APPENDIX A

NOTICE OF PREPARATION

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South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

SUBJECT: NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT TITLE: CONOCOPHILLIPS LOS ANGELES REFINERY ULTRA LOW SULFUR DIESEL PROJECT

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and will prepare a Draft Environmental Impact Report (EIR) for the project identified above.

The ConocoPhillips Los Angeles Refinery first proposed modifications to produce Ultra Low Sulfur Diesel (ULSD) in 2004 and, pursuant to CEQA, the SCAQMD prepared CEQA documents for the proposed modifications. A Draft EIR is now being prepared for the Project because a decision by the California Supreme Court found certain deficiencies in previously prepared CEQA documents for the ConocoPhillips ULSD Project. Specifically, the court invalidated the baseline used in the previous air quality impact analysis. Therefore, the Draft EIR for the ULSD Project will address the air quality setting and air quality impacts associated with the ULSD Project. Additional information on the legal history of the ULSD project is attached to this cover letter.

The Notice of Preparation (NOP) normally serves two purposes: to solicit information on the scope of the environmental analysis for the ULSD Project and notify the public that the SCAQMD will prepare a Draft EIR to further assess air quality impacts that may have resulted from implementing the ULSD Project. However, as explained above and in the attached pages, in response to a California Supreme Court decision on previous CEQA documents for the ULSD project, the analysis will focus only on the air quality setting and impacts from the project.

The attached NOP is not an SCAQMD application or form requiring a response from you. The purpose of the NOP is simply to provide information to you on the above project. If the ULSD Project has no bearing on you or your organization, no action on your part is necessary. The project's description and location are described in the attached NOP.

Comments focusing on your area of expertise, your agency's area of jurisdiction, or issues relative to the air quality setting and impacts analysis should be addressed to Mr. Jeff Inabinet at the address shown above, sent by FAX to (909) 396-3324, or e-mailed to jinabinet@aqmd.gov. Comments must be received no later than 5:00 p.m. on April 26, 2012. Please include the name and phone number of the contact person for your organization.

Project Applicant: ConocoPhillips Los Angeles Refinery

Date: March 23, 2012 **Signature:** Steve Smith

Steve Smith, Ph.D.
Program Supervisor
Planning, Rule Development and Area Sources

Reference: California Code of Regulations, Title 14, Sections 15082, 15103, and 15375

LEGAL HISTORY OF THE CONOCOPHILLIPS ULSD PROJECT

On July 16, 2004, two lawsuits were filed challenging the SCAQMD's certification of the 2004 Final Negative Declaration and Addendum and approval of an SCAQMD permit for the ULSD Project (California Superior Court, Los Angeles County, Case Nos. BS091275 and BS091276). These lawsuits asserted that, among other things, an environmental impact report should have been prepared to review the impacts associated with the ConocoPhillips ULSD Project. The petitioners sought a preliminary injunction or stay to prevent Project construction during the pendency of the lawsuits; however, the court denied these requests. The lawsuits were amended following certification of a 2005 Subsequent Negative Declaration to add claims associated with that CEQA document and associated air permits issued by the SCAQMD. The trial occurred in two phases. Phase I challenged the SCAQMD's decision to prepare the Negative Declaration and Addendum. The Phase II trial was held a year later and challenged the Subsequent Negative Declaration, as well as SCAQMD's decision not to apply its Regulation XVII permitting program. Following each trial, the Los Angeles Superior Court concluded that the SCAQMD was correct on all counts. More specifically, the court concluded that the 2004 Final Negative Declaration, the 2004 Addendum, and the 2005 Final Subsequent Negative Declaration all complied with CEQA and that the permitting decisions complied with law. On June 29, 2006, the Superior Court entered Judgment. CBE and Valdez et al. filed notices of appeal in August 2006.

On appeal, plaintiffs argued substantial evidence that supported a fair argument that the Project would have a significant environmental impact on air quality, requiring the SCAQMD to prepare an EIR. On January 16, 2008, the Court of Appeal upheld the decision of the Superior Court on all claims but one. In the Court's opinion, an improper baseline was used to evaluate air quality impacts during operations. It concluded that the increased use of existing equipment should have been evaluated as part of the ULSD Project, not as part of the baseline, and, that if the proper baseline had been used, there was substantial evidence supporting a fair argument of significant NOx emissions, requiring preparation of an EIR. The SCAQMD filed a Petition for Review to the California Supreme Court on February 25, 2008, in which ConocoPhillips joined. The Petition sought review only of the portion of the Appellate Court's decision concerning baseline for evaluation of air quality impacts, and no other portion of the opinion was challenged by any party. On April 16, 2008, the Supreme Court granted review of the case.

