO_4	10	10.00%	98.07	0.00547	0.00029	0.029	0.16%	100%
Water	90	90%	18.02	18.8	1.00	18.02	99.84%	0%
	100	100%		18.82	1.00	18.04	100%	100%
			psia	0.36		w/o water	0.16%	

Desired throughput 670,000 gals/month
8,040,000 gals/yr

	PM/PM10/HF
lb/hr	
Uncontr.	5.97E-05
Contr.	2.99E-06
lb/day	
Uncontr.	1.43E-03
Contr.	7.17E-05
lb/yr (Contr.)	0.026097

Rule 1401:
HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	2.99E-06	2.61E-02	1.20E-01	-	2.49E-05	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					2.49E-05	-	

Monthly throughput limit: 375 gals*21440 times/yr/12 months/yr*1 = 670,000 gals/month

ATTACMENT
WASTE SULFURIC ACID
T-501
Rectangular
Control: 483796/492808

Previous:	None			A/N:	460712
Given:					
Dimensions:	ft	inches	gals		
W	4	3	487		
L	7	8		Convert to	
H	2	0		Horizontal	
Tank diameter (Used for calculations)*			D	3.3	ft
Tank length (Used for calculations)			L	7.67	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Working volume				375	gals
Desired thoughput:				8,040,000	gals/yr
Turnovers per year				21,440	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure				0.364	psia
Maximum emissions**					
Working				28.05	lb/month
Breathing				0.07	lb/month
Note: **From TANK 4.0.9d Emissions Report					
Weight% of acid in vapor:				0.16%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
(Cushion factor is used to give a cushion on the limit to insure compliance)					

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(28.05 + 0.07) lb/month =	28.12	lb/month
PM/PM10/HCl			
lb/day			
Uncontrolled	28.12 lb/month/31 days/month*0.0016*1 =	0.0014339	lb/day
Controlled	0.0014339 lb/day*(1-0.95) =	0.00007169	lb/day
lb/hr			
Uncontrolled	0.0014339 lb/day/24 hrs/day =	0.000059746	lb/hr
Controlled	0.000071695 lb/day/24 hrs/day =	0.0000029873	lb/hr
lb/yr	0.000071695 lb/day*7 days/wk*52 wks/yr =	0.026097	lb/yr

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

Emissions Report for: July

T-511 Rev1 2 26 09 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Acids	0.26	0.06	0.32

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

T-511 Rev1 2 26 09 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0590			
Vapor Space Volume (cu ft):							22.5114			
Vapor Density (lb/cu ft):							0.0021			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9523			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							22.5114			
Tank Diameter (ft):							3.0000			
Effective Diameter (ft):							4.3713			
Vapor Space Outage (ft):							1.5000			
Tank Shell Length (ft):							5.0000			
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):							530.9285			
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/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):							0.6300			
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):							530.9285			
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:							0.9523			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.6300			
Vapor Space Outage (ft):							1.5000			
Working Losses (lb):							0.2567			
Vapor Molecular Weight (lb/lb-mole):							18.8600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6300			
Net Throughput (gal/mo.):							4,500.0000			
Annual Turnovers:							857.1429			
Turnover Factor:							0.2017			
Tank Diameter (ft):							3.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.3157			

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

T-511 Rev1 2 26 09 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Acids	Jul	71.26	65.04	77.47	64.33	0.6300	0.6300	0.6300	18.8600			0.00	

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

Identification

User Identification:	T-511 Rev1 2 26 09
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):		5.00
Diameter (ft):		3.00
Volume (gallons):		63.00
Turnovers:		857.14
Net Throughput(gal/yr):		54,000.00
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

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

	PM/PM10/Acid
lb/hr	
Uncontr.	0.0002
Contr.	0.0002
lb/day	
Uncontr.	0.005
Contr.	0.005
lb/yr (Contr.)	1.70

	50 m	
	Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF.since it has higher vapor pressure than others. For risk screening, we use HNO_3 hourly emission and H_2SO_4 annual emission.

