APPENDIX C

HEALTH RISK ASSESSMENT

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Ultramar Inc.
Valero Wilmington Refinery
SCAQMD Rule 1401 Analysis
New Cogeneration Unit

September 12, 2011

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Ultramar Inc.
Valero Wilmington Refinery
SCAQMD Rule 1401 Analysis
New Cogeneration Unit

FACILITY INFORMATION

The Ultramar Inc. - Valero Wilmington Refinery is located at 2402 East Anaheim Street in the Wilmington district of the City of Los Angeles in the southern portion of Los Angeles County (see Figure 1). The South Coast Air Quality Management District (SCAQMD) identification number for the facility is 800026.

INTRODUCTION

Valero Wilmington Refinery (Refinery) is proposing to build a nominal 31 MW cogeneration unit (Cogen) which includes a natural gas-fired turbine electric generator, a heat recovery steam generator (HRSG) with supplemental duct firing of refinery gas, and the associated air pollution control equipment.

The Refinery currently purchases electricity from Los Angeles Department of Water and Power (LADWP) and relies on steam and electricity from Air Products. Two on-site Refinery boilers also provide 300,000 lb/hr steam at 300 psig. The proposed Cogen project would allow the Refinery to rely mainly on on-site power generation under normal operating conditions as part of an effort to reduce the risk of process upset due to interruption of power supplied by any outside provider. The goal of the project is to offset the LADWP power purchase and supplement the power and steam currently supplied by Air Products.

As part of the permitting process, Environmental Audit Inc. (EAI) has performed a SCAQMD Rule 1401 analysis for the proposed Cogen. EAI has calculated emissions to evaluate the maximum potential impacts of toxic air contaminants (TACs) associated with the Cogen.

Based on information provided by Ultramar, the Cogen has been modeled a point source (Cogen stack) and an area source (fugitive emissions) (See Figure 2). TACs in the emissions from the Cogen are included in the SCAQMD Rule 1401 – New Source Review for Toxic Air Contaminants. The health risks were evaluated using the SCAQMD *Risk Assessment Procedures for Rules 1401 and 212 Version 7.0* (July 2005). The analysis for cancer and non-cancer risks is presented below. The sources are expected to emit 51 chemicals, 33 of which are chemicals listed in Appendix I of the SCAQMD Rule 1401 Guidelines – 20 are considered carcinogens, 23 are considered to have adverse chronic health effects, and 13 are considered to have adverse acute health effects (See Appendix A).

EMISSION ESTIMATES

The emissions estimates of TACs for combustion are calculated using emission factors from the 2010 Annual Emissions Report for the HRSG and the Supplemental Instructions for Reporting Quadrennial Air Toxics Emissions for natural gas turbines. Fugitive emissions are based on the Method 2 of the *SCAQMD Guide for Fugitive Emissions Calculations* (SCAQMD, 2003). The calculated emissions are presented in Appendix B.

HEALTH RISK ASSESSMENT

The California Air Resources Board (CARB) Hotspots Analysis Reporting Program (HARP) model is the most appropriate model for determining the air quality impact from proposed project. The HARP model (CARB, 2005) combines the US EPA Industrial Source Complex dispersion model with a risk calculation model based on the Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003). The dispersion portion of the HARP model provides estimates of source-specific annual and hourly maximum ambient groundlevel concentrations. The risk calculator in the HARP model estimates the cancer risk, chronic index, and acute index values. The model default values were modified to conform to the SCAQMD Supplement Guidelines for Preparing Risk Assessment for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) (SCAQMD, 2005).

The project is modeled as a point source and an area source. The source parameters are listed in Table 1. The locations of the sources were identified based on data provided by Ultramar and the Long Beach USGS Quadrangles (see attached Figure 2).

TABLE 1

Source Parameters

Name	UTME	UTMN	Release Height (ft)	Width (ft)	Length (ft)	Temp (F^o)	Diameter (ft)	Velocity (ft/sec)
Cogen	385407	3738093	95			254.8	9	61.5
Cogen Fugitives	385400	3738070	6	60	150			

The receptors used in the model include a fenceline receptor grid and a fine receptor grid. The terrain surrounding the Facility is relatively flat; however, terrain variations were included for the receptor networks. The fenceline receptor grid (maximal spacing every 50 meters(m)) were used to determine the maximum concentrations at the property line of the Refinery. A fine receptor grid (100 m x 100 m spacing) was used to identify the maximum impact locations. Figure 3 shows all modeled receptors.

All maximum impact locations are verified as credible locations for receptors (i.e., streets, railroad tracks, and waterways are not considered valid receptor locations). The locations of the maximum impacts are then verified for the type of receptor and are reported below. Selected tables from the HARP model are included in Appendix C. The complete output results from the HARP model are on file at the SCAQMD.

CANCER RISK ANALYSIS

The maximum cancer risk for an exposed individual resident (MEIR) is located 1.5 miles east of the Refinery (No. 669, UTM Coordinates 388700, 3738100, See Figure 3). The incremental cancer

risk is 3.86x 10^{-7} or 0.4 in a million at the MEIR. Polycyclic aromatic hydrocarbons (PAHs) contribute approximately 72.5 percent of the calculated cancer risk at the MEIR. The oral pathways accounts for 71.2 percent of the cancer risk. Detailed cancer risk contributions by pathway and pollutants are presented in Appendix C.

The maximum exposed incremental cancer risk at an occupational exposure (MEIW) is located approximately 1,200 feet east of the Refinery (No. 648, UTM Coordinates 386600, 3738100, See Figure 3). The incremental cancer risk is 1.11 x 10^{-7} or 0.1 in a million at the MEIW. PAHs contribute approximately 70 percent of the calculated cancer risk at the MEIW. The oral pathways accounts for 69.2 percent of the cancer risk. Detailed cancer risk contributions by pathway and pollutants are presented in Appendix C.

NON-CANCER RISK ANALYSIS

The maximum chronic hazard index (MCHI) total for the respiratory system is 0.0029. The MCHI is located approximately 1,100 feet east of the Refinery (No. 647, UTM Coordinates 386500, 3738100, See Figure 3). Formaldehyde contributes approximately 42.8 percent of the calculated MCHI. Detailed contribution by pollutant to the chronic hazard index for the maximum receptor location is presented in Appendix C.

The maximum acute hazard index (MAHI) total for the eyes is 0.0157. The MAHI is located approximately 450 feet west of the Refinery (No. 634, UTM 385200, 3738100, See Figure 3). Formaldehyde contributes approximately 61.5 percent of the calculated MAHI. Detailed contribution by pollutant to the acute hazard index for the maximum receptor location is presented in Appendix C.

CONCLUSIONS

The cancer risk for the TACs emitted from the Cogen is below the significance threshold of one per million and chronic and acute hazard indices are below the 1.0 threshold established under SCAQMD Rule 1401. Therefore, the SCAQMD Rule 1401 cancer risk and hazard index thresholds are not expected to be exceeded at any receptor location. No further health risk analyses are required.

REFERENCES

CARB/OEHHA, 2003. *Air Resources Board Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk,* October 2003.

CARB, 2005. *Hotspots Analysis and Reporting Program* HARP Version 1.4a (Build 23.07.00) and resources, http://www.arb.ca.gov/toxics/harp/downloads.htm.

OEHHA, 2003. *Air Toxics Hot Spots Program Risk Assessment Guideline: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment,* August 2003.

SCAQMD, 2008. *Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory*, June 2008.

SCAQMD, 2005. *Supplemental Guidelines for Preparing Risk Assessment for the Air Toxic "Hot Spot" Information and Assessment Act. 2005.*

SCAQMD, 2003. *Guide for Fugitive Emissions Calculations. 2003.*

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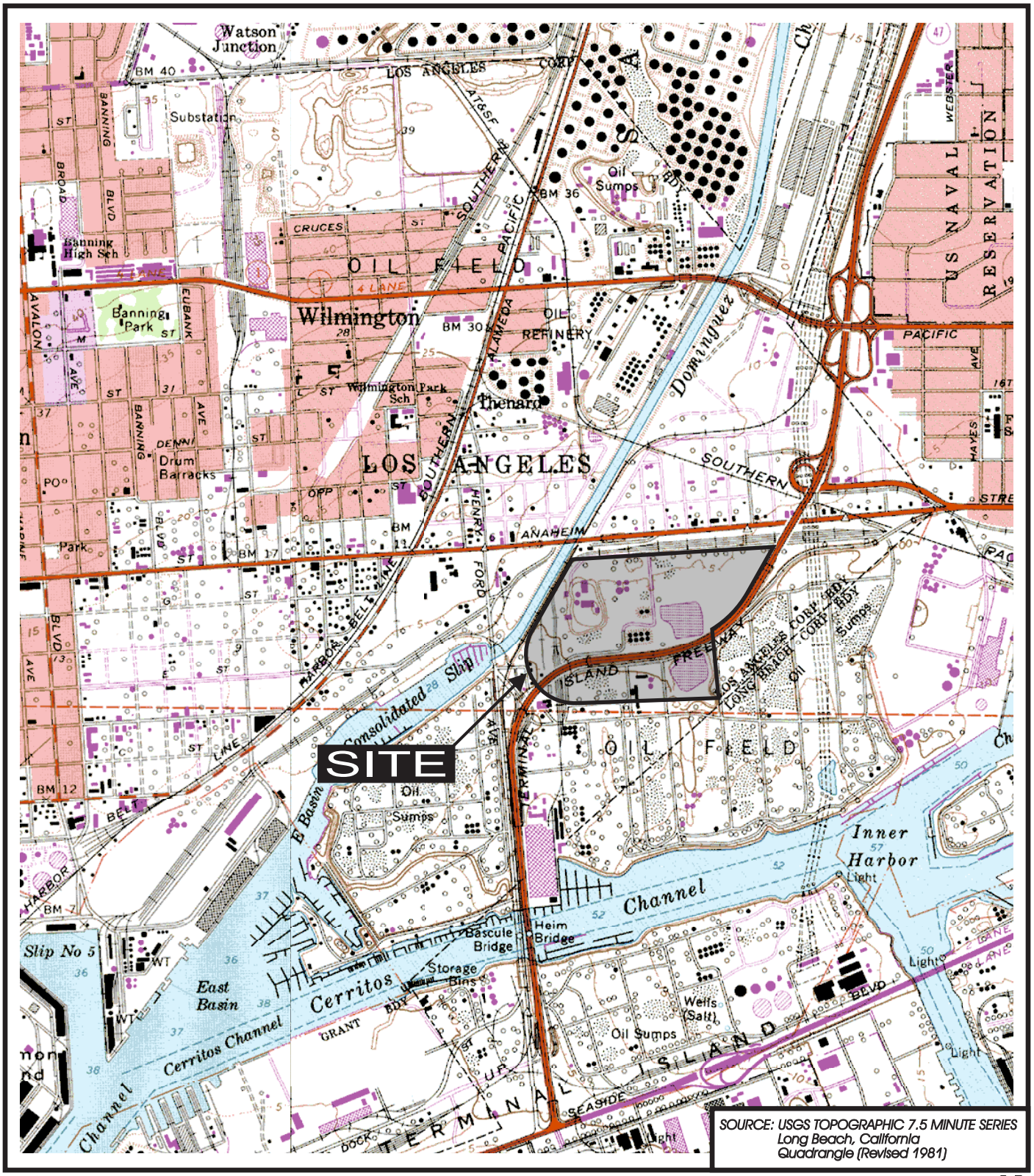
FIGURES



Environmental Audit, Inc.