On March 15, 2010, the Supreme Court concluded that the environmental impacts of a proposed Project must be compared to the environmental conditions that exist at the time the CEQA analysis is commenced, not the level of development or activity that would be allowed under existing permits or approvals. Because the ULSD Project may require increased utilization of existing boilers and other steam generating equipment, it was inconsistent with CEQA to use the maximum permitted operating capacity of this utility equipment as the baseline against which to compare NOx emissions from the proposed Project, rather than an estimate of the actual NOx emissions from the equipment under current operating conditions. Therefore, the SCAQMD is preparing an EIR for the ConocoPhillips ULSD Project to respond to the findings of the Supreme Court.

The Supreme Court left to the discretion of the SCAQMD the methodology for estimating the "actual existing levels of emissions" from the utility equipment. The Court explained:

> "The District and ConocoPhillips emphasized that refinery operations are highly complex and that these operations, including the steam generation system, vary greatly with the season, crude oil supplies, market conditions, and other factors. . . .

> "We do not attempt here to answer any technical questions as to how existing refinery operations should be measured for baseline purposes in this case or how similar baseline conditions should be measured in future cases. CEQA Guidelines section 15125 (Cal. Code Regs., tit. 14, § 15125, subd. (a) directs that the lead agency 'normally' use a measure of physical conditions 'at the time the notice of preparation [of an EIR] is published, or if no notice of preparation is published, at the time environmental analysis is commenced.' But, as one appellate court observed, 'the date for establishing baseline cannot be a rigid one. Environmental conditions may vary from year to year and in some cases it is necessary to consider conditions over a range of time periods.' . . . In some circumstances, peak impacts or recurring periods of resource scarcity may be as important environmentally as average conditions. Where environmental conditions are expected to change quickly during the period of environmental review for reasons other than the proposed project, project effects might reasonably be compared to predicted conditions at the expected date of approval, rather than to conditions at the time analysis is begun. . . A temporary lull or spike in operations that happens to occur at the time environmental review for a new project begins should not depress or elevate the baseline; overreliance on short term activity averages might encourage companies to temporarily increase operations artificially, simply in order to establish a higher baseline.
>
> "Neither CEQA nor the CEQA Guidelines mandates a uniform, inflexible rule for determination of the existing conditions baseline. Rather, the agency enjoys the discretion to decide, in the first instance, exactly how the existing physical conditions without the project can most realistically be measured, subject to review, as with all CEQA factual determinations, for support by substantial evidence."

The Court observed that the SCAQMD had previously calculated NOx emissions from the proposed ULSD Project. However, it also stated that the SCAQMD is not required to use the same measurement method in the EIR that was used in the Negative Declaration. "Whatever method the District uses, however, the comparison must be between existing physical conditions without the Diesel Project and the conditions expected to be produced by the project."

It should be noted that neither the Court of Appeal decision nor the Supreme Court decision invalidated any aspect of the prior CEQA documents except for the baseline used in the air quality impacts analysis. Other aspects of the prior CEQA documents were challenged in the litigation, but those challenges were rejected by the trial court, and the trial court's rulings were upheld on appeal. Therefore, the Draft EIR for the ULSD Project will be focused on the issues as directed by the court and will be limited to air quality setting and impacts from project operations.

The Refinery modifications proposed as part of the ULSD Project have been completed and ConocoPhillips has been producing ULSD at its Los Angeles Refinery since 2006, as required by these regulations. However, applying the court's decision, an EIR is required for the ConocoPhillips ULSD Project to address air quality impacts from the proposed project. Thus, the SCAQMD need not evaluate further impacts to other environmental topic areas from the project. Consequently, the SCAQMD will not prepare an initial study and has begun preparing the EIR in response to direction by the Court.

