AIR DISPERSION MODELING SUMMARY SHEET

COMPANY/FACILITY: AVX Corporation
LOCATION (COUNTY): Myrtle Beach (Horry County) **DATE:** 7/17/2009
PERMIT NUMBER: 1340-0002 **REVIEWED BY:** JPG

REQUEST:	____	**CONSTRUCTION PERMIT**	____	**CONDITIONAL MAJOR**
	____	**NEW OPERATING PERMIT**	____	**TITLE V PERMIT**
	____	**OPERATING PERMIT RENEWAL**	____	**TITLE V OPFLEX**
	X	**AIR COMPLIANCE DEMO**	____	**PSD MAJOR**
MODELED FOR:	____	**AAQS**	____	**PSD INCREMENT**
	X	**AIR TOXICS**	X	**DE MINIMIS**
OTHER:	____	**EXEMPTION**	____	**DEFERRAL**
			No	**COLLOCATED (Yes or No)**

PROJECT DESCRIPTION: Facility is requesting permission to replace the two old air strippers with a new air stripper located away from demolition operations. SCREEN3 modeling passed for vinyl chloride. All other Std. 8 emissions are de minimis.

SUMMARY OF MODELING ANALYSIS & RESULTS: SCREEN3 modeling was submitted by Resolute Env., Inc. that added previous vinyl chloride results to results for the new stripper. This modeling passed for vinyl chloride. All other Std. 8 emissions are de minimis. This is a complete modeling summary sheet with changes listed in **bold**.

STANDARD NO. 2 - AMBIENT AIR QUALITY STANDARDS MODELING ANALYSIS

Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total ($\mu g/m^3$)	Standard ($\mu g/m^3$)	% of Standard
TSP	Annual	SCREEN3	18.7	26.5	45.2	75	60.3%
PM_{10}	24 Hour	AERMOD	42.37	37.0	79.37	150	52.9%
	Annual	AERMOD	10.18	17.2	27.38	50	54.8%
SO_2	3 Hour	SCREEN3	0.719	52.4	53.12	1300	4.1%
	24 Hour	SCREEN3	0.320	18.3	18.62	365	5.1%
	Annual	SCREEN3	0.04	4.5	4.54	80	5.7%
NO_2	Annual	SCREEN3	6.045	4.0	10.05	100	10.0%
CO	1 Hour	SCREEN3	100.489	687.0	787.49	40,000	2.0%
	8 Hour	SCREEN3	70.342	344.0	414.34	10,000	4.1%
Lead	Quarterly	SCREEN3	1.286	0.002	1.29	1.5	85.9%
Gaseous Fluorides	12 Hour	SCREEN3	0.161	*	0.161	3.7	4.35%
	24 Hour	SCREEN3	0.107	*	0.107	2.9	3.69%
	Weekly	SCREEN3	*	*	*	1.6	*
	Monthly	SCREEN3	*	*	*	0.8	*

The 1st high modeled concentration was used for Annual Averaging Time and 2nd high was used for all other averaging periods.
*Data is not available.

BACKGROUND MONITORING DATA ($\mu g/m^3$)									
Pollutant	**Site Name**	**County**	**Year**	**1-Hr**	**3-Hr**	**8-Hr**	**24-Hr**	**Qtr**	**Annual**
TSP	Myrtle Beach	Horry	2006						26.5
PM_{10}	Cape Romain	Charleston	2006				37		17.2
SO_2	Cape Romain	Charleston	2006		52.4		18.3		4.5
NO_2	Cape Romain	Charleston	2006						4.0
CO	Cape Romain	Charleston	2006	687		344			
Pb	Myrtle Beach	Horry	2006					0.002	
Mean was used for Annual Averaging Time and 2nd high was used for all other averaging periods. Pb is the highest of the four quarters.									