SITE LOCATION MAP
VALERO WILMINGTON REFINERY

Project No. 2709

Figure 1

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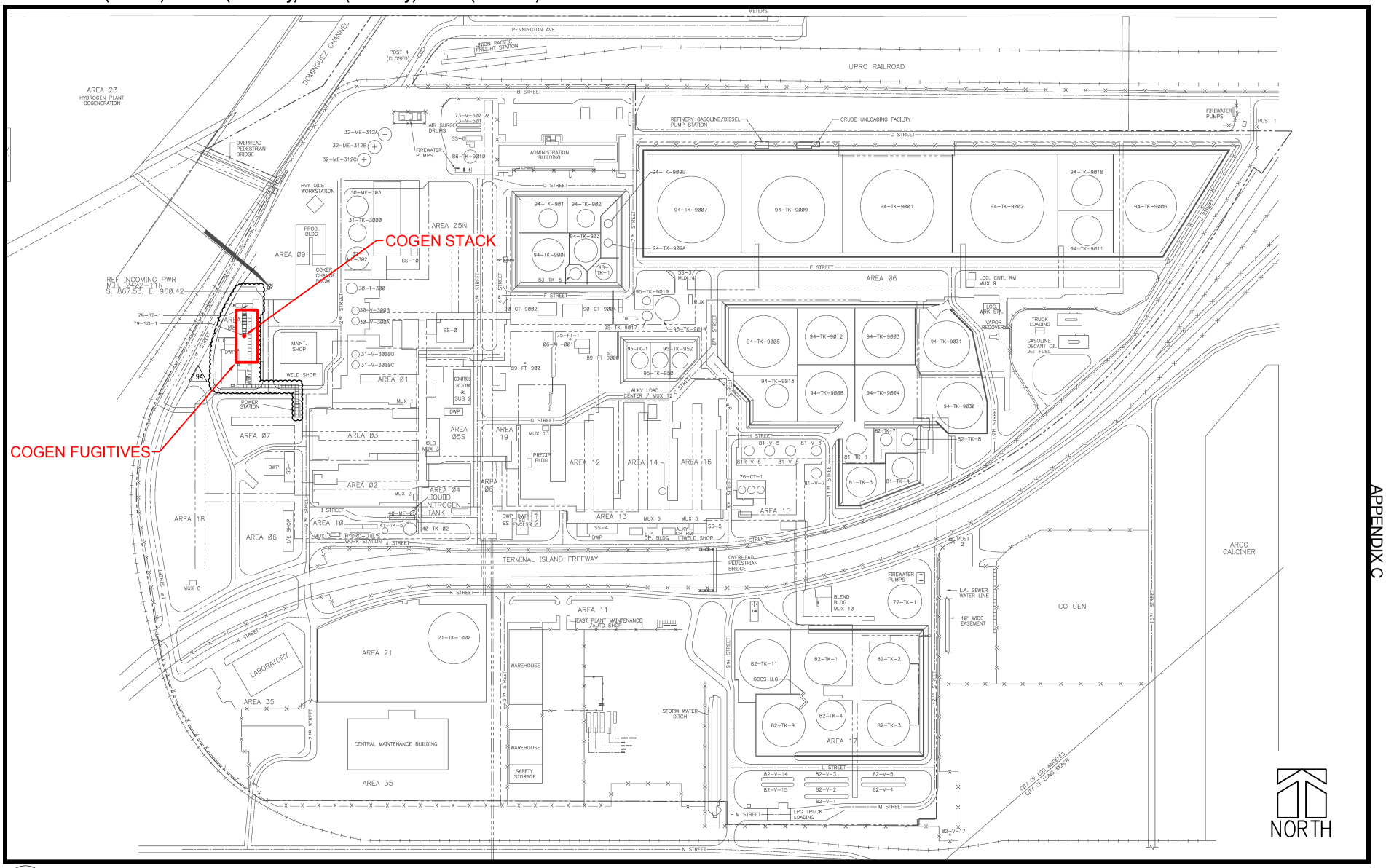

Environmental Audit, Inc.

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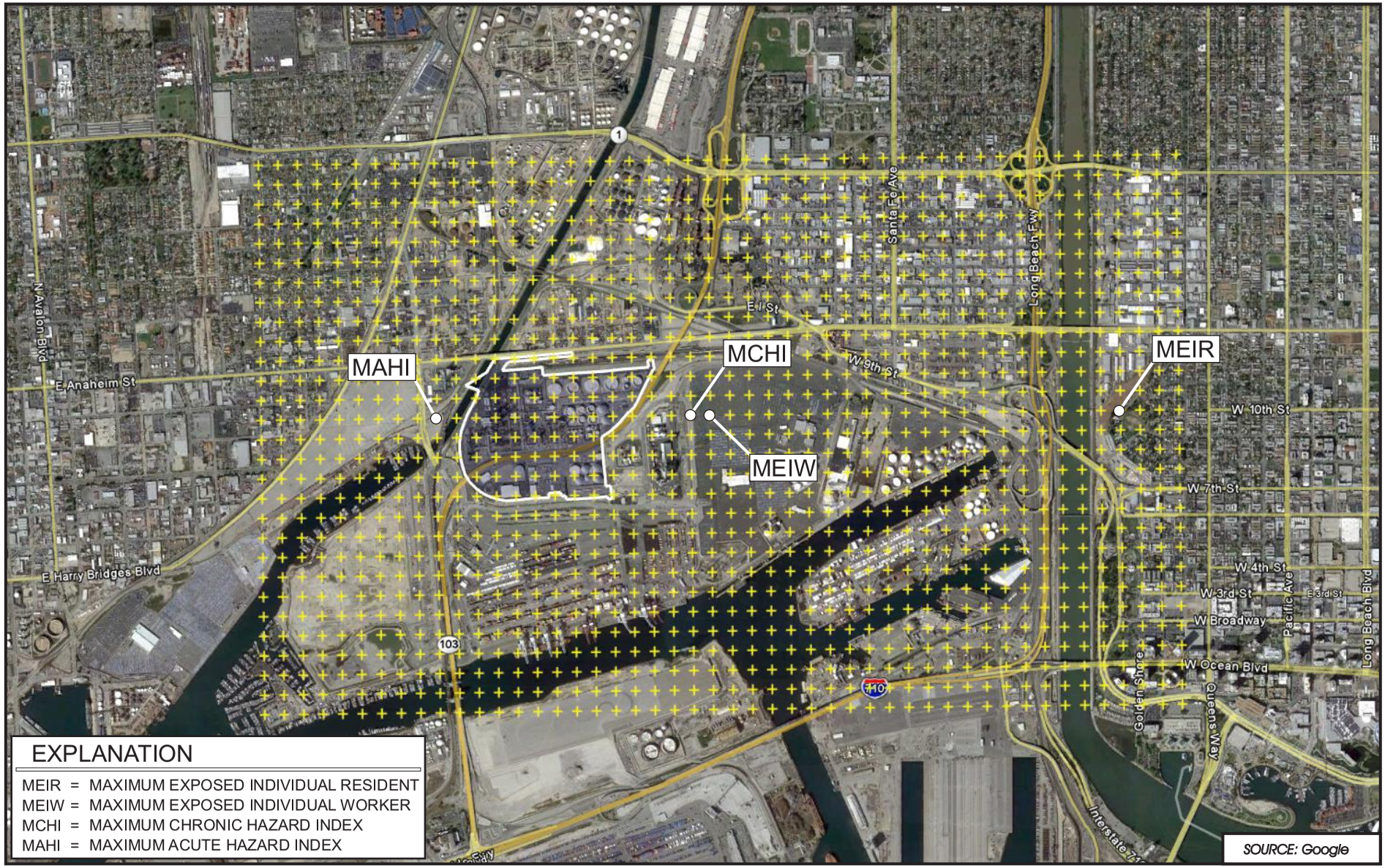
SITE PLAN
VALERO WILMINGTON REFINERY
NEW COGEN



ENVIRONMENTAL AUDIT, INC.

MAXIMUM IMPACT LOCATIONS
VALERO WILMINGTON REFINERY
NEW COGEN

Project No. 2709
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Figure 3
ORIGINAL IN COLOR

APPENDIX A
Emission Calculations

Emission Calculations

Valero Wilmington Refinery
New Cogeneration Unit Stack Emissions

	Emission Factors (lb/mmscf)			HRSG		Turbine		Total Stack Emissions	
Chemical	**Stack Gas**	**RFG**	**NG**	**lb/yr**	**lb/hr**	**lb/yr**	**lb/hr**	**lb/yr**	**lb/hr**
1,3-Butadiene			4.39E-04	0.00E+00	0.00E+00	1.29E+00	1.48E-04	1.29E+00	1.48E-04
2-Methylnaphthalene	6.19E-07			1.06E-02	1.21E-06	0.00E+00	0.00E+00	1.06E-02	1.21E-06
Acenaphthene	6.38E-08			1.09E-03	1.25E-07	0.00E+00	0.00E+00	1.09E-03	1.25E-07
Acenaphthylene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Acetaldehyde	1.04E-02		4.08E-02	1.78E+02	2.03E-02	1.20E+02	1.37E-02	2.98E+02	3.41E-02
Acrolein			6.53E-03	0.00E+00	0.00E+00	1.92E+01	2.19E-03	1.92E+01	2.19E-03
Ammonia				0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E+04	2.71E+00
Anthracene	5.11E-08			8.75E-04	9.99E-08	0.00E+00	0.00E+00	8.75E-04	9.99E-08
Antimony		5.81E-04		7.31E-01	8.35E-05	0.00E+00	0.00E+00	7.31E-01	8.35E-05
Arsenic	5.04E-06			8.63E-02	9.85E-06	0.00E+00	0.00E+00	8.63E-02	9.85E-06
Barium		6.49E-03		8.17E+00	9.32E-04	0.00E+00	0.00E+00	8.17E+00	9.32E-04
Benzene	2.06E-04		1.22E-02	3.52E+00	4.02E-04	3.60E+01	4.11E-03	3.95E+01	4.51E-03
Benzo(a)anthracene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Benzo(a)pyrene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Benzo(b)fluoranthene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Benzo (e) pyrene	2.91E-08			4.99E-04	5.69E-08	0.00E+00	0.00E+00	4.99E-04	5.69E-08
Benzo(g,h,i)perylene	5.44E-07			9.31E-03	1.06E-06	0.00E+00	0.00E+00	9.31E-03	1.06E-06
Benzo(k)fluoranthene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Beryllium	7.53E-07			1.29E-02	1.47E-06	0.00E+00	0.00E+00	1.29E-02	1.47E-06
Cadmium	1.83E-06			3.13E-02	3.57E-06	0.00E+00	0.00E+00	3.13E-02	3.57E-06
Chlorobenzene	2.97E-04			5.08E+00	5.80E-04	0.00E+00	0.00E+00	5.08E+00	5.80E-04
Chromium (Hex)	6.11E-06			1.05E-01	1.19E-05	0.00E+00	0.00E+00	1.05E-01	1.19E-05
Chromium (Total)	1.80E-05			3.09E-01	3.53E-05	0.00E+00	0.00E+00	3.09E-01	3.53E-05
Chrysene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Copper	3.69E-05			6.31E-01	7.21E-05	0.00E+00	0.00E+00	6.31E-01	7.21E-05
Dibenz(a,h)anthracene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Ethylbenzene	2.80E-04		3.26E-02	4.79E+00	5.47E-04	9.60E+01	1.10E-02	1.01E+02	1.15E-02
Fluoranthene	2.84E-07			4.87E-03	5.56E-07	0.00E+00	0.00E+00	4.87E-03	5.56E-07
Fluorene	4.18E-07			7.16E-03	8.17E-07	0.00E+00	0.00E+00	7.16E-03	8.17E-07
Formaldehyde	1.23E-02		7.24E-01	2.11E+02	2.41E-02	2.13E+03	2.43E-01	2.34E+03	2.67E-01
Hydrogen Sulfide	1.80E-02			3.07E+02	3.51E-02	0.00E+00	0.00E+00	3.07E+02	3.51E-02
Indeno(1,2,3-cd)pyrene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Lead	5.59E-05			9.58E-01	1.09E-04	0.00E+00	0.00E+00	9.58E-01	1.09E-04
Manganese	3.91E-05			6.69E-01	7.63E-05	0.00E+00	0.00E+00	6.69E-01	7.63E-05
Mercury	2.58E-05			4.41E-01	5.03E-05	0.00E+00	0.00E+00	4.41E-01	5.03E-05
Naphthalene	7.86E-06		1.33E-03	1.35E-01	1.54E-05	3.92E+00	4.47E-04	4.05E+00	4.62E-04
Nickel	7.65E-05			1.31E+00	1.50E-04	0.00E+00	0.00E+00	1.31E+00	1.50E-04
o-xylenes	2.80E-04			4.79E+00	5.46E-04	0.00E+00	0.00E+00	4.79E+00	5.46E-04
p,m-xylenes	2.80E-04			4.79E+00	5.46E-04	0.00E+00	0.00E+00	4.79E+00	5.46E-04
Perylene	4.18E-08			7.16E-04	8.17E-08	0.00E+00	0.00E+00	7.16E-04	8.17E-08
Phenanthrene	1.25E-06			2.15E-02	2.45E-06	0.00E+00	0.00E+00	2.15E-02	2.45E-06
Phenol	1.18E-02			2.02E+02	2.31E-02	0.00E+00	0.00E+00	2.02E+02	2.31E-02
Phosphorus		7.21E-04		9.07E-01	1.04E-04	0.00E+00	0.00E+00	9.07E-01	1.04E-04
Propylene		2.05E-03	2.96E-02	2.58E+00	2.95E-04	8.71E+01	9.95E-03	8.97E+01	1.02E-02
Pyrene	2.84E-07			4.87E-03	5.56E-07	0.00E+00	0.00E+00	4.87E-03	5.56E-07
Selenium	1.81E-05			3.11E-01	3.54E-05	0.00E+00	0.00E+00	3.11E-01	3.54E-05
Silver		1.81E-03		2.28E+00	2.60E-04	0.00E+00	0.00E+00	2.28E+00	2.60E-04
Thallium		6.49E-03		8.17E+00	9.32E-04	0.00E+00	0.00E+00	8.17E+00	9.32E-04
Toluene	7.79E-04		1.33E-01	1.33E+01	1.52E-03	3.92E+02	4.47E-02	4.05E+02	4.62E-02
Xylene (Total)			6.53E-02	0.00E+00	0.00E+00	1.92E+02	2.19E-02	1.92E+02	2.19E-02
Zinc	1.22E-03			2.09E+01	2.38E-03	0.00E+00	0.00E+00	2.09E+01	2.38E-03
PAHs			9.18E-04	0.00E+00	0.00E+00	2.70E+00	3.09E-04	2.70E+00	3.09E-04