PROJECT OBJECTIVES

The project objectives for the ConocoPhillips ULSD Project were developed to comply with federal, state and SCAQMD regulations that limit the sulfur content of diesel fuels and are

included below as part of this notice. Reducing the sulfur content of diesel fuel leads to a reduction of sulfur oxides (SOx) and particulate sulfate emissions from sources (such as vehicles and trucks) that use the fuel. The objectives of the ULSD Project are the following:

- Reduce the sulfur content of diesel fuel produced at the Los Angeles Refinery.
- Comply with SCAQMD's Rule 431.2 which required a reduction in sulfur content in diesel fuel used in stationary sources to 15 ppmw.
- Comply with CARB's 2000 Diesel Risk Reduction Plan to reduce exposure to diesel particulate matter.
- Comply with the U.S. EPA's diesel fuel standards that required refiners to sell highway diesel fuel that meets a maximum sulfur standard of 15 ppmw.

PUBLIC RESOURCES CODE §21092.6 – LIST RELATING TO HAZARDOUS WASTE

Government Code §65962.5 refers to the "Hazardous Waste and Substances Site List", which is a list of facilities that may be subject to the Resource Conservation and Recovery Act (RCRA) corrective action program. Neither the ConocoPhillips Wilmington Plant nor the Carson Plant are included on the list prepared by the Department of Toxic Substances Control (DTSC) pursuant to Government Code §65962.5 (DTSC, 2012). Nonetheless, the ConocoPhillips Carson Plant is included on a list of RCRA-permitted sites that require corrective action as identified by DTSC (DTSC, 2012). Furthermore, both plants are subject to corrective action under the "Spills, Leaks, Investigation & Cleanup (SLIC) Program" administered by the Los Angeles Regional Water Quality Control Board pursuant to California Water Code §13304. In order to provide full public disclosure per CEQA (Public Resources Code §21092.6) with regard to corrective actions required by local agency, the following information is provided:

Applicant:	**ConocoPhillips Carson Plant**
Address:	1520 East Sepulveda Boulevard, Carson, CA 90745
Phone:	(310) 522-9300
Address of Site:	1520 East Sepulveda Boulevard, Carson, CA 90745
Local Agency:	City of Carson
Assessor's Book:	7315-002-021
List:	DTSC and SLIC Corrective Action
SLIC Case No:	0232

Applicant:	**ConocoPhillips Wilmington Plant**
Address:	1660 West Anaheim Street, Wilmington, CA 90748
Phone:	(310) 952-6000
Address of Site:	1660 West Anaheim Street, Wilmington, CA 90748
Local Agency:	City of Los Angeles
Assessor's Book:	7412-015-003; 7412-022-008, 009 & 010; 7412-024-033 & 006; 7412-025-008
List:	SLIC Corrective Action
SLIC Case No:	0231

CONCLUSION

No court decision invalidated any aspect of the prior CEQA documents except for the baseline used in the air quality impacts analysis for project operations. Other aspects of the prior CEQA documents were challenged in the litigation, but those challenges were rejected by the trial court, and the trial court's rulings were upheld on appeal. Therefore, the analysis of impacts in the Draft EIR for the ULSD Project will be limited to air quality setting and impacts from project operations, as directed by the court.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, California 91765-4182

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Project Title:
ConocoPhillips Los Angeles Refinery Ultra Low Sulfur Diesel Project

Project Location:
The ConocoPhillips Los Angeles Refinery operates at two locations: the ConocoPhillips Carson Plant is located at 1520 East Sepulveda Boulevard, Carson, California, 90745. The ConocoPhillips Wilmington Plant is located at 1660 West Anaheim Street, Wilmington, CA 90744. The Ultra Low Sulfur Diesel Project is located at the Los Angeles Wilmington Plant.