STANDARD NO. 8 - TOXIC AIR POLLUTANTS MODELING ANALYSIS					
POLLUTANT	**CAS NUMBER**	**MODEL USED**	**MAXIMUM MODELED CONCENTRATION ($\mu g/m^3$)**	**STANDARD ($\mu g/m^3$)**	**% OF STANDARD**
Dibutylphthalate	84-74-2	SCREEN3	9.216	25.00	37
MIBK	108-10-1	SCREEN3	399.067	2050.00	20
Nickel	7440-02-0	SCREEN3	0.39	0.50	78
Xylene	1330-20-7	SCREEN3	591.29	4350.0	13
Vinyl Chloride	**75-01-4**	**SCREEN3**	**36.99**	**50.00**	**74**

STANDARD NO. 8 – TOXIC AIR POLLUTANTS LEVEL I DE MINIMIS ANALYSIS				
POLLUTANT	**CAS NUMBER**	**EMISSION RATE (LBS/DAY)**	**DE MINIMIS (LBS/DAY)**	**PASS (Y or N)**
Benzene	**71-43-2**	**0.38**	**1.800**	**Yes**
Carbon Disulfide	**75-15-0**	**0.38**	**1.800**	**Yes**
Catechol	120-80-9	1.12E-14	3.564	Yes
Chlorobenzene	**108-90-7**	**0.38**	**20.700**	**Yes**
Chloroform	**67-66-3**	**0.38**	**3.000**	**Yes**
Chromium +6 Compounds	N/A	4.1E-05	0.03	Yes
2-Ethanolamine	141-43-5	1.25	2.4	Yes
Ethyl Benzene	100-41-4	**0.44**	52.2	Yes
Ethyl Chloride	**75-00-3**	**0.38**	**316.800**	**Yes**
Ethylene Dichloride	**107-06-2**	**0.33**	**2.400**	**Yes**
Ethylidene Dichloride	**75-34-3**	**0.38**	**24.300**	**Yes**
Formaldehyde	50-00-0	1.57E-14	0.18	Yes
Glycol Ethers	N/A	4.08	N/A	Yes
HCl	7647-01-0	0.022	2.1	Yes
Manganese Compounds	N/A	0.0026	0.30	Yes
Methyl Alcohol	67-56-1	15.50	15.72	Yes

Methylene Chloride	**75-09-2**	**1.92**	**105.000**	**Yes**
Methyl Ethyl Ketone	**78-93-3**	**0.55**	**177.000**	**Yes**
Naphthalene	**91-20-3**	**0.23**	**15.000**	**Yes**
Nitric Acid	7697-37-2	0.093	1.50	Yes
Phosphoric Acid	7664-38-2	0.038	0.300	Yes
Sodium Hydroxide	1310-73-2	0.134	0.600	Yes
Styrene	**100-42-5**	**0.38**	**63.900**	**Yes**
Sulfuric Acid	7664-93-9	0.017	0.120	Yes
Tetrachloroethylene	**127-18-4**	**0.38**	**40.200**	**Yes**
Toluene	108-88-3	**0.52**	24.0	Yes
1,1,2-Trichloroethane	**79-00-5**	**0.38**	**3.276**	**Yes**
1,2,4-Trichlorobenzene	**120-82-1**	**0.32**	**4.800**	**Yes**
Trichloroethylene	79-01-6	**7.21**	81.000	Yes
Vinyl Chloride	75-01-4	**2.16**	0.600	**No**
Vinylidene Chloride	**75-35-4**	**0.38**	**1.188**	**Yes**
o-Xylene	**95.47-6**	**0.05**	**52.200**	**Yes**
p-Xylene	**108-38-3**	**0.05**	**52.200**	**Yes**

STANDARD NO. 2 - MODELED AAQS EMISSION RATES (LBS/HR)					
STACK ID	**TSP**	**PM_{10}**	**SO_2**	**NO_2**	**CO**
Equip ID 01-B	0.082	--	--	--	--
Equip ID 02-A	0.084	--	--	--	--
Equip ID 02-B	0.022	--	--	--	--
Equip ID 02-C	0.0418	--	--	--	--
Equip ID 03-C	0.1272	0.137*	0.01	1.674	1.4602
Equip ID 03-E	0.003	--	--	--	--
Equip ID 06-A	3.3E-06	--	--	--	--
Equip ID 06-B	2.71E-05	--	--	--	--
Equip ID 08	1.74E-03	0.51*	--	--	--
FACILITY TOTAL	0.3618	0.647	0.01	1.674	1.4602