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	-	1.70	-	86.70	-	0.02	Yes
HNO_3	0.000	-	0.0857	-	0.00	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.00	0.02	

Monthly throughput limit: 63 gals*8544 times/yr/12 months/yr*1 = 45,000 gals/month

ATTACMENT
WASTE ACIDS
T-511
Rectangular
Control: None

Previous:	None			A/N:	460711
Dimensions:	ft	inches	gals		
W	1	8	63		
L	3	0.5		Convert to	
H	1	8		Horizontal	
Tank diameter (Used for calculations)*			D	1.9	ft
Tank length (Used for calculations)			L	3.04	ft

*Diameter of a circle whose area is equal to the surface cross section area.

Working volume	63	gals
Desired thoughput:	540,000	gals/yr
Turnovers per year	8,544	
Month selected for emission calculations:	July	
Number of days in July:	31	
Total pressure:	0.63	psia
Maximum emissions**		
Working	0.26	lb/month
Breathing	0.06	lb/month
Note: **From TANK 4.0.9d Emissions Report	0.32	
Weight% of acid in vapor:	45.24%	
Control efficiency:	0%	
Operating Schedule:		
hrs/day	24	hrs/day
days/wk	7	days/wk
weeks/yr	52	wks/yr
PM10 in PM	100%	
Cushion factor:	1.0	

(Cushion factor is used to give a cushion on the limit to insure compliance)

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.26 + 0.06) lb/month =	0.32	lb/month
PM/PM10/Acid			
lb/day			
Uncontrolled	0.32 lb/month/31 days/month*0.4524*1 =	0.005	lb/day
Controlled	0.005 lb/day*(1-0) =	0.005	lb/day
lb/hr			
Uncontrolled	0.005 lb/day/24 hrs/day =	0.000	lb/hr
Controlled	0.005 lb/day/24 hrs/day =	0.000	lb/hr
lb/yr	0.005 lb/day*7 days/wk*52 wks/yr =	1.70	lb/yr

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

Emissions Report for: July

T-408 2 26 09 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Scale Inhibitor	0.03	0.01	0.04

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

T-408 2 26 09 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0093			
Vapor Space Volume (cu ft):							4.3580			
Vapor Density (lb/cu ft):							0.0017			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9742			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							4.3580			
Tank Diameter (ft):							2.0000			
Vapor Space Outage (ft):							1.3872			
Tank Shell Height (ft):							2.5000			
Average Liquid Height (ft):							1.2500			
Roof Outage (ft):							0.1372			
Roof Outage (Dome Roof)										
Roof Outage (ft):							0.1372			
Dome Radius (ft):							2.0000			
Shell Radius (ft):							1.0000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0017			
Vapor Molecular Weight (lb/lb-mole):							26.1400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3600			
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			
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):							0.3600			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.3600			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.3600			
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:							0.9742			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.3600			
Vapor Space Outage (ft):							1.3872			
Working Losses (lb):							0.0336			
Vapor Molecular Weight (lb/lb-mole):							26.1400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3600			
Net Throughput (gal/mo.):							150.0000			
Annual Turnovers:							30.5085			
Turnover Factor:							1.0000			
Maximum Liquid Volume (gal):							59.0000			
Maximum Liquid Height (ft):							2.5000			
Tank Diameter (ft):							2.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.0429			

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

T-408 2 26 09 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Scale Inhibitor	Jul	71.26	65.04	77.47	64.33	0.3600	0.3600	0.3600	26.1400			0.00	

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

Identification

User Identification:	T-408 2 26 09
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):	2.50
Diameter (ft):	2.00
Liquid Height (ft) :	2.50
Avg. Liquid Height (ft):	1.25
Volume (gallons):	59.00
Turnovers:	30.51
Net Throughput(gal/yr):	1,800.00
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