Description of Nature, Purpose, and Beneficiaries of Project:
The ConocoPhillips ULSD project was developed to comply with the federal, state and SCAQMD regulations that limit the sulfur content of diesel fuels. The project includes the following activities: 1) modifications to Hydrotreater Unit 90; 2) replacement of an existing charge heater with a functionally identical replacement heater; 3) installation of a Selective Catalytic Reduction Unit to control NOx emissions from the replacement heater, with aqueous ammonia supplied from an existing aqueous ammonia storage tank; 4) demolition of an existing cooling tower and replacement with a new cooling tower of the same capacity; 5) minor modifications to the mid barrel handling and shipping system including a new jet shipping pump, two new pumps for handling jet and diesel blendstocks, and one new sample pump and associated piping to create separate facilities for handling jet and diesel fuel; 6) minor modifications to the hydrogen distribution system including new hydrogen distribution piping; 7) and modifications to one storage tank to allow a change of service (i.e., contents). In response to the court's decision on the 2004 Final Negative Declaration and Addendum, an EIR is required for the ConocoPhillips ULSD Project to address air quality impacts only from the proposed project.

Lead Agency:	**Division:**
South Coast Air Quality Management District	Planning, Rule Development and Area Sources

Initial Study and all Supporting Documentation are Available at:

SCAQMD Headquarters
21865 Copley Drive
Diamond Bar, CA 91765

Or by Calling:
(909) 396-2039

The Initial Study is also available by accessing:
http://aqmd.gov/ceqa/nonaqmd.html

The Notice of Preparation is provided through the following:

☑ Los Angeles Times (March 28, 2012)	☑ Daily Breeze (March 28, 2012)	☑ SCAQMD Website
☑ SCAQMD Public Information Center	☑ Interested Parties	☑ SCAQMD Mailing List

Review Period:
March 28, 2012 through April 26, 2012

CEQA Contact Person:	**Phone Number:**	**E-Mail Address**
Jeff Inabinet	(909) 396-2453	jinabinet@aqmd.gov

APPENDIX B

AIR EMISSION CALCULATIONS

Modifications to the emission calculations have been made in the Final EIR due to responses to comments. The SCAQMD has evaluated the modifications and concluded that none of the modifications alter the conclusions reached in the Draft EIR, nor provide new information of substantial importance relative to the draft document that would require recirculation of the Draft EIR pursuant to CEQA Guidelines §15073.5. Additions to the text and emission calculations are denoted using underline. Text that has been eliminated is shown using ~~strikeouts~~. Several new tables were added and these are identified under the titles.

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Appendix B

Phillips 66
Ultra Low Sulfur Diesel Project

Operational Emissions Summary - Average

Source	Estimated Emissions (lbs/day)					
	CO	**VOC**	**NOx**	**SOx**	**PM10**	**PM2.5**
Pre-Project (Baseline)						
Stationary Sources						
Fugitives						
Pumps	0.00	4.41	0.00	0.00	0.00	0.00
Compressors	0.00	2.82	0.00	0.00	0.00	0.00
Valves	0.00	64.49	0.00	0.00	0.00	0.00
Flanges	0.00	12.44	0.00	0.00	0.00	0.00
Process Drains	0.00	10.74	0.00	0.00	0.00	0.00
Heater B-201	22.64	4.53	30.50	2.50	4.85	4.85
Total Pre-Project (Baseline) Emissions	**22.64**	**99.42**	**30.50**	**2.50**	**4.85**	**4.85**
Post-Project						
Stationary Sources						
Fugitives						
Pumps	0.00	4.41	0.00	0.00	0.00	0.00
Compressors	0.00	2.82	0.00	0.00	0.00	0.00
Valves	0.00	66.16	0.00	0.00	0.00	0.00
Flanges	0.00	15.09	0.00	0.00	0.00	0.00
Process Drains	0.00	11.62	0.00	0.00	0.00	0.00
Heater B-401	6.04	5.44	4.96	4.19	5.83	5.83
Tank 331		0.20				
Average Incremental Increase from Sulfur Recovery Plant	5.77	0.81	3.40	0.38	0.61	0.61
Off-site Sources						
Average Hydrogen Production	2.28	2.28	3.50	0.10	2.73	2.73
Delivery Trucks	2.38	0.32	3.05	0.03	0.05	0.05
Net Electricity Production	4.12	0.21	23.70	2.47	0.82	0.82
Total Post-Project Emissions	**20.59**	**109.35**	**38.60**	**7.17**	**10.04**	**10.04**
Net Emissions Increases	**-2.05**	**9.93**	**8.10**	**4.67**	**5.19**	**5.19**

Net Emissions Increases = Post-Project Emissions - Pre-Project Emissions (Baseline)