***Worst Case Stacks modeled for PM10 emissions in AERMOD.**

STANDARD NO. 2 - MODELED AAQS EMISSION RATES (LBS/HR)		
STACK ID	**HF**	**LEAD**
Equip ID 02-A	--	0.0136
Equip ID 02-C	--	6.84E-03
Equip ID 03-E	--	0.052
Equip ID 13	0.018	6.67E-05
FACILITY TOTAL	0.018	0.073

STANDARD NO. 8 - MODELED AIR TOXIC EMISSION RATES TABLE 1 (LBS/HR)				
STACK ID	**Nickel**	**Dibutylphthalate**	**Xylene**	**HCl**
	7440-02-0	**84-74-2**	**1330-20-7**	**7647-01-0**
Equip ID 01-A	--	--	0.29	--
Equip ID 01-B	--	--	1.16	--
Equip ID 02-A	0.035	--	--	--
Equip ID 05	--	--	0.513	--
Stack ID 12D-1	--	0.06	--	--
Equip ID 13	--	--	--	9.18E-04
FACILITY TOTAL	0.035	0.06	1.963	9.18E-04

STANDARD NO. 8 - MODELED AIR TOXIC EMISSION RATES TABLE 2 (LBS/HR)				
STACK ID	**Sulfuric Acid**	**Nitric Acid**	**Phosphoric Acid**	**2-Ethanolamine**
	7664-93-9	**7697-37-2**	**7664-38-2**	**414-43-5**
Equip ID 13	7.21E-04	3.88E-03	1.59E-03	5.19E-02
FACILITY TOTAL	7.21E-04	3.88E-03	1.59E-03	5.19E-02

STANDARD NO. 8 - MODELED AIR TOXIC EMISSION RATES TABLE 3 (LBS/HR)				
STACK ID	**Ethylidene Dichloride**	**Methyl Alcohol**	**MIBK**	**Trichloroethylene**
	75-34-3	**67-56-1**	**108-10-1**	**79-01-6**
Equip ID 01-A	--	0.01	2.73E-03	--
Equip ID 01-B	--	0.02	0.011	--
ID10-LVCMAP Machine	--	0.005	0.004	--
~~**Equip ID 03-A***~~	~~**2.2E-03***~~	~~**--**~~	~~**--**~~	~~**0.274***~~
Equip ID 03-B	--	0.0023	7.24E-04	--
Equip ID 03-D	--	3.63E-04	1.97E-04	--
Equip ID 04	--	8.13E-04	4.29E-04	--
Equip ID 05	--	--	9.1E-03	--
Equip ID 07	--	0.22	0.13	--
Equip ID 09	--	3.2E-03	1.67E-03	--
Equip ID 10	--	0.383	0.324	--
Equip ID 12	--	1.53E-03	8.13E-04	--
FACILITY TOTAL	~~2.2E-03~~	0.646	0.485	~~0.274~~

***Replaced by New Stripper; these emissions are de minimis but will remain in table until such time as facility updates facility-wide modeling.**

STANDARD NO. 8 - MODELED AIR TOXIC EMISSION RATES TABLE 4 (LBS/HR)				
STACK ID	**Vinyl Chloride**	**Ethyl Benzene**	**Toluene**	**Formaldehyde**
	75-01-4	**100-41-4**	**108-88-3**	**50-00-0**
Equip ID 01-A	--	--	1.16E-3	--
Equip ID 01-B	--	2.32E-03	4.63E-03	--
ID02-SBE Plating Process	--	--	--	6.53 E-16
~~**Equip ID 03-A***~~	~~**0.0159**~~	**--**	**--**	**--**
New Stripper	**0.09013**	**--**	**--**	**--**
FACILITY TOTAL	**0.09013**	2.32E-03	5.79E-03	6.53 E-16
***Replaced by New Stripper**				