Emission Factors based on R2 AER speciation for RFG.

HRSG = Heat recovery steam generator - Based on 164.5 mmbtu/hr of RFG running 8760 hr/yr.

Turbine based on 352.9 mmbtu/hr of NG running 8760 hr/yr.

Stack Gas = 13.6 * RFG fuel rate. Based on highest ratio of RFG to Stack Gas in past 3 years for all boilers.

RFG = Refinery fuel gas. 1143.6 btu/scf.

NG = Natural gas. 1050 btu/scf.

Ammonia based on 5 ppm.

Worst case assumes no startup/shutdown events.

Appendix A

Emission Calculations

Valero Wilmington Refinery
New Cogeneration Unit Speciated Fugitive Emissions

	RFG Speciation	Molecular wt	Fugitive Emissions	
Chemical	**% volume**	**lb/lb-mol**	**lb/yr**	**lb/hr**
Ammonia	NA	NA	1124.00	0.13
Hexane	0.18%	86.18	20.44	0.00
Hydrogen Sulfide	0.01%	34.08	0.45	0.00
Propylene	2.26%	42.08	125.34	0.01

Note: All fugitive emissions based on Correlation Equation @ 500ppm.

Basis

Ammonia Fugitives	1124	lb/yr
RFG Fugitives	2860	lb/yr
RGF Molecular wt	21.7	lb/lb-mol
RFG Fugitive Mass	132	lb-mol/yr

Appendix A
Valero Wilmington Refinery
New Cogeneration Unit Fugitive Ammonia Emissions

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm)		
						Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All				0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor				4.55	0	-
		Light Liquid (4)			40	4.55	0	181.83
		Heavy Liquid (5)				4.55	0	-
		> 8 inches					0	-
Pumps	Sealless Type	Light Liquid (4)				0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)			4	46.83	-	187.30
	Single Mechanical Seals	Heavy Liquid (5)				46.83	0	
Compressors		Gas / Vapor				9.09	-	
Flanges (ANSI 16.5-1988)		All			108	6.99	-	754.94
Connectors		All				2.86	-	-
Pressure Relief Valves		All			2		0	-
Process Drains with P-Trap or Seal Pot		All			5	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All				9.09	-	
Total Emissions		lb/year					-	1,124
		lbs/day					0	3.12

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

Appendix A
Valero Wilmington Refinery
New Cogeneration Unit Fugitive RFG Emissions

Source Unit		Service	No. Of Existing Components (1)	No. of Existing Components to be Removed (2)	No. of New Components to be Installed (3)	Correlation Equation (CE) Factor (500 ppm) Correlation Equation Factor 500 ppm Screening Value (lbs/year)	Pre Mod Emissions Based on Correlation 500 ppm Screening Value (lbs/year)	Post Modification Emissions based on 500 ppm Correlation Equation Factor (lbs/year)
Valves	Sealed Bellows	All				0.00	0	0
	SCAQMD Approved I&M Program	Gas / Vapor			137	4.55	0	622.77
		Light Liquid (4)				4.55	0	-
		Heavy Liquid (5)				4.55	0	-
		> 8 inches					0	-
Pumps	Sealless Type	Light Liquid (4)				0.00	0	-
	Double Mechanical Seals or Equivalent Seals	Light Liquid (4)				46.83	-	-
	Single Mechanical Seals	Heavy Liquid (5)				46.83	0	
Compressors		Gas / Vapor				9.09	-	
Flanges (ANSI 16.5-1988)		All			320	6.99	-	2,236.86
Connectors		All				2.86	-	-
Pressure Relief Valves		All			8		0	-
Process Drains with P-Trap or Seal Pot		All			6	9.09	-	
Other (including fittings, hatches, sight-glasses, and meters)		All			0	9.09	-	
Total Emissions		lb/year			0		-	2,860
		lbs/day			0		0	7.94

-1 Any component currently installed prior to the modification.

-2 Any component to be removed due to modification.

-3 Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.

-4 Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume. - used single mechanical seal EF

-5 Heavy Liquid: streams with a vapor pressure equal to or less than that of kerosene (< 0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by

-6 Emission Factors were developed using actual emissions for 10 quarters from Q3, 2005 through Q4, 2007 for Cleans Fuel Area and using a factor of 2 to the actual emissions.

APPENDIX B
Health Risk Tables

Health Data

Valero Wilmington Refinery
New Cogeneration Unit

CHEMICAL	CAS NO.	CancerPF (Inhalation) $(mg/kg\text{-}d)^{-1}$	CancerPF (Oral) $(mg/kg\text{-}d)^{-1}$	ChronicREL (Inhalation) $(\mu g/m^3)$	ChronicREL (Oral) (mg/kg-d)	AcuteREL (Inhalation) $(\mu g/m^3)$
1,3-Butadiene	106990	0.6		20		
2-Methyl naphthalene	91576					
Acenaphthene	83329					
Acenaphthylene	208968					
Acetaldehyde	75070	0.01		140		470
Acrolein	107028			0.35		2.5
Ammonia	7664417			200		3200
Anthracene	120127					
Antimony	7440360					
Arsenic	7440382	12	1.50E+00	0.015	0.0000035	0.2
Barium	7440393					
Benz[a]anthracene	56553	0.39	1.20E+00			
Benzene	71432	0.1		60		1300
Benzo[a]pyrene	50328	3.90E+00	1.20E+01			
Benzo[b]fluoranthene	205992	3.90E-01	1.20E+00			
Benzo[e]pyrene	192972					
Benzo[g,h,i]perylene	191242					
Benzo[k]fluoranthene	207089	3.90E-01	1.2			
Beryllium	7440417	8.40E+00		0.007	0.002	
Cadmium	7440439	1.50E+01		0.02	0.0005	
Chlorobenzene	108907			1000		
Chromium	7440473					
Chromium(VI)	18540299	510		2.00E-01	0.02	
Chrysene	218019	3.90E-02	1.20E-01			
Copper	7440508					100
Dibenz[a,h]anthracene	53703	4.10E+00	4.10E+00			
Ethyl benzene	100414	8.70E-03		2.00E+03		
Fluoranthene	206440					
Fluorene	86737					
Formaldehyde	50000	0.021		9		55
Hexane	110543			7.00E+03		
Hydrogen sulfide	7783064			10		42
Indeno[1,2,3-cd]pyrene	193395	3.90E-01	1.20E+00			
Lead	7439921	0.042	8.50E-03			
Manganese	7439965			0.09		
Mercury	7439976			3.00E-02	0.00016	0.6
Naphthalene	91203	0.12		9		
Nickel	7440020	9.10E-01		0.05	0.05	6
PAH	1151	3.90E+00	1.20E+01			
Perylene	198550					
Phenanthrene	85018					
Phenol	108952			200		5800
Phosphorus	7723140					
Propylene	115071			3.00E+03		
Pyrene	129000					
Selenium	7782492			2.00E+01		
Silver	7440224					
Thallium	7440280					
Toluene	108883			300		37000
Xylenes (mixed)	1330207			700		22000
Zinc	7440666					

PF = Potency Factor
REL = Reference Exposure Limit
Source: SCAQMD, Risk Assessment Proceedures for Rules 1401 and 212,
Attachment L, Tables for Applications Deemed Complete on or after July 1, 2005.

APPENDIX C
Detailed Risk Tables

Appendix C

Maximum Exposed Individual Resident and Contribution

Valero Wilmington Refinery
New Cogeneration Unit

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
PAHs	8.44E-09	1.12E-07	1.68E-08	0.00E+00	0.00E+00	0.00E+00	1.42E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E-07	2.80E-07
Chromium (Hex)	4.76E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.76E-08
Formaldehyde	4.39E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.39E-08
Arsenic	9.24E-10	2.21E-09	1.08E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-09	4.41E-09
Benzene	3.52E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-09
Acetaldehyde	2.66E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-09
Nickel	1.06E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-09
Ethyl Benzene	7.82E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-10
1,3-Butadiene	6.92E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.92E-10
Naphthalene	4.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-10
Cadmium	4.18E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.18E-10
Lead	3.22E-11	2.05E-12	6.77E-11	0.00E+00	0.00E+00	0.00E+00	4.83E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-10	1.50E-10
Beryllium	9.66E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-11
Benzo(a)pyrene	2.24E-12	2.97E-11	4.45E-12	0.00E+00	0.00E+00	0.00E+00	3.77E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-11	7.41E-11
Dibenz(a,h)anthracene	2.35E-12	1.02E-11	1.52E-12	0.00E+00	0.00E+00	0.00E+00	1.29E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-11	2.69E-11
Benzo(a)anthracene	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
Indeno(1,2,3-cd)pyrene	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
Benzo(b)fluoranthene	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
Benzo(k)fluoranthene	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
Chrysene	2.24E-14	2.97E-13	4.45E-14	0.00E+00	0.00E+00	0.00E+00	3.77E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-13	7.41E-13
SUM	1.11E-07	1.14E-07	1.80E-08	0.00E+00	0.00E+00	0.00E+00	1.43E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-07	3.86E-07

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
PAHs	2.19%	29.02%	4.35%	0.00%	0.00%	0.00%	36.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.21%	72.54%
Chromium (Hex)	12.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.33%
Formaldehyde	11.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.37%
Arsenic	0.24%	0.57%	0.28%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.14%
Benzene	0.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%
Acetaldehyde	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%
Nickel	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%
Ethyl Benzene	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%
1,3-Butadiene	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.18%
Naphthalene	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.11%
Cadmium	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.11%
Lead	0.01%	0.00%	0.02%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.04%
Beryllium	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Benzo(a)pyrene	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%
Dibenz(a,h)anthracene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
Benzo(a)anthracene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Indeno(1,2,3-cd)pyrene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzo(b)fluoranthene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzo(k)fluoranthene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chrysene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SUM	28.76%	29.53%	4.66%	0.00%	0.00%	0.00%	37.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	71.24%	100.00%

Oral is the combined risk of all non-inhalation pathways.