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Phillips 66
Ultra Low Sulfur Diesel Project

Operational Emissions Summary - Worst-Case
(NOTE: This table in a new table that has been added to the Final EIR)

Source	Estimated Emissions (lbs/day)					
	CO	VOC	NOx	SOx	PM10	PM2.5
Pre-Project (Baseline)						
Stationary Sources						
Fugitives						
Pumps	0.00	4.41	0.00	0.00	0.00	0.00
Compressors	0.00	2.82	0.00	0.00	0.00	0.00
Valves	0.00	64.49	0.00	0.00	0.00	0.00
Flanges	0.00	12.44	0.00	0.00	0.00	0.00
Process Drains	0.00	10.74	0.00	0.00	0.00	0.00
Heater B-201	22.64	4.53	30.50	2.50	4.85	4.85
Total Pre-Project (Baseline) Emissions	**22.64**	**99.42**	**30.50**	**2.50**	**4.85**	**4.85**
Post-Project						
Stationary Sources						
Fugitives						
Pumps	0.00	4.41	0.00	0.00	0.00	0.00
Compressors	0.00	2.82	0.00	0.00	0.00	0.00
Valves	0.00	66.16	0.00	0.00	0.00	0.00
Flanges	0.00	15.09	0.00	0.00	0.00	0.00
Process Drains	0.00	11.62	0.00	0.00	0.00	0.00
Heater B-401	6.04	5.44	4.96	4.19	5.83	5.83
Tank 331		0.20				
Peak Incremental Increase from Sulfur Recovery Plant	5.77	0.81	19.78	0.38	0.61	0.61
Off-site Sources						
Peak Hydrogen Production	6.26	6.26	9.60	0.27	7.49	7.49
Delivery Trucks	2.38	0.32	3.05	0.03	0.05	0.05
Net Electricity Production	4.12	0.21	23.70	2.47	0.82	0.82
Total Post-Project Emissions	**24.56**	**113.32**	**61.08**	**7.34**	**14.80**	**14.80**
Net Emissions Increases	**1.93**	**13.91**	**30.58**	**4.84**	**9.95**	**9.95**

Net Emissions Increases = Post-Project Emissions - Pre-Project Emissions (Baseline)

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Phillips 66
Ultra Low Sulfur Diesel Project

Unit 90 Fugitive Emissions

Component/ Control		Service[1]	EF[2] lb/yr/ source	Pre-Project (Baseline)[3]			Post-Project[4]			Change		
				Count	lb/yr	lb/day	Count	lb/yr	lb/day	Count	lb/yr	lb/day
Pumps	Sealless	LL	0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
	Mechanical seal	LL	104	7	728.0	2.0	7	728.0	2.0	0	0.0	0.0
	Mechanical seal	HL	80	11	880.0	2.4	11	880.0	2.4	0	0.0	0.0
Compressors		G/V	514	2	1028.0	2.8	2	1028.0	2.8	0	0.0	0.0
Valves	Bellows sealed	G/V/LL	0	17	0.0	0.0	243	0.0	0.0	226	0.0	0.0
	Approved I&M prog.(< 500 ppm)	G/V	23	712	16376.0	44.9	746	17158.0	47.0	34	782.0	2.1
	Approved I&M prog.(< 500 ppm)	LL	19	377	7163.0	19.6	368	6992.0	19.2	-9	-171.0	-0.5
PSVs	Closed vent system	G/V/LL	0	18	0.0	0.0	17	0.0	0.0	-1	0.0	0.0
Flanges		G/V/LL	1.5	1426	2139.0	5.9	1584	2376.0	6.5	158	237.0	0.6
Connections		G/V/LL	1.5	1488	2232.0	6.1	1923	2884.5	7.9	435	652.5	1.8
Others		G/V/LL	1.5	113	169.5	0.5	164	246.0	0.7	51	76.5	0.2
Process Drains			80	49	3920.0	10.7	53	4240.0	11.6	4	320.0	0.9
Total						**94.9**			**100.1**			**5.2**

(1) G = gas, V = vapor, LL = light liquid, HL = heavy liquid

(2) Emission Factors from the Jay Chen Memo, BACT/LAER for Valves as VOC Fugitive Sources, April 2, 1999.