STANDARD NO. 8 - MODELED AIR TOXIC EMISSION RATES TABLE 5 (LBS/HR)				
STACK ID	**Catechol**	**Sodium Hydroxide**	**Glycol Ethers**	**Chromium +6**
	120-80-9	**1310-73-2**	**N/A**	
Equip 01-A	--	--	0.03	--
Equip ID 01-B	--	--	0.14	--
ID02-SBE Plating Process	4.616 E-16	5.6 E-3	--	--
Equip ID 03-E	--	--	--	1.7E-06
FACILITY TOTAL	4.616 E-16	5.6 E-3	0.17	1.7E-06

STANDARD NO. 8 - MODELED AIR TOXIC EMISSION RATES TABLE 6 (LBS/HR)				
STACK ID	**Manganese Compounds**			
	N/A			
Equip ID 03-E	1.1E-04			
Equip ID 04	--			
FACILITY TOTAL	1.1E-04			

POINT SOURCE PARAMETERS													
STACK ID	DATE LAST MODELED	LOCATION (UTM)		STACK HEIGHT (FT)	EXIT TEMP. (°F)	EXIT VELOCITY (FT/SEC)	STACK DIAMETER (FT)	DISCHARGE ORIENTATION	RAIN CAP?	BUILDING PARAMETERS			DIST TO PROPERTY LINE (FT)
		EAST (M)	NORTH (M)							HEIGHT (FT)	WIDTH (FT)	LENGTH (FT)	
ID01 Metals Mills: MD2C-1, MD2C-1, MD3C-1 (Equip ID 01-A)	1/2008			22	72	4.1*	0.67	Horizontal	No	36	480	600	145
ID01 Metal Mixers: MD1C-1 (Equip ID 01-B)	1/2008			22	72	4.1*	0.67	Horizontal	No	36	480	600	145
ID02 Auto line Platers for Nickel and Tin/Lead: 7C-2 (Equip ID 02-A)	1/2008			28	75	39.4	3			15	480	600	175
ID02 Manual Gold Plater: 7C-2 (Equip ID 02-B)	1/2008			22	75	39.4	3			15	480	600	175
ID02 RFT Plater #1: 7C-2 (Equip ID 02-C)	1/2008			22	75	39.4	3			15	480	600	175
ID03 MB2 Boiler: MB2-B1 (Equip ID 03-C)	1/2008			35.5	600	15.29	1			24	150	525	420
ID05 Termination Tools :9E-1, 9C-1, 8D-1, 7D-1, 11D-3, 12C-1, 12D-1 (Equip ID 05-A)	1/2008			14	160	1.3	0.333			42	480	600	295
ID05 Termination Ovens:9E-1, 9C-1, 8D-1, 7D-1, 11D-3, 12C-1, 12D-1 (Equip ID 05-B)	1/2008			14	160	1.3	0.333			42	480	600	295
ID07 CMAP Machines: 2K-1, 2K-2, 2J-1, 2J-2, 2L-1, 2L-2, 3L-2, 4J-1, 4K-1, 4K-2, 5L-1, 5L-2 (Equip ID 07)	1/2008			17	75	0.033	0.5			15	150	600	250
ID08 MB1-CMAP: IH-1, 1H-2, 1H-3, 2I-1 (Equip ID 08)	1/2008			14	75	0.033	0.5			22	480	600	275
ID13 Thin Film Process: MB2-TFS (Equip ID TFP)	1/2008			43	75	68	1.7			24	150	525	520
New Stripper	**7/2009**			**25**	**68**	**114.6**	**0.33**	**Vertical**	**No**	**31.5**	**71.5**	**125**	**83**

*0.0328 ft/sec used in SCREEN3 model. 1/2008

****ID09 Kiln Room Ovens**: 2H-1, 2I-1, 3H-1, 3H-2, 3H-3, 4H-1, 4H-2, 4I-1, 4K-2, 5D-1, 5H-2, 5I-1, 5J-1, 5K-1, 5K-2, 6H-1, 6I-1, 6I-2, 6I-4, 6I-5, 6I-6, 6J-1, 6J-2, 6J-3, 6J-4, 6K-1, 6K-2, 6K-3, 7I-1, 7I-2, 7I-3, 7I-4, 7J-1, 7J-2, 7J-3, 7K-1, 8I-1, 8I-2, 8J-1, 21G-1 (Equip ID 09-A)