Appendix C

Maximum Exposed Individual Worker and Contribution

Valero Wilmington Refinery
New Cogeneration Unit

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
PAHs	2.89E-09	6.62E-08	8.61E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E-08	7.77E-08
Chromium (Hex)	1.46E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E-08
Formaldehyde	1.35E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-08
Arsenic	2.83E-10	1.31E-09	5.51E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-09	2.14E-09
Benzene	1.08E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-09
Acetaldehyde	8.17E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.17E-10
Nickel	3.26E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E-10
Ethyl Benzene	2.40E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-10
1,3-Butadiene	2.12E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.12E-10
Naphthalene	1.33E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-10
Cadmium	1.28E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-10
Lead	1.10E-11	2.05E-11	3.47E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.52E-11	6.62E-11
Beryllium	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-11
Benzo(a)pyrene	7.64E-13	1.75E-11	2.28E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-11	2.06E-11
Dibenz(a,h)anthracene	8.04E-13	5.99E-12	7.79E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-12	7.58E-12
Benzo(a)anthracene	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
Indeno(1,2,3-cd)pyrene	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
Benzo(b)fluoranthene	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
Benzo(k)fluoranthene	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
Chrysene	7.64E-15	1.75E-13	2.28E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-13	2.06E-13
SUM	3.42E-08	6.76E-08	9.20E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.68E-08	1.11E-07

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
PAHs	2.60%	59.64%	7.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	67.39%	70.00%
Chromium (Hex)	13.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	13.15%
Formaldehyde	12.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.16%
Arsenic	0.25%	1.18%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.68%	1.93%
Benzene	0.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.97%
Acetaldehyde	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.74%
Nickel	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.29%
Ethyl Benzene	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.22%
1,3-Butadiene	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.19%
Naphthalene	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.12%
Cadmium	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.12%
Lead	0.01%	0.02%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.06%
Beryllium	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Benzo(a)pyrene	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%
Dibenz(a,h)anthracene	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
Benzo(a)anthracene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Indeno(1,2,3-cd)pyrene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzo(b)fluoranthene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benzo(k)fluoranthene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Chrysene	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SUM	30.81%	60.90%	8.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	69.19%	100.00%

Oral is the combined risk of all non-inhalation pathways.

Appendix C

Maximum Chronic Hazard Index and Contribution

Valero Wilmington Refinery
New Cogeneration Unit

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	RESP
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.24E-03**	0.00E+00	0.00E+00	1.24E-03	**42.8%**
Ammonia	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**8.13E-04**	0.00E+00	0.00E+00	8.13E-04	**28.0%**
Arsenic	5.34E-04	5.34E-04	0.00E+00	5.34E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.34E-04**	5.34E-04	0.00E+00	5.34E-04	**18.4%**
Hydrogen Sulfide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.48E-04**	0.00E+00	0.00E+00	1.48E-04	**5.1%**
Nickel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.15E-07	0.00E+00	0.00E+00	0.00E+00	**1.24E-04**	0.00E+00	1.24E-04	1.24E-04	**4.3%**
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.01E-05**	0.00E+00	0.00E+00	1.01E-05	**0.3%**
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-07	8.75E-06	0.00E+00	0.00E+00	**8.75E-06**	0.00E+00	0.00E+00	8.75E-06	**0.3%**
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E-06	0.00E+00	**7.43E-06**	0.00E+00	0.00E+00	9.08E-06	**0.3%**
Toluene	0.00E+00	6.41E-06	0.00E+00	6.41E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**6.41E-06**	0.00E+00	0.00E+00	6.41E-06	**0.2%**
Chromium (Hex)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.48E-06**	0.00E+00	8.77E-08	2.48E-06	**0.1%**
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.14E-06**	0.00E+00	0.00E+00	2.14E-06	**0.1%**
Propylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.90E-06**	0.00E+00	0.00E+00	1.90E-06	**0.1%**
Xylenes	0.00E+00	1.30E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.30E-06**	0.00E+00	0.00E+00	1.30E-06	**0.0%**
Mercury	0.00E+00	1.87E-04	0.00E+00	1.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-04	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	1.87E-04	**0.0%**
Manganese	0.00E+00	3.53E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	3.53E-05	**0.0%**
Phenol	4.81E-06	4.81E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-06	0.00E+00	4.81E-06	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	4.81E-06	**0.0%**
Benzene	0.00E+00	3.13E-06	0.00E+00	3.13E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	3.13E-06	3.13E-06	**0.0%**
1,3-Butadiene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.07E-07	**0.00E+00**	0.00E+00	0.00E+00	3.07E-07	**0.0%**
Ethyl Benzene	0.00E+00	0.00E+00	0.00E+00	2.39E-07	2.39E-07	0.00E+00	2.39E-07	0.00E+00	2.39E-07	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	2.39E-07	**0.0%**
Hexane	0.00E+00	1.23E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	1.23E-07	**0.0%**
Selenium	7.38E-08	7.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E-08	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	7.38E-08	**0.0%**
Chlorobenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-08	0.00E+00	2.41E-08	2.41E-08	**0.00E+00**	0.00E+00	0.00E+00	2.41E-08	**0.0%**
SUM	5.38E-04	7.72E-04	0.00E+00	7.30E-04	2.39E-07	0.00E+00	5.87E-06	8.75E-06	2.01E-04	3.31E-07	**2.90E-03**	5.34E-04	1.28E-04	2.90E-03	**100.0%**

Appendix C

Maximum Acute Hazard Index and Contribution

Valero Wilmington Refinery
New Cogeneration Unit

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	EYE
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**9.66E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03	**61.5%**
Ammonia	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**5.92E-03**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-03	0.00E+00	0.00E+00	5.92E-03	**37.7%**
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.44E-04**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-04	0.00E+00	0.00E+00	1.44E-04	**0.9%**
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**7.91E-06**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.91E-06	0.00E+00	0.00E+00	7.91E-06	**0.1%**
Toluene	0.00E+00	2.48E-06	0.00E+00	2.48E-06	0.00E+00	**2.48E-06**	0.00E+00	0.00E+00	0.00E+00	2.48E-06	2.48E-06	0.00E+00	0.00E+00	2.48E-06	**0.0%**
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.02E-09**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.02E-09	0.00E+00	0.00E+00	3.02E-09	**0.0%**
Hydrogen Sulfide	0.00E+00	1.79E-03	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-03	**0.0%**
Mercury	0.00E+00	1.67E-04	0.00E+00	1.67E-04	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-04	**0.0%**
Arsenic	9.78E-05	9.78E-05	0.00E+00	9.78E-05	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.78E-05	**0.0%**
Nickel	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	4.95E-05	0.00E+00	0.00E+00	4.95E-05	0.00E+00	0.00E+00	4.95E-05	**0.0%**
Benzene	0.00E+00	0.00E+00	0.00E+00	6.89E-06	0.00E+00	**0.00E+00**	0.00E+00	6.89E-06	0.00E+00	6.89E-06	0.00E+00	0.00E+00	6.89E-06	6.89E-06	**0.0%**
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-06	0.00E+00	0.00E+00	1.43E-06	**0.0%**
SUM	9.78E-05	2.05E-03	0.00E+00	2.74E-04	0.00E+00	**1.57E-02**	0.00E+00	5.64E-05	0.00E+00	9.37E-06	6.13E-03	0.00E+00	6.89E-06	1.57E-02	**100.0%**

```
This file: C:\HARP\PROJECTS\2709Val\Cogen1\2709 MEIR.txt

Created by HARP Version 1.4d  Build 23.09.07
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 9/7/2011 2:51:33 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2709Val\Cogen1\2709CGN1.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD27

Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method:   Derived  (Adjusted) Method
Health effect:     Cancer Risk
Receptor(s):       669
Sources(s):        All
Chemicals(s):      All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)            0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

   HUMAN INGESTION
   Fraction of ingested leafy vegetable
     from home grown source         0.052
   Fraction of ingested exposed vegetable
     from home grown source         0.052
   Fraction of ingested protected vegetable
     from home grown source         0.052
   Fraction of ingested root vegetable
```

from home grown source 0.052

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	50000	Formaldehyde	Formaldehyde	0.000E+00
0002	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0003	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0004	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0005	71432	Benzene	Benzene	0.000E+00
0006	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0007	85018	Phenanthrene	Phenanthrene	0.000E+00
0008	86737	Fluorene	Fluorene	0.000E+00
0009	91203	Naphthalene	Naphthalene	0.000E+00
0010	91576	2MeNaphthalene	2-Methyl naphthalene	0.000E+00
0011	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0012	108883	Toluene	Toluene	0.000E+00
0013	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	115071	Propylene	Propylene	0.000E+00
0016	120127	Anthracene	Anthracene	0.000E+00
0017	129000	Pyrene	Pyrene	0.000E+00
0018	191242	B[g,h,i]perylen	Benzo[g,h,i]perylene	0.000E+00
0019	192972	B[e]pyrene	Benzo[e]pyrene	0.000E+00
0020	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0021	198550	Perylene	Perylene	0.000E+00
0022	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0023	206440	Fluoranthene	Fluoranthene	0.000E+00
0024	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0025	208968	Acenaphthylene	Acenaphthylene	0.000E+00
0026	218019	Chrysene	Chrysene	0.000E+00
0027	7439921	Lead	Lead	0.000E+00
0028	7439965	Manganese	Manganese	0.000E+00
0029	7439976	Mercury	Mercury	0.000E+00
0030	7440020	Nickel	Nickel	0.000E+00
0031	7440224	Silver	Silver	0.000E+00
0032	7440280	Thallium	Thallium	0.000E+00
0033	7440360	Antimony	Antimony	0.000E+00
0034	7440382	Arsenic	Arsenic	0.000E+00

0035	7440393	Barium	Barium	0.000E+00
0036	7440417	Beryllium	Beryllium	0.000E+00
0037	7440439	Cadmium	Cadmium	0.000E+00
0038	7440473	Chromium	Chromium	0.000E+00
0039	7440508	Copper	Copper	0.000E+00
0040	7440666	Zinc	Zinc	0.000E+00
0041	7723140	Phosphorus	Phosphorus	0.000E+00
0042	7782492	Selenium	Selenium	0.000E+00
0043	7783064	H2S	Hydrogen sulfide	0.000E+00
0044	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0045	7664417	NH3	Ammonia	0.000E+00
0046	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0047	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0048	1151	PAHs-w/o	PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]	0.000E+00
0049	110543	Hexane	Hexane	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0002	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0003	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0004	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0005	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0006	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0007	85018	Phenanthrene	*	*	*	*	*
0008	86737	Fluorene	*	*	*	*	*
0009	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0010	91576	2MeNaphthalene	*	*	*	*	*
0011	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0012	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0013	108907	Chlorobenzn	*	*	1.00E+03	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	115071	Propylene	*	*	3.00E+03	*	*
0016	120127	Anthracene	*	*	*	*	*
0017	129000	Pyrene	*	*	*	*	*
0018	191242	B[g,h,i]perylen	*	*	*	*	*
0019	192972	B[e]pyrene	*	*	*	*	*
0020	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0021	198550	Perylene	*	*	*	*	*
0022	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0023	206440	Fluoranthene	*	*	*	*	*
0024	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0025	208968	Acenaphthylene	*	*	*	*	*
0026	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0027	7439921	Lead	4.20E-02	8.50E-03	*	*	*
0028	7439965	Manganese	*	*	9.00E-02	*	*
0029	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0030	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0031	7440224	Silver	*	*	*	*	*
0032	7440280	Thallium	*	*	*	*	*
0033	7440360	Antimony	*	*	*	*	*
0034	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0035	7440393	Barium	*	*	*	*	*
0036	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*