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

Previous: None A/N: 460709

Mixture Vapor Pressure
SCALE INHIBITOR
T-408

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP* mmHg	moles fraction	Weight Contribution	Wt% w/ water	Wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
H_3PO_4	10	10%	98.00	0.03	0.0015908	0.16	0.86%	81%
H_2SO_4	10	10%	98.07	0.00547	0.0002902	0.03	0.16%	15%
HCl	10	10%	36.46	0.004	0.0002255	0.01	0.05%	4%
Water	70	70%	18.02	18.8	0.9978935	17.98	98.94%	-
	100	100%		18.86	1.0000	18.1698	100%	100%
			psia	0.36		w/o water	1.1%	

Desired throughput 150 gals/month
1,800 gals/yr

Vapor pressure of 90% H2SO4 is used.

lb/yr	80.95%*0 =	0.00403 lb/yr
H_2SO_4		
lb/day		
Uncontrolled	14.78%*0 =	2.02E-06 lb/day
Controlled	14.78%*0 =	2.02E-06 lb/day
lb/hr		
Uncontrolled	14.78%*0 =	8.42E-08 lb/hr
Controlled	14.78%*0 =	8.42E-08 lb/hr
lb/yr	14.78%*0 =	0.000736 lb/yr
HCl		
lb/day		
Uncontrolled	4.27%*0 =	5.84E-07 lb/day
Controlled	4.27%*0 =	5.84E-07 lb/day
lb/hr		
Uncontrolled	4.27%*0 =	2.43E-08 lb/hr
Controlled	4.27%*0 =	2.43E-08 lb/hr
lb/yr	4.27%*0 =	0.00 lb/yr

	PM/PM10	H_3PO_4	H_2SO_4	HCl
lb/hr				
Uncontr.	5.70E-07	4.61E-07	8.42E-08	2.43E-08
Contr.	5.70E-07	4.61E-07	8.42E-08	2.43E-08
lb/day				
Uncontr.	0.00001	1.11E-05	2.02E-06	0.000001
Contr.	0.00001	1.11E-05	2.02E-06	0.000001
lb/yr (Contr.)	0.005	0.00403	0.000736	0.0002

	50 m	
	Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_3PO_4	4.61E-07	4.03E-03	-	607.00	-	6.64E-06	Yes
H_2SO_4	8.42E-08	7.36E-04	0.12	86.70	7.02E-07	8.49E-06	
HCl	2.43E-08	0.00	2.10	780.00	1.16E-08	2.72E-07	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					7.13E-07	1.54E-05	

Monthly throughput limit: 150 gals/month

ATTACMENT
SCALE INHIBITOR
T-408
Vertical
Control: None

Previous:	None			A/N:	460709
Given:					
Tank dimentior	ft	in	gals		
DIA.	2	0	59		
L	2	6			
Working volume				50	gals
Desired thoughput:				1,800	gals/yr
Turnovers per year				36.00	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure:				0.36	psia
Maximum emissions**					
Working				0.03	lb/month
Breathing				0.01	lb/month
Note: **From TANK 4.0.9d Emissions Report				0.04	
Weight% of PM in vapor:				1.06%	
Acids in PM:					
H_3PO_4				80.95%	
H_2SO_4				14.78%	
HCl				4.27%	
Control efficiency:				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	

(Cushion factor is used to give a cushion on the limit to insure compliance)

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.03 + 0.01) lb/month =	0.04	lb/month
PM/PM10			
lb/day			
Uncontrolled	0.04 lb/month/31 days/month*0.0106*1 =	0.000	lb/day
Controlled	0 lb/day*(1-0) =	0.000	lb/day
lb/hr			
Uncontrolled	0 lb/day/24 hrs/day =	0.00000	lb/hr
Controlled	0 lb/day/24 hrs/day =	0.00000	lb/hr
lb/yr	0 lb/day*7 days/wk*52 wks/yr =	0.00	lb/yr
H_3PO_4			
lb/day			
Uncontrolled	80.95%*0 =	1.11E-05	lb/day
Controlled	80.95%*0 =	1.11E-05	lb/day
lb/hr			
Uncontrolled	80.95%*0 =	4.61E-07	lb/hr
Controlled	80.95%*0 =	4.61E-07	lb/hr