*****ID09 HA Kilns**: 2H-1, 2I-1, 3H-1, 3H-2, 3H-3, 4H-1, 4H-2, 4I-1, 4K-2, 5D-1, 5H-2, 5I-1, 5J-1, 5K-1, 5K-2, 6H-1, 6I-1, 6I-2, 6I-4, 6I-5, 6I-6, 6J-1, 6J-2, 6J-3, 6J-4, 6K-1, 6K-2, 6K-3, 7I-1, 7I-2, 7I-3, 7I-4, 7J-1, 7J-2, 7J-3, 7K-1, 8I-1, 8I-2, 8J-1, 21G-1 (Equip ID 09-B)

Worst Case Stacks were used in SCREEN3/AERMOD modeling. 1/2008

AERMOD SPECIFICATIONS TABLE							
MET DATA	Charleston 1987-1991						
DEM QUADS	Surfside Beach, Myrtle Beach, Nixonville						
PROJECTION DATUM	NAD27	X	NAD83		WGS-84		NWS-84	
RURAL or URBAN?	Rural	X	Urban				
ELEVATIONS EXTRACTED	Buildings	Yes	Sources	Yes	Tanks	No	Receptors	Yes

MODELING HISTORY			
DATE	**MODELED BY**	**REASON MODELED**	**DESCRIPTION**
7/17/09	JPG	Compliance Demo	Facility is requesting permission to replace the two old air strippers with a new air stripper located away from demolition operations. SCREEN3 modeling was submitted by Resolute Env., Inc. that added previous vinyl chloride results to results for the new stripper. This modeling passed for vinyl chloride. All other Std. 8 emissions are de minimis.
1/23/08	MRH	Conditional Major OP	AERMOD modeling completed for PM10 emissions for worst-case stacks. Other Facility-wide pollutants modeled using SCREEN3 for OP.
11/30/07	MRH	C/P	De minimis for Standard No. 8 pollutants, Methyl Alcohol and MIBK.
12/18/07	MRH	C/P	De minimis for Standard No. 8 pollutant, Catechol, Formaldehyde and NaOH.
3/20/07	JPG	Exemption	The installation of a Transguard process line emits less than 1.0 lb/hr of PM and is exempt.
5/28/03	DHH	C/P	This project is to obtain construction permits that reflect the current process and control equipment configurations in the chip manufacturing automated process (CMAP) area.
6/21/02	CHA	Air COMPLIANCE DEMONSTRATION	This project will modify the Nickel Plating System (Stack 7C-2) at the facility by removing the nickel scrubber. SCREEN3 air dispersion modeling analysis was submitted by General Engineering for air toxic pollutants to demonstrate compliance with Standard No. 8.
4/6/01	ALC	Air Demo	Review by the permit engineer revealed discrepancies in emission rates in the Title V application. SCREEN3 Modeling by Trinity Consultants for Nickel, Vinylidene Chloride, Dibutyl Phthalate, and Dioctyl Phthalate. Also, the de minimis table was updated. Sources were modeled using SCREEN3 starting at 1m for the receptor distance. However, the Autoline Plater, the source of Nickel, was modeled starting at 70m (229.6ft) for the receptor distance.
3/6/00	ALC	C/P	Added new equipment.

MODELING HISTORY			
DATE	**MODELED BY**	**REASON MODELED**	**DESCRIPTION**
7/15/98	DGH	C/P	Construction of a new manufacturing facility.
7/15/98	DGH	C/P	Title V (something is obviously wrong with one of these dates, but not sure which one is correct)
4/23/97	CMB	C/P	Construction of two air strippers.
3/8/96	FRD	C/P	Relocation of the Screener/Stacker Process
7/28/95	CKD	C/P	Original modeling.