0037	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0038	7440473	Chromium	*	*	*	*	*
0039	7440508	Copper	*	*	*	*	1.00E+02
0040	7440666	Zinc	*	*	*	*	*
0041	7723140	Phosphorus	*	*	*	*	*
0042	7782492	Selenium	*	*	2.00E+01	*	*
0043	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0044	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0045	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0046	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0047	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0048	1151	PAHs-w/o	3.90E+00	1.20E+01	*	*	*
0049	110543	Hexane	*	*	7.00E+03	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=1 STK=104 NAME=VALERO REFINERY STACK 104 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	2342.496207	0.267408243
50328	B[a]P	1	0	0.000716018	0.000000081737
53703	D[a,h]anthracen	1	0	0.000716018	0.000000081737
56553	B[a]anthracene	1	0	0.000716018	0.000000081737
71432	Benzene	1	0	39.49877813	0.004508993
75070	Acetaldehyde	1	0	298.3168356	0.034054433
85018	Phenanthrene	1	0	0.021480537	0.00000245212
86737	Fluorene	1	0	0.007160179	0.000000817372
91203	Naphthalene	1	0	4.050269385	0.00046236
91576	2MeNaphthalene	1	0	0.010597065	0.00000120971
100414	Ethyl Benzene	1	0	100.7667503	0.011503054
108883	Toluene	1	0	404.8991527	0.046221364
108907	Chlorobenzn	1	0	5.077567983	0.000579631
108952	Phenol	1	0	202.2788796	0.023091196
115071	Propylene	1	0	89.72570225	0.01024266
120127	Anthracene	1	0	0.000875187	0.000000099907
129000	Pyrene	1	0	0.004868922	0.000000555813
191242	B[g,h,i]perylen	1	0	0.009308233	0.00000106258
192972	B[e]pyrene	1	0	0.000498633	0.000000056921
193395	In[1,2,3-cd]pyr	1	0	0.000716018	0.000000081737
198550	Perylene	1	0	0.000716018	0.000000081737
205992	B[b]fluoranthen	1	0	0.000716018	0.000000081737
206440	Fluoranthene	1	0	0.004868922	0.000000555813
207089	B[k]fluoranthen	1	0	0.000716018	0.000000081737
208968	Acenaphthylene	1	0	0.000716018	0.000000081737
218019	Chrysene	1	0	0.000716018	0.000000081737
7439921	Lead	1	0	0.957674351	0.000109324
7439965	Manganese	1	0	0.668651519	0.0000763301
7439976	Mercury	1	0	0.440801534	0.0000503198
7440020	Nickel	1	0	1.309773847	0.000149518
7440224	Silver	1	0	2.278154777	0.000260063
7440280	Thallium	1	0	8.168632322	0.000932492
7440360	Antimony	1	0	0.731275097	0.0000834789
7440382	Arsenic	1	0	0.086305449	0.00000985222
7440393	Barium	1	0	8.168632322	0.000932492
7440417	Beryllium	1	0	0.012885452	0.00000147094

7440439	Cadmium	1	0	0.031268092	0.00000356942
7440473	Chromium	1	0	0.308831789	0.0000352548
7440508	Copper	1	0	0.631161925	0.0000720504
7440666	Zinc	1	0	20.87817497	0.002383353
7723140	Phosphorus	1	0	0.907485964	0.000103594
7782492	Selenium	1	0	0.310525129	0.0000354481
7783064	H2S	1	0	307.3597102	0.035086725
18540299	Cr(VI)	1	0	0.104511242	0.0000119305
7664417	NH3	1	0	24297.69368	2.773709324
106990	1,3-Butadiene	1	0	1.292461557	0.0000976026
1330207	Xylenes	1	0	192.2499764	0.0000333978
1151	PAHs-w/o	1	0	2.702687264	0.033057385
110543	Hexane	1	0	*	*

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=2 STK=105 NAME=VALERO REFINERY STACK 105 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	*	*
50328	B[a]P	1	0	*	*
53703	D[a,h]anthracen	1	0	*	*
56553	B[a]anthracene	1	0	*	*
71432	Benzene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
85018	Phenanthrene	1	0	*	*
86737	Fluorene	1	0	*	*
91203	Naphthalene	1	0	*	*
91576	2MeNaphthalene	1	0	*	*
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	*	*
108907	Chlorobenzn	1	0	*	*
108952	Phenol	1	0	*	*
115071	Propylene	1	0	125.34	0.014308
120127	Anthracene	1	0	*	*
129000	Pyrene	1	0	*	*
191242	B[g,h,i]perylen	1	0	*	*
192972	B[e]pyrene	1	0	*	*
193395	In[1,2,3-cd]pyr	1	0	*	*
198550	Perylene	1	0	*	*
205992	B[b]fluoranthen	1	0	*	*
206440	Fluoranthene	1	0	*	*
207089	B[k]fluoranthen	1	0	*	*
208968	Acenaphthylene	1	0	*	*
218019	Chrysene	1	0	*	*
7439921	Lead	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7440224	Silver	1	0	*	*
7440280	Thallium	1	0	*	*
7440360	Antimony	1	0	*	*
7440382	Arsenic	1	0	*	*
7440393	Barium	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440473	Chromium	1	0	*	*
7440508	Copper	1	0	*	*

7440666	Zinc	1	0	*	*
7723140	Phosphorus	1	0	*	*
7782492	Selenium	1	0	*	*
7783064	H2S	1	0	0.45	0.0000513
18540299	Cr(VI)	1	0	*	*
7664417	NH3	1	0	1124	0.128311
106990	1,3-Butadiene	1	0	*	*
1330207	Xylenes	1	0	*	*
1151	PAHs-w/o	1	0	*	*
110543	Hexane	1	0	20.44	0.002334

CANCER RISK REPORT

DOMINANT PATHWAYS, Receptor 669

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	A	-	-	-	-	-	-	-	-	-	-	-
0002	-	YES	-	-	-	-	YES	-	-	-	-	-
0003	-	YES	-	-	-	-	YES	-	-	-	-	-
0004	-	YES	-	-	-	-	YES	-	-	-	-	-
0005	A	-	-	-	-	-	-	-	-	-	-	-
0006	A	-	-	-	-	-	-	-	-	-	-	-
0007	-	-	-	-	-	-	-	-	-	-	-	-
0008	-	-	-	-	-	-	-	-	-	-	-	-
0009	A	-	-	-	-	-	-	-	-	-	-	-
0010	-	-	-	-	-	-	-	-	-	-	-	-
0011	A	-	-	-	-	-	-	-	-	-	-	-
0012	-	-	-	-	-	-	-	-	-	-	-	-
0013	-	-	-	-	-	-	-	-	-	-	-	-
0014	-	-	-	-	-	-	-	-	-	-	-	-
0015	-	-	-	-	-	-	-	-	-	-	-	-
0016	-	-	-	-	-	-	-	-	-	-	-	-
0017	-	-	-	-	-	-	-	-	-	-	-	-
0018	-	-	-	-	-	-	-	-	-	-	-	-
0019	-	-	-	-	-	-	-	-	-	-	-	-
0020	-	YES	-	-	-	-	YES	-	-	-	-	-
0021	-	-	-	-	-	-	-	-	-	-	-	-
0022	-	YES	-	-	-	-	YES	-	-	-	-	-
0023	-	-	-	-	-	-	-	-	-	-	-	-
0024	-	YES	-	-	-	-	YES	-	-	-	-	-
0025	-	-	-	-	-	-	-	-	-	-	-	-
0026	-	YES	-	-	-	-	YES	-	-	-	-	-
0027	-	-	YES	-	-	-	YES	-	-	-	-	-
0028	-	-	-	-	-	-	-	-	-	-	-	-
0029	-	-	-	-	-	-	-	-	-	-	-	-
0030	A	-	-	-	-	-	-	-	-	-	-	-
0031	-	-	-	-	-	-	-	-	-	-	-	-
0032	-	-	-	-	-	-	-	-	-	-	-	-
0033	-	-	-	-	-	-	-	-	-	-	-	-
0034	A	YES	-	-	-	-	-	-	-	-	-	-
0035	-	-	-	-	-	-	-	-	-	-	-	-
0036	A	-	-	-	-	-	-	-	-	-	-	-
0037	A	-	-	-	-	-	-	-	-	-	-	-
0038	-	-	-	-	-	-	-	-	-	-	-	-
0039	-	-	-	-	-	-	-	-	-	-	-	-
0040	-	-	-	-	-	-	-	-	-	-	-	-
0041	-	-	-	-	-	-	-	-	-	-	-	-

0042	-	-	-	-	-	-	-	-	-	-	-	-
0043	-	-	-	-	-	-	-	-	-	-	-	-
0044	A	-	-	-	-	-	-	-	-	-	-	-
0045	-	-	-	-	-	-	-	-	-	-	-	-
0046	A	-	-	-	-	-	-	-	-	-	-	-
0047	-	-	-	-	-	-	-	-	-	-	-	-
0048	-	YES	-	-	-	-	YES	-	-	-	-	-
0049	-	-	-	-	-	-	-	-	-	-	-	-