(3) Based on actual component counts prior to the Project (Baseline).

(4) Based on as-built survey following completion of the Project..

Approach: The Project resulted in changes to the number of components in the unit, which would potentially increase fugitive VOC emissions. Fugitive emissions components are required to be monitored under Rule 1173 and accurate component counts are available. Potential increases in emissions would be those emissions associated with the increase in the number of a particular type of component. Project Impact = Post-Project - Pre-Project (Baseline).

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Ultra Low Sulfur Diesel Project

Heater Emissions Change

Heater B-201 (Baseline)[1]

	CO	VOC	NOx*	SOx*	PM10	PM2.5
Emission Factors	35	7	*	*	7.5	7.5
Emissions (lbs/day)	22.6	4.5	30.5	2.5	4.9	4.9

*NOx and SOx emissions are based on actual emissions from RECLAIM data.

Heater B-401 (Project)[2]

	CO	VOC	NOx	SOx	PM10	PM2.5
Emission Factor (lb/mmscf)		7			7.5	7.5
Emission Factor (lb/hr)	0.25		0.21			
Emission Factor (lb/mmBtu)				0.0051		
Emissions (lbs/day)	6.04	5.4	4.96	4.19	5.83	5.83
Emissions (tonnes/yr)						

	CO	VOC	NOx	SOx	PM10	PM2.5
Total Emissions Change (lbs/day)	-16.60	0.91	-25.54	1.69	0.98	0.98

(1) Heater B-201 emissions are peak emissions during 2002 and 2003 (baseline) and are based on a maximum firing rate of 679.1 mm Btu/day @1050 btu/scf.
(2) Heater B-401 emissions (Project) based on maximum duty of 34 mmBtu/hr using permit-limitted emission factors or SCAQMD default factors, as appropriate.

PROJECT EMISSION CALCULATIONS:

Approach: Heater B-201 was removed and replaced with Heater B-401, which has the same firing rate, 34 mmBtu/hr, as B-201. During 2002 and 2003, B-201 did not operate at the maximum rated capacity on a daily basis. Therefore, the emissions for the peak operating day were used to evaluate the increase in emissions associated with the ULSD Project.

Emission Calculation for CO (lbs/hr) = CONC x O x SV x Fd x FF

CONC	10 ppmv	CO Concentration
O	20.9%/(20.9%-3%)	Correction for 3% oxygen
SV	28.01 lb/lb-mol)/385.3 dscf/lb-mol)	Specific molar volume
Fd	8710 dscf/mmBtu	Dry Fuel Factor for gas
FF	34 mm Btu/hr	Fuel Flow Rate

Emission Calculation for NOx (lbs/hr) = CONC x O x SV x Fd x FF

CONC	5 ppmv	NOx Concentration
O	20.9%/(20.9%-3%)	Correction for 3% oxygen
SV	46.01 lb/lb-mol)/385.3 dscf/lb-mol)	Specific molar volume
Fd	8710 dscf/mmBtu	Dry Fuel Factor for gas
FF	34 mm Btu/hr	Fuel Flow Rate

Emission Calculation for SOx (lbs/hr) = x CONC/HHV/SV x MW x HD

CONC	40 ppm	Sulfur Concentration
HHV	1316 Btu/scf	High heat value
SV	379 dscf/lb-mol	Specific molar volume as SO2
MW	64.07 lb/lb-mole	Molecular weight
HD	34 mm Btu/hr	Heater Duty

Emission Calculation for VOC, PM10, PM2.5 = EF x 24/HH x FF

EF	Emission Factor (lb/mmscf) (7 for VOC and 7.5 PM10/PM2.5)
24	Operating Hours Per Day
HH	High heating value (1050 mmscf/Btu)
FF	Fuel Flow Rate (34 mmBtu/hr)

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Ultra Low Sulfur Diesel Project

Hydrogen Production

Hydrogen Production Demand from Proposed Project

	Average Actual Production[3] (mmscf/yr)[1]	Maximum Actual Production (mmscf/yr)[2]
Pre-Project	3,686.50	4,788.80
Post-Project	4,197.50	6,190.40
Incremental Change (mmscf/year)	511.00	1,401.60
Incremental Change (mmscf/day)	1.40	3.84

Emissions Associated with Hydrogen Production

	CO	VOC	NOx	SOx	PM10	PM2.5[1]
Emission Factor (lb/mmscf)[2]	1.63	1.63	2.5	0.07	1.95	1.95
Average Actual Emissions (lbs/day)	2.28	2.28	3.50	0.10	2.73	2.73
Peak Actual Emissions (lbs/day)	6.26	6.26	9.60	0.27	7.49	7.49

(1) PM2.5 emissions are assumed to be equivalent to PM10 emissions.