DERIVED CANCER RISK, RECEPTOR 669

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
UTME	UTMN														
0001	4.39E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.39E-08
0002	2.24E-12	2.97E-11	4.45E-12	0.00E+00	0.00E+00	0.00E+00	3.77E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-11	7.41E-11
0003	2.35E-12	1.02E-11	1.52E-12	0.00E+00	0.00E+00	0.00E+00	1.29E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.46E-11	2.69E-11
0004	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
0005	3.52E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-09
0006	2.66E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-09
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0009	4.34E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-10
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	7.82E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-10
0012	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0015	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
0021	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0022	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	2.24E-13	2.97E-12	4.45E-13	0.00E+00	0.00E+00	0.00E+00	3.77E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-12	7.41E-12
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	2.24E-14	2.97E-13	4.45E-14	0.00E+00	0.00E+00	0.00E+00	3.77E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.19E-13	7.41E-13
0027	3.22E-11	2.05E-12	6.77E-11	0.00E+00	0.00E+00	0.00E+00	4.83E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-10	1.50E-10
0028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0029	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0030	1.06E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-09
0031	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0032	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0033	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0034	9.24E-10	2.21E-09	1.08E-09	0.00E+00	0.00E+00	0.00E+00	1.98E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-09	4.41E-09
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	9.66E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-11
0037	4.18E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.18E-10
0038	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0041	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	4.76E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.76E-08

```
0045  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0046  6.92E-10 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 6.92E-10
0047  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0048  8.44E-09 1.12E-07 1.68E-08 0.00E+00 0.00E+00 0.00E+00 1.42E-07 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 2.71E-07 2.80E-07
0049  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
SUM   1.11E-07 1.14E-07 1.80E-08 0.00E+00 0.00E+00 0.00E+00 1.43E-07 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 2.75E-07 3.86E-07
388700 3738100
```

```
This file: C:\HARP\PROJECTS\2709Val\Cogen1\2709 MEIW.txt

Created by HARP Version 1.4d  Build 23.09.07
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 9/7/2011 2:56:26 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2709Val\Cogen1\2709CGN1.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\worker pathway.sit

Coordinate system: UTM NAD27

Screening mode is OFF

Exposure duration: Standard work schedule (49 wks/yr, 5 days/wk, 8 hrs/day, 40 yrs)
Analysis method:   Point estimate
Health effect:     Cancer Risk
Receptor(s):       648
Sources(s):        All
Chemicals(s):      All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)            0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION
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*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway disabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	50000	Formaldehyde	Formaldehyde	0.000E+00
0002	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0003	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0004	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0005	71432	Benzene	Benzene	0.000E+00
0006	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0007	85018	Phenanthrene	Phenanthrene	0.000E+00
0008	86737	Fluorene	Fluorene	0.000E+00
0009	91203	Naphthalene	Naphthalene	0.000E+00
0010	91576	2MeNaphthalene	2-Methyl naphthalene	0.000E+00
0011	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0012	108883	Toluene	Toluene	0.000E+00
0013	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	115071	Propylene	Propylene	0.000E+00
0016	120127	Anthracene	Anthracene	0.000E+00
0017	129000	Pyrene	Pyrene	0.000E+00
0018	191242	B[g,h,i]perylen	Benzo[g,h,i]perylene	0.000E+00
0019	192972	B[e]pyrene	Benzo[e]pyrene	0.000E+00
0020	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0021	198550	Perylene	Perylene	0.000E+00
0022	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0023	206440	Fluoranthene	Fluoranthene	0.000E+00
0024	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0025	208968	Acenaphthylene	Acenaphthylene	0.000E+00
0026	218019	Chrysene	Chrysene	0.000E+00
0027	7439921	Lead	Lead	0.000E+00
0028	7439965	Manganese	Manganese	0.000E+00
0029	7439976	Mercury	Mercury	0.000E+00
0030	7440020	Nickel	Nickel	0.000E+00
0031	7440224	Silver	Silver	0.000E+00
0032	7440280	Thallium	Thallium	0.000E+00
0033	7440360	Antimony	Antimony	0.000E+00
0034	7440382	Arsenic	Arsenic	0.000E+00
0035	7440393	Barium	Barium	0.000E+00
0036	7440417	Beryllium	Beryllium	0.000E+00
0037	7440439	Cadmium	Cadmium	0.000E+00
0038	7440473	Chromium	Chromium	0.000E+00
0039	7440508	Copper	Copper	0.000E+00
0040	7440666	Zinc	Zinc	0.000E+00
0041	7723140	Phosphorus	Phosphorus	0.000E+00
0042	7782492	Selenium	Selenium	0.000E+00

0043	7783064	H2S	Hydrogen sulfide	0.000E+00
0044	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0045	7664417	NH3	Ammonia	0.000E+00
0046	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0047	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0048	1151	PAHs-w/o	PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]	0.000E+00
0049	110543	Hexane	Hexane	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0002	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0003	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0004	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0005	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0006	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0007	85018	Phenanthrene	*	*	*	*	*
0008	86737	Fluorene	*	*	*	*	*
0009	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0010	91576	2MeNaphthalene	*	*	*	*	*
0011	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0012	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0013	108907	Chlorobenzn	*	*	1.00E+03	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	115071	Propylene	*	*	3.00E+03	*	*
0016	120127	Anthracene	*	*	*	*	*
0017	129000	Pyrene	*	*	*	*	*
0018	191242	B[g,h,i]perylen	*	*	*	*	*
0019	192972	B[e]pyrene	*	*	*	*	*
0020	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0021	198550	Perylene	*	*	*	*	*
0022	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0023	206440	Fluoranthene	*	*	*	*	*
0024	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0025	208968	Acenaphthylene	*	*	*	*	*
0026	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0027	7439921	Lead	4.20E-02	8.50E-03	*	*	*
0028	7439965	Manganese	*	*	9.00E-02	*	*
0029	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0030	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0031	7440224	Silver	*	*	*	*	*
0032	7440280	Thallium	*	*	*	*	*
0033	7440360	Antimony	*	*	*	*	*
0034	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0035	7440393	Barium	*	*	*	*	*
0036	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0037	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0038	7440473	Chromium	*	*	*	*	*
0039	7440508	Copper	*	*	*	*	1.00E+02
0040	7440666	Zinc	*	*	*	*	*
0041	7723140	Phosphorus	*	*	*	*	*
0042	7782492	Selenium	*	*	2.00E+01	*	*
0043	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0044	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*

0045	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0046	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0047	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0048	1151	PAHs-w/o	3.90E+00	1.20E+01	*	*	*
0049	110543	Hexane	*	*	7.00E+03	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=1 STK=104 NAME=VALERO REFINERY STACK 104 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	2342.496207	0.267408243
50328	B[a]P	1	0	0.000716018	0.000000081737
53703	D[a,h]anthracen	1	0	0.000716018	0.000000081737
56553	B[a]anthracene	1	0	0.000716018	0.000000081737
71432	Benzene	1	0	39.49877813	0.004508993
75070	Acetaldehyde	1	0	298.3168356	0.034054433
85018	Phenanthrene	1	0	0.021480537	0.00000245212
86737	Fluorene	1	0	0.007160179	0.000000817372
91203	Naphthalene	1	0	4.050269385	0.00046236
91576	2MeNaphthalene	1	0	0.010597065	0.00000120971
100414	Ethyl Benzene	1	0	100.7667503	0.011503054
108883	Toluene	1	0	404.8991527	0.046221364
108907	Chlorobenzn	1	0	5.077567983	0.000579631
108952	Phenol	1	0	202.2788796	0.023091196
115071	Propylene	1	0	89.72570225	0.01024266
120127	Anthracene	1	0	0.000875187	0.000000099907
129000	Pyrene	1	0	0.004868922	0.000000555813
191242	B[g,h,i]perylen	1	0	0.009308233	0.00000106258
192972	B[e]pyrene	1	0	0.000498633	0.000000056921
193395	In[1,2,3-cd]pyr	1	0	0.000716018	0.000000081737
198550	Perylene	1	0	0.000716018	0.000000081737
205992	B[b]fluoranthen	1	0	0.000716018	0.000000081737
206440	Fluoranthene	1	0	0.004868922	0.000000555813
207089	B[k]fluoranthen	1	0	0.000716018	0.000000081737
208968	Acenaphthylene	1	0	0.000716018	0.000000081737
218019	Chrysene	1	0	0.000716018	0.000000081737
7439921	Lead	1	0	0.957674351	0.000109324
7439965	Manganese	1	0	0.668651519	0.0000763301
7439976	Mercury	1	0	0.440801534	0.0000503198
7440020	Nickel	1	0	1.309773847	0.000149518
7440224	Silver	1	0	2.278154777	0.000260063
7440280	Thallium	1	0	8.168632322	0.000932492
7440360	Antimony	1	0	0.731275097	0.0000834789
7440382	Arsenic	1	0	0.086305449	0.00000985222
7440393	Barium	1	0	8.168632322	0.000932492
7440417	Beryllium	1	0	0.012885452	0.00000147094
7440439	Cadmium	1	0	0.031268092	0.00000356942
7440473	Chromium	1	0	0.308831789	0.0000352548
7440508	Copper	1	0	0.631161925	0.0000720504
7440666	Zinc	1	0	20.87817497	0.002383353
7723140	Phosphorus	1	0	0.907485964	0.000103594
7782492	Selenium	1	0	0.310525129	0.0000354481
7783064	H2S	1	0	307.3597102	0.035086725
18540299	Cr(VI)	1	0	0.104511242	0.0000119305

7664417	NH3	1	0	24297.69368	2.773709324
106990	1,3-Butadiene	1	0	1.292461557	0.0000976026
1330207	Xylenes	1	0	192.2499764	0.0000333978
1151	PAHs-w/o	1	0	2.702687264	0.033057385
110543	Hexane	1	0	*	*

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=2 STK=105 NAME=VALERO REFINERY STACK 105 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	*	*
50328	B[a]P	1	0	*	*
53703	D[a,h]anthracen	1	0	*	*
56553	B[a]anthracene	1	0	*	*
71432	Benzene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
85018	Phenanthrene	1	0	*	*
86737	Fluorene	1	0	*	*
91203	Naphthalene	1	0	*	*
91576	2MeNaphthalene	1	0	*	*
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	*	*
108907	Chlorobenzn	1	0	*	*
108952	Phenol	1	0	*	*
115071	Propylene	1	0	125.34	0.014308
120127	Anthracene	1	0	*	*
129000	Pyrene	1	0	*	*
191242	B[g,h,i]perylen	1	0	*	*
192972	B[e]pyrene	1	0	*	*
193395	In[1,2,3-cd]pyr	1	0	*	*
198550	Perylene	1	0	*	*
205992	B[b]fluoranthen	1	0	*	*
206440	Fluoranthene	1	0	*	*
207089	B[k]fluoranthen	1	0	*	*
208968	Acenaphthylene	1	0	*	*
218019	Chrysene	1	0	*	*
7439921	Lead	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7440224	Silver	1	0	*	*
7440280	Thallium	1	0	*	*
7440360	Antimony	1	0	*	*
7440382	Arsenic	1	0	*	*
7440393	Barium	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440473	Chromium	1	0	*	*
7440508	Copper	1	0	*	*
7440666	Zinc	1	0	*	*
7723140	Phosphorus	1	0	*	*
7782492	Selenium	1	0	*	*
7783064	H2S	1	0	0.45	0.0000513
18540299	Cr(VI)	1	0	*	*
7664417	NH3	1	0	1124	0.128311
106990	1,3-Butadiene	1	0	*	*
1330207	Xylenes	1	0	*	*

1151	PAHs-w/o	1	0	*	*
110543	Hexane	1	0	20.44	0.002334

CANCER RISK REPORT

AVERAGE CANCER RISK, RECEPTOR 648

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
UTME	UTMN														
0001	1.35E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.35E-08
0002	7.64E-13	1.75E-11	2.28E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-11	2.06E-11
0003	8.04E-13	5.99E-12	7.79E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-12	7.58E-12
0004	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
0005	1.08E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-09
0006	8.17E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.17E-10
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0008	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0009	1.33E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-10
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0011	2.40E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-10
0012	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0014	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0015	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0020	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
0021	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0022	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0024	7.64E-14	1.75E-12	2.28E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-12	2.06E-12
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0026	7.64E-15	1.75E-13	2.28E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-13	2.06E-13
0027	1.10E-11	2.05E-11	3.47E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.52E-11	6.62E-11
0028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0029	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0030	3.26E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.26E-10
0031	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0032	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0033	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0034	2.83E-10	1.31E-09	5.51E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-09	2.14E-09
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0036	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-11
0037	1.28E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.28E-10
0038	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0039	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0040	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0041	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0042	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0043	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0044	1.46E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.46E-08
0045	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0046	2.12E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.12E-10
0047	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
0048	2.89E-09	6.62E-08	8.61E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E-08	7.77E-08

```
0049  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
SUM   3.42E-08 6.76E-08 9.20E-09 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.68E-08 1.11E-07
386600 3738100
```

```
This file: C:\HARP\PROJECTS\2709Val\Cogen1\2709 MCHI.txt

Created by HARP Version 1.4d  Build 23.09.07
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 9/9/2011 5:04:11 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2709Val\Cogen1\2709CGN1.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: database
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD27

Screening mode is OFF

Exposure duration: resident
Analysis method:   Average Point Estimate
Health effect:     Chronic HI
Receptor(s):       647
Sources(s):        All
Chemicals(s):      All

SITE PARAMETERS

DEPOSITION

   Deposition rate (m/s)            0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

   HUMAN INGESTION
   Fraction of ingested leafy vegetable
     from home grown source         0.052
   Fraction of ingested exposed vegetable
     from home grown source         0.052
   Fraction of ingested protected vegetable
     from home grown source         0.052
   Fraction of ingested root vegetable
```

from home grown source 0.052

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	50000	Formaldehyde	Formaldehyde	0.000E+00
0002	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0003	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0004	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0005	71432	Benzene	Benzene	0.000E+00
0006	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0007	85018	Phenanthrene	Phenanthrene	0.000E+00
0008	86737	Fluorene	Fluorene	0.000E+00
0009	91203	Naphthalene	Naphthalene	0.000E+00
0010	91576	2MeNaphthalene	2-Methyl naphthalene	0.000E+00
0011	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0012	108883	Toluene	Toluene	0.000E+00
0013	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	115071	Propylene	Propylene	0.000E+00
0016	120127	Anthracene	Anthracene	0.000E+00
0017	129000	Pyrene	Pyrene	0.000E+00
0018	191242	B[g,h,i]perylen	Benzo[g,h,i]perylene	0.000E+00
0019	192972	B[e]pyrene	Benzo[e]pyrene	0.000E+00
0020	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0021	198550	Perylene	Perylene	0.000E+00
0022	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0023	206440	Fluoranthene	Fluoranthene	0.000E+00
0024	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0025	208968	Acenaphthylene	Acenaphthylene	0.000E+00
0026	218019	Chrysene	Chrysene	0.000E+00
0027	7439921	Lead	Lead	0.000E+00
0028	7439965	Manganese	Manganese	0.000E+00
0029	7439976	Mercury	Mercury	0.000E+00
0030	7440020	Nickel	Nickel	0.000E+00
0031	7440224	Silver	Silver	0.000E+00
0032	7440280	Thallium	Thallium	0.000E+00
0033	7440360	Antimony	Antimony	0.000E+00
0034	7440382	Arsenic	Arsenic	0.000E+00

0035	7440393	Barium	Barium	0.000E+00
0036	7440417	Beryllium	Beryllium	0.000E+00
0037	7440439	Cadmium	Cadmium	0.000E+00
0038	7440473	Chromium	Chromium	0.000E+00
0039	7440508	Copper	Copper	0.000E+00
0040	7440666	Zinc	Zinc	0.000E+00
0041	7723140	Phosphorus	Phosphorus	0.000E+00
0042	7782492	Selenium	Selenium	0.000E+00
0043	7783064	H2S	Hydrogen sulfide	0.000E+00
0044	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0045	7664417	NH3	Ammonia	0.000E+00
0046	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0047	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0048	1151	PAHs-w/o	PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]	0.000E+00
0049	110543	Hexane	Hexane	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0002	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0003	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0004	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0005	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0006	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0007	85018	Phenanthrene	*	*	*	*	*
0008	86737	Fluorene	*	*	*	*	*
0009	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0010	91576	2MeNaphthalene	*	*	*	*	*
0011	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0012	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0013	108907	Chlorobenzn	*	*	1.00E+03	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	115071	Propylene	*	*	3.00E+03	*	*
0016	120127	Anthracene	*	*	*	*	*
0017	129000	Pyrene	*	*	*	*	*
0018	191242	B[g,h,i]perylen	*	*	*	*	*
0019	192972	B[e]pyrene	*	*	*	*	*
0020	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0021	198550	Perylene	*	*	*	*	*
0022	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0023	206440	Fluoranthene	*	*	*	*	*
0024	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0025	208968	Acenaphthylene	*	*	*	*	*
0026	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0027	7439921	Lead	4.20E-02	8.50E-03	*	*	*
0028	7439965	Manganese	*	*	9.00E-02	*	*
0029	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0030	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0031	7440224	Silver	*	*	*	*	*
0032	7440280	Thallium	*	*	*	*	*
0033	7440360	Antimony	*	*	*	*	*
0034	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0035	7440393	Barium	*	*	*	*	*
0036	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*

0037	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0038	7440473	Chromium	*	*	*	*	*
0039	7440508	Copper	*	*	*	*	1.00E+02
0040	7440666	Zinc	*	*	*	*	*
0041	7723140	Phosphorus	*	*	*	*	*
0042	7782492	Selenium	*	*	2.00E+01	*	*
0043	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0044	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0045	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0046	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0047	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0048	1151	PAHs-w/o	3.90E+00	1.20E+01	*	*	*
0049	110543	Hexane	*	*	7.00E+03	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=1 STK=104 NAME=VALERO REFINERY STACK 104 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	2342.496207	0.267408243
50328	B[a]P	1	0	0.000716018	0.000000081737
53703	D[a,h]anthracen	1	0	0.000716018	0.000000081737
56553	B[a]anthracene	1	0	0.000716018	0.000000081737
71432	Benzene	1	0	39.49877813	0.004508993
75070	Acetaldehyde	1	0	298.3168356	0.034054433
85018	Phenanthrene	1	0	0.021480537	0.00000245212
86737	Fluorene	1	0	0.007160179	0.000000817372
91203	Naphthalene	1	0	4.050269385	0.00046236
91576	2MeNaphthalene	1	0	0.010597065	0.00000120971
100414	Ethyl Benzene	1	0	100.7667503	0.011503054
108883	Toluene	1	0	404.8991527	0.046221364
108907	Chlorobenzn	1	0	5.077567983	0.000579631
108952	Phenol	1	0	202.2788796	0.023091196
115071	Propylene	1	0	89.72570225	0.01024266
120127	Anthracene	1	0	0.000875187	0.000000099907
129000	Pyrene	1	0	0.004868922	0.000000555813
191242	B[g,h,i]perylen	1	0	0.009308233	0.00000106258
192972	B[e]pyrene	1	0	0.000498633	0.000000056921
193395	In[1,2,3-cd]pyr	1	0	0.000716018	0.000000081737
198550	Perylene	1	0	0.000716018	0.000000081737
205992	B[b]fluoranthen	1	0	0.000716018	0.000000081737
206440	Fluoranthene	1	0	0.004868922	0.000000555813
207089	B[k]fluoranthen	1	0	0.000716018	0.000000081737
208968	Acenaphthylene	1	0	0.000716018	0.000000081737
218019	Chrysene	1	0	0.000716018	0.000000081737
7439921	Lead	1	0	0.957674351	0.000109324
7439965	Manganese	1	0	0.668651519	0.0000763301
7439976	Mercury	1	0	0.440801534	0.0000503198
7440020	Nickel	1	0	1.309773847	0.000149518
7440224	Silver	1	0	2.278154777	0.000260063
7440280	Thallium	1	0	8.168632322	0.000932492
7440360	Antimony	1	0	0.731275097	0.0000834789
7440382	Arsenic	1	0	0.086305449	0.00000985222
7440393	Barium	1	0	8.168632322	0.000932492
7440417	Beryllium	1	0	0.012885452	0.00000147094

7440439	Cadmium	1	0	0.031268092	0.00000356942
7440473	Chromium	1	0	0.308831789	0.0000352548
7440508	Copper	1	0	0.631161925	0.0000720504
7440666	Zinc	1	0	20.87817497	0.002383353
7723140	Phosphorus	1	0	0.907485964	0.000103594
7782492	Selenium	1	0	0.310525129	0.0000354481
7783064	H2S	1	0	307.3597102	0.035086725
18540299	Cr(VI)	1	0	0.104511242	0.0000119305
7664417	NH3	1	0	24297.69368	2.773709324
106990	1,3-Butadiene	1	0	1.292461557	0.0000976026
1330207	Xylenes	1	0	192.2499764	0.0000333978
1151	PAHs-w/o	1	0	2.702687264	0.033057385
110543	Hexane	1	0	*	*

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=2 STK=105 NAME=VALERO REFINERY STACK 105 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	*	*
50328	B[a]P	1	0	*	*
53703	D[a,h]anthracen	1	0	*	*
56553	B[a]anthracene	1	0	*	*
71432	Benzene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
85018	Phenanthrene	1	0	*	*
86737	Fluorene	1	0	*	*
91203	Naphthalene	1	0	*	*
91576	2MeNaphthalene	1	0	*	*
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	*	*
108907	Chlorobenzn	1	0	*	*
108952	Phenol	1	0	*	*
115071	Propylene	1	0	125.34	0.014308
120127	Anthracene	1	0	*	*
129000	Pyrene	1	0	*	*
191242	B[g,h,i]perylen	1	0	*	*
192972	B[e]pyrene	1	0	*	*
193395	In[1,2,3-cd]pyr	1	0	*	*
198550	Perylene	1	0	*	*
205992	B[b]fluoranthen	1	0	*	*
206440	Fluoranthene	1	0	*	*
207089	B[k]fluoranthen	1	0	*	*
208968	Acenaphthylene	1	0	*	*
218019	Chrysene	1	0	*	*
7439921	Lead	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7440224	Silver	1	0	*	*
7440280	Thallium	1	0	*	*
7440360	Antimony	1	0	*	*
7440382	Arsenic	1	0	*	*
7440393	Barium	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440473	Chromium	1	0	*	*
7440508	Copper	1	0	*	*

7440666	Zinc	1	0	*	*
7723140	Phosphorus	1	0	*	*
7782492	Selenium	1	0	*	*
7783064	H2S	1	0	0.45	0.0000513
18540299	Cr(VI)	1	0	*	*
7664417	NH3	1	0	1124	0.128311
106990	1,3-Butadiene	1	0	*	*
1330207	Xylenes	1	0	*	*
1151	PAHs-w/o	1	0	*	*
110543	Hexane	1	0	20.44	0.002334

CHRONIC HI REPORT

AVERAGE CHRONIC HI, RECEPTOR 647

CHEM UTMN	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	UTME
0001	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-03	0.00E+00	0.00E+00	1.24E-03	
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0004	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0005	0.00E+00	3.13E-06	0.00E+00	3.13E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.13E-06	3.13E-06	
0006	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-05	0.00E+00	0.00E+00	1.01E-05	
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0008	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.14E-06	0.00E+00	0.00E+00	2.14E-06	
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0011	0.00E+00	0.00E+00	0.00E+00	2.39E-07	2.39E-07	0.00E+00	2.39E-07	0.00E+00	2.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.39E-07	
0012	0.00E+00	6.41E-06	0.00E+00	6.41E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.41E-06	0.00E+00	0.00E+00	6.41E-06	
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-08	0.00E+00	2.41E-08	2.41E-08	0.00E+00	0.00E+00	0.00E+00	2.41E-08	
0014	4.81E-06	4.81E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-06	0.00E+00	4.81E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-06	
0015	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E-06	0.00E+00	0.00E+00	1.90E-06	
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0021	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0022	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0024	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0027	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0028	0.00E+00	3.53E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-05	
0029	0.00E+00	1.87E-04	0.00E+00	1.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-04	
0030	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.15E-07	0.00E+00	0.00E+00	0.00E+00	1.24E-04	0.00E+00	1.24E-04	1.24E-04	
0031	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0032	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0033	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0034	5.34E-04	5.34E-04	0.00E+00	5.34E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.34E-04	5.34E-04	0.00E+00	5.34E-04	
0035	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0036	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-07	8.75E-06	0.00E+00	0.00E+00	8.75E-06	0.00E+00	0.00E+00	8.75E-06	
0037	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E-06	0.00E+00	7.43E-06	0.00E+00	0.00E+00	9.08E-06	
0038	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0039	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
0040	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

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0041  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0042  7.38E-08 7.38E-08 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.38E-08 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 7.38E-08
0043  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.48E-04 0.00E+00 0.00E+00 1.48E-04
0044  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 2.48E-06 0.00E+00 8.77E-08 2.48E-06
0045  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 8.13E-04 0.00E+00 0.00E+00 8.13E-04
0046  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 3.07E-07 0.00E+00 0.00E+00 0.00E+00 3.07E-07
0047  0.00E+00 1.30E-06 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.30E-06 0.00E+00 0.00E+00 1.30E-06
0048  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0049  0.00E+00 1.23E-07 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.23E-07
SUM   5.38E-04 7.72E-04 0.00E+00 7.30E-04 2.39E-07 0.00E+00 5.87E-06 8.75E-06 2.01E-04 3.31E-07 2.90E-03 5.34E-04 1.28E-04 2.90E-03 386500
3738100
```

This file: C:\HARP\PROJECTS\2709Val\Cogen1\2709 MAHI.txt

Created by HARP Version 1.4d Build 23.09.07
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 9/9/2011 5:18:02 PM

EXCEPTION REPORT
(there have been no changes or exceptions)

INPUT FILES:
Source-Receptor file: C:\HARP\PROJECTS\2709Val\Cogen1\2709CGN1.SRC
Averaging period adjustment factors file: not applicable
Emission rates file: database
Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD27

Screening mode is OFF

Analysis method: Point Estimate
Health effect: Acute HI Simple (Concurrent Max.)
Receptor(s): 634
Sources(s): All
Chemicals(s): All

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	50000	Formaldehyde	Formaldehyde	0.000E+00
0002	50328	B[a]P	Benzo[a]pyrene	0.000E+00
0003	53703	D[a,h]anthracen	Dibenz[a,h]anthracene	0.000E+00
0004	56553	B[a]anthracene	Benz[a]anthracene	0.000E+00
0005	71432	Benzene	Benzene	0.000E+00
0006	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0007	85018	Phenanthrene	Phenanthrene	0.000E+00
0008	86737	Fluorene	Fluorene	0.000E+00
0009	91203	Naphthalene	Naphthalene	0.000E+00
0010	91576	2MeNaphthalene	2-Methyl naphthalene	0.000E+00
0011	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0012	108883	Toluene	Toluene	0.000E+00
0013	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	115071	Propylene	Propylene	0.000E+00
0016	120127	Anthracene	Anthracene	0.000E+00
0017	129000	Pyrene	Pyrene	0.000E+00
0018	191242	B[g,h,i]perylen	Benzo[g,h,i]perylene	0.000E+00
0019	192972	B[e]pyrene	Benzo[e]pyrene	0.000E+00
0020	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0021	198550	Perylene	Perylene	0.000E+00
0022	205992	B[b]fluoranthen	Benzo[b]fluoranthene	0.000E+00
0023	206440	Fluoranthene	Fluoranthene	0.000E+00
0024	207089	B[k]fluoranthen	Benzo[k]fluoranthene	0.000E+00
0025	208968	Acenaphthylene	Acenaphthylene	0.000E+00
0026	218019	Chrysene	Chrysene	0.000E+00
0027	7439921	Lead	Lead	0.000E+00