(2) City of Carson, EIR for the Air Products Hydrogen Facility and Specialty Gas Facility (SCH# 97071078), June 15, 1998.

(3) Approach: The average actual hydrogen demand for Units 89 and 90 combined was compared from 2002-2003 and 2006-2008. The increase was attributed to U90 solely to ensure the worst-case demand was attributed to the ULSD project.

(4) Approach: The actual peak day hydrogen demand for Units 89 and 90 combined was compared from 2002-2003 (13.12 mmscf on June 26, 2002) and 2006-2008 (16.96 mmscf on October 23, 2007). The peak increase from those days was assumed to occur for the entire year and attributed to U90 solely to ensure the worst-case demand was attributed to the ULSD project (3.84 mmscf/day x 365 days = 1,401.6 mmscf/yr).

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Ultra Low Sulfur Diesel Project

Electricity Production

Electricity Demand

	Power (hp)	Power (MWh)
Pre-Project (Baseline)	640	0.5
Post-Project	1711	1.3
~~Post-Project~~	~~1675~~	~~1.2~~
Electricity due to Increased Sulfur at the SRP(3)		0.1

Electricity Generation Emissions

	CO	VOC	NOx	SOx	PM10	PM2.5(2)
Pre-Project Emission Factor (lbs/MW-hr)(1)	0.2	0.01	1.15	0.12	0.04	0.04
Post-Project Emission Factor (lbs/MW-hr)(1)	0.2	0.01	1.15	0.12	0.04	0.04
Pre-Project (Baseline) Emissions (lbs/day)	2.3	0.1	13.2	1.4	0.5	0.5
Post-Project Emissions (lbs/day)	6.1	0.3	35.2	3.7	1.2	1.2
Emissions from SRP Electricity (lbs/day)	0.3	0.0	1.7	0.2	0.1	0.1
~~**Net Emissions (lbs/day)**~~	~~**3.7**~~	~~**0.2**~~	~~**34.5**~~	~~**3.6**~~	~~**1.2**~~	~~**1.2**~~
Net Emissions (lbs/day)	**4.1**	**0.2**	**23.7**	**2.5**	**0.8**	**0.8**

(1) Source: SCAQMD CEQA Air Quality Handbook, Table A9-11-B (SCAQMD, 1993)

(2) PM2.5 emissions assumed to be equivalent to PM10 emissions.

(3) Electricity = 0.3 kW-hr/lb H2S x 5,083 lb/day = 1524 kw-hr/day

1524 kw-hr/day x (1 day/24 hr) x (1 MW/1,000 kw) = 0.06 MWh

Appendix B

Phillips 66
Ultra Low Sulfur Diesel Project

Incremental Emissions from Increased Sulfur Generation
(NOTE: This table in a new table that has been added to the Final EIR)

Sulfur Plant - Increased Fuel Use 0.02 mmscf

	CO	VOC	NOx	SOx	PM10	PM2.5
Emission Factor (lb/mmscf)[1]	35	7	99.2	0.83	7.5	7.5
Emissions (lbs/day)	0.73	0.15	2.06	0.02	0.16	0.16

(1) Emission factors are based on the SCAQMD's default emission factors for the combustion of natural gas in heaters as described in the Annual Emissions Report Program. NOx emission factor is from RECLAIM monitoring data.

Approach: Based on the material balance for the Unit 90 ULSD project, design feed to the unit is 402,690 lbs/hr.
Therefore: Incremental Sulfur = 402,690 lbs/hr x (50-5)/1,000,000 = 199.3 lbs/hr or 4,784 lbs/day sulfur.
Incremental H2S = 4,874 lbs/day x 34/32 = 5,083 lbs/day or 211.8 lbs/hr H_2S
Fuel Gas = 0.0041 MSCF/lb H_2S x 5,083 lb/day = 20.8 MSCFD or 0.02 mmscfd
Therefore, the increased emissions from the Sulfur Plant are based on the maximum throughput of Unit 90.
Therefore, the emissions estimates are for a peak operating day.