0028	7439965	Manganese	Manganese	0.000E+00
0029	7439976	Mercury	Mercury	0.000E+00
0030	7440020	Nickel	Nickel	0.000E+00
0031	7440224	Silver	Silver	0.000E+00
0032	7440280	Thallium	Thallium	0.000E+00
0033	7440360	Antimony	Antimony	0.000E+00
0034	7440382	Arsenic	Arsenic	0.000E+00
0035	7440393	Barium	Barium	0.000E+00
0036	7440417	Beryllium	Beryllium	0.000E+00
0037	7440439	Cadmium	Cadmium	0.000E+00
0038	7440473	Chromium	Chromium	0.000E+00
0039	7440508	Copper	Copper	0.000E+00
0040	7440666	Zinc	Zinc	0.000E+00
0041	7723140	Phosphorus	Phosphorus	0.000E+00
0042	7782492	Selenium	Selenium	0.000E+00
0043	7783064	H2S	Hydrogen sulfide	0.000E+00
0044	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0045	7664417	NH3	Ammonia	0.000E+00
0046	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0047	1330207	Xylenes	Xylenes (mixed)	0.000E+00
0048	1151	PAHs-w/o	PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]	0.000E+00
0049	110543	Hexane	Hexane	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF(Inh) (mg/kg-d)^-1	CancerPF(Oral) (mg/kg-d)^-1	ChronicREL(Inh) ug/m^3	ChronicREL(Oral) mg/kg-d	AcuteREL ug/m^3
0001	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0002	50328	B[a]P	3.90E+00	1.20E+01	*	*	*
0003	53703	D[a,h]anthracen	4.10E+00	4.10E+00	*	*	*
0004	56553	B[a]anthracene	3.90E-01	1.20E+00	*	*	*
0005	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0006	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0007	85018	Phenanthrene	*	*	*	*	*
0008	86737	Fluorene	*	*	*	*	*
0009	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0010	91576	2MeNaphthalene	*	*	*	*	*
0011	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0012	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0013	108907	Chlorobenzn	*	*	1.00E+03	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	115071	Propylene	*	*	3.00E+03	*	*
0016	120127	Anthracene	*	*	*	*	*
0017	129000	Pyrene	*	*	*	*	*
0018	191242	B[g,h,i]perylen	*	*	*	*	*
0019	192972	B[e]pyrene	*	*	*	*	*
0020	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0021	198550	Perylene	*	*	*	*	*
0022	205992	B[b]fluoranthen	3.90E-01	1.20E+00	*	*	*
0023	206440	Fluoranthene	*	*	*	*	*
0024	207089	B[k]fluoranthen	3.90E-01	1.20E+00	*	*	*
0025	208968	Acenaphthylene	*	*	*	*	*
0026	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0027	7439921	Lead	4.20E-02	8.50E-03	*	*	*
0028	7439965	Manganese	*	*	9.00E-02	*	*
0029	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01

0030	7440020	Nickel	9.10E-01	*	5.00E-02	5.00E-02	6.00E+00
0031	7440224	Silver	*	*	*	*	*
0032	7440280	Thallium	*	*	*	*	*
0033	7440360	Antimony	*	*	*	*	*
0034	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0035	7440393	Barium	*	*	*	*	*
0036	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0037	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0038	7440473	Chromium	*	*	*	*	*
0039	7440508	Copper	*	*	*	*	1.00E+02
0040	7440666	Zinc	*	*	*	*	*
0041	7723140	Phosphorus	*	*	*	*	*
0042	7782492	Selenium	*	*	2.00E+01	*	*
0043	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0044	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0045	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0046	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0047	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04
0048	1151	PAHs-w/o	3.90E+00	1.20E+01	*	*	*
0049	110543	Hexane	*	*	7.00E+03	*	*

EMISSIONS DATA SOURCE: Emission rates loaded from database
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=1 STK=104 NAME=VALERO REFINERY STACK 104 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	2342.496207	0.267408243
50328	B[a]P	1	0	0.000716018	0.000000081737
53703	D[a,h]anthracen	1	0	0.000716018	0.000000081737
56553	B[a]anthracene	1	0	0.000716018	0.000000081737
71432	Benzene	1	0	39.49877813	0.004508993
75070	Acetaldehyde	1	0	298.3168356	0.034054433
85018	Phenanthrene	1	0	0.021480537	0.00000245212
86737	Fluorene	1	0	0.007160179	0.000000817372
91203	Naphthalene	1	0	4.050269385	0.00046236
91576	2MeNaphthalene	1	0	0.010597065	0.00000120971
100414	Ethyl Benzene	1	0	100.7667503	0.011503054
108883	Toluene	1	0	404.8991527	0.046221364
108907	Chlorobenzn	1	0	5.077567983	0.000579631
108952	Phenol	1	0	202.2788796	0.023091196
115071	Propylene	1	0	89.72570225	0.01024266
120127	Anthracene	1	0	0.000875187	0.000000099907
129000	Pyrene	1	0	0.004868922	0.000000555813
191242	B[g,h,i]perylen	1	0	0.009308233	0.00000106258
192972	B[e]pyrene	1	0	0.000498633	0.000000056921
193395	In[1,2,3-cd]pyr	1	0	0.000716018	0.000000081737
198550	Perylene	1	0	0.000716018	0.000000081737
205992	B[b]fluoranthen	1	0	0.000716018	0.000000081737
206440	Fluoranthene	1	0	0.004868922	0.000000555813
207089	B[k]fluoranthen	1	0	0.000716018	0.000000081737
208968	Acenaphthylene	1	0	0.000716018	0.000000081737
218019	Chrysene	1	0	0.000716018	0.000000081737
7439921	Lead	1	0	0.957674351	0.000109324
7439965	Manganese	1	0	0.668651519	0.0000763301
7439976	Mercury	1	0	0.440801534	0.0000503198

7440020	Nickel	1	0	1.309773847	0.000149518
7440224	Silver	1	0	2.278154777	0.000260063
7440280	Thallium	1	0	8.168632322	0.000932492
7440360	Antimony	1	0	0.731275097	0.0000834789
7440382	Arsenic	1	0	0.086305449	0.00000985222
7440393	Barium	1	0	8.168632322	0.000932492
7440417	Beryllium	1	0	0.012885452	0.00000147094
7440439	Cadmium	1	0	0.031268092	0.00000356942
7440473	Chromium	1	0	0.308831789	0.0000352548
7440508	Copper	1	0	0.631161925	0.0000720504
7440666	Zinc	1	0	20.87817497	0.002383353
7723140	Phosphorus	1	0	0.907485964	0.000103594
7782492	Selenium	1	0	0.310525129	0.0000354481
7783064	H2S	1	0	307.3597102	0.035086725
18540299	Cr(VI)	1	0	0.104511242	0.0000119305
7664417	NH3	1	0	24297.69368	2.773709324
106990	1,3-Butadiene	1	0	1.292461557	0.0000976026
1330207	Xylenes	1	0	192.2499764	0.0000333978
1151	PAHs-w/o	1	0	2.702687264	0.033057385
110543	Hexane	1	0	*	*

EMISSIONS FOR FACILITY FAC=2644 DEV=104 PRO=2 STK=105 NAME=VALERO REFINERY STACK 105 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
50000	Formaldehyde	1	0	*	*
50328	B[a]P	1	0	*	*
53703	D[a,h]anthracen	1	0	*	*
56553	B[a]anthracene	1	0	*	*
71432	Benzene	1	0	*	*
75070	Acetaldehyde	1	0	*	*
85018	Phenanthrene	1	0	*	*
86737	Fluorene	1	0	*	*
91203	Naphthalene	1	0	*	*
91576	2MeNaphthalene	1	0	*	*
100414	Ethyl Benzene	1	0	*	*
108883	Toluene	1	0	*	*
108907	Chlorobenzn	1	0	*	*
108952	Phenol	1	0	*	*
115071	Propylene	1	0	125.34	0.014308
120127	Anthracene	1	0	*	*
129000	Pyrene	1	0	*	*
191242	B[g,h,i]perylen	1	0	*	*
192972	B[e]pyrene	1	0	*	*
193395	In[1,2,3-cd]pyr	1	0	*	*
198550	Perylene	1	0	*	*
205992	B[b]fluoranthen	1	0	*	*
206440	Fluoranthene	1	0	*	*
207089	B[k]fluoranthen	1	0	*	*
208968	Acenaphthylene	1	0	*	*
218019	Chrysene	1	0	*	*
7439921	Lead	1	0	*	*
7439965	Manganese	1	0	*	*
7439976	Mercury	1	0	*	*
7440020	Nickel	1	0	*	*
7440224	Silver	1	0	*	*
7440280	Thallium	1	0	*	*

7440360	Antimony	1	0	*	*
7440382	Arsenic	1	0	*	*
7440393	Barium	1	0	*	*
7440417	Beryllium	1	0	*	*
7440439	Cadmium	1	0	*	*
7440473	Chromium	1	0	*	*
7440508	Copper	1	0	*	*
7440666	Zinc	1	0	*	*
7723140	Phosphorus	1	0	*	*
7782492	Selenium	1	0	*	*
7783064	H2S	1	0	0.45	0.0000513
18540299	Cr(VI)	1	0	*	*
7664417	NH3	1	0	1124	0.128311
106990	1,3-Butadiene	1	0	*	*
1330207	Xylenes	1	0	*	*
1151	PAHs-w/o	1	0	*	*
110543	Hexane	1	0	20.44	0.002334

ACUTE HI REPORT

ACUTE HI, RECEPTOR 634

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	UTME	UTMN
0001	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03		
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0003	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0004	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0005	0.00E+00	0.00E+00	0.00E+00	6.89E-06	0.00E+00	0.00E+00	0.00E+00	6.89E-06	0.00E+00	6.89E-06	0.00E+00	0.00E+00	6.89E-06	6.89E-06		
0006	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-04	0.00E+00	0.00E+00	1.44E-04		
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0008	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0009	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0010	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0011	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0012	0.00E+00	2.48E-06	0.00E+00	2.48E-06	0.00E+00	2.48E-06	0.00E+00	0.00E+00	0.00E+00	2.48E-06	2.48E-06	0.00E+00	0.00E+00	2.48E-06		
0013	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0014	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.91E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.91E-06	0.00E+00	0.00E+00	7.91E-06		
0015	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0016	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0017	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0019	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0020	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0021	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0022	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0023	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0024	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0025	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0027	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0029	0.00E+00	1.67E-04	0.00E+00	1.67E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E-04		
0030	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.95E-05	0.00E+00	0.00E+00	4.95E-05	0.00E+00	0.00E+00	4.95E-05		
0031	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0032	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0033	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		

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0034  9.78E-05 9.78E-05 0.00E+00 9.78E-05 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 9.78E-05
0035  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0036  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0037  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0038  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0039  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.43E-06 0.00E+00 0.00E+00 1.43E-06
0040  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0041  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0042  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0043  0.00E+00 1.79E-03 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 1.79E-03
0044  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0045  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 5.92E-03 0.00E+00 0.00E+00 0.00E+00 0.00E+00 5.92E-03 0.00E+00 0.00E+00 5.92E-03
0046  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0047  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 3.02E-09 0.00E+00 0.00E+00 0.00E+00 0.00E+00 3.02E-09 0.00E+00 0.00E+00 3.02E-09
0048  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
0049  0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
SUM   9.78E-05 2.05E-03 0.00E+00 2.74E-04 0.00E+00 1.57E-02 0.00E+00 5.64E-05 0.00E+00 9.37E-06 6.13E-03 0.00E+00 6.89E-06 1.57E-02 385200
3738100
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