SULFUR PLANT - INCREASED STEAM USE: 0.06 mmscf/day

Worst-Case Emissions Increase - Boiler 4

	CO	VOC	NOx	SOx	PM10	PM2.5
Emission Factor (lb/mmscf)[1]	84	11	295.2	6	7.5	7.5
Emissions (lbs/day)	5.04	0.7	17.71	0.36	0.45	0.45

(1) Emission factors are based on the SCAQMD's default emission factors for the combustion of natural gas in heaters as described in the Annual Emissions Report Program. NOx emission factor is from RECLAIM monitoring data.

Average Emissions Increase - Boiler 7

	CO	VOC	NOx	SOx	PM10	PM2.5
Emission Factor (lb/mmscf)[1]	84	11	22.2	6	7.5	7.5
Emissions (lbs/day)	5.04	0.7	1.33	0.36	0.45	0.45

(1) Emission factors are based on the SCAQMD's default emission factors for the combustion of natural gas in heaters as described in the Annual Emissions Report Program or SCAQMD permit limits.

APPROACH:
Increased boiler firing = [3,007 lb/hr steam x (1204.6-195.2) Btu/lb]/0.8 = 3.8 mm btu/hr
Where:
Enthalpy of 400 psi saturate steam = 1204.6 Btu/lb
Enthalpy of boiler feedwater at 227oF = 195.2 Btu/lb (heated with recovered energy)
Boiler effiency = 80%
Increased fuel use = 3.8 btu/hr x scf/1528.6 btu x 24 hr/day = 0.06 mmscf/day
Where:
Average HHV or RFG post project = 1528.6 Btu/scf

SULFUR PLANT - TOTAL EMISSION INCREASES:

	CO	VOC	NOx	SOx	PM10	PM2.5
Average Emissions (lbs/day)	5.77	0.81	3.40	0.38	0.61	0.61
Worst Case Emissions (lbs/day	5.77	0.81	19.78	0.38	0.61	0.61

Appendix B

Phillips 66
Ultra Low Sulfur Diesel Project

Vehicle Emissions

On Road Mobile Emission Factors from California ARB EMFAC2002 Scenario Year 2004 (Model Years A11965 to 2004)

Vehicle Type	CO Emissions Factor (lb/mile)	VOC Emission Factor (lb/mile)	NOx Emissions Factor (lb/mile)	SOx Emissions Factor (lb/mile)	PM10 Emissions Factor (lb/mile)	PM2.5 Emissions Factor (lb/mile)(1)
Workers Commuting	0.016559	0.001771	0.0018	0.00001	0.000079	0.000079
Light Duty Trucks	0.016559	0.001771	0.0018	0.00001	0.000079	0.000079
Bus	0.02309	0.003148	0.029607	0.000243	0.000519	0.000519
Heavy Diesel Trucks	0.02309	0.003148	0.029607	0.000243	0.000519	0.000519

Source	Parameters			Peak Day Emissions, lbs/day					
	Number of Vehicles	Total Number of Trips	Distance Traveled	CO	VOC	NOx	SOx	PM10	PM2.5
Workers Commuting	0	0	16.2	0.00	0.00	0.00	0.00	0.00	0.00
On-site Cars	0	0	10	0.00	0.00	0.00	0.00	0.00	0.00
Light Duty Trucks	0	0	16.2	0.00	0.00	0.00	0.00	0.00	0.00
Buses	0	0	1.5	0.00	0.00	0.00	0.00	0.00	0.00
Daily Delivery Trucks(2)	1	2	50	2.31	0.31	2.96	0.02	0.05	0.05
Sulfur Trucks(3)	1	1	3	0.07	0.01	0.09	0.00	0.00	0.00
~~**Total Vehicle Emisions**~~				~~11.55~~	~~1.57~~	~~14.80~~	~~0.12~~	~~0.26~~	~~0.26~~
Total Vehicle Emisions				2.38	0.32	3.05	0.03	0.05	0.05

(1) PM2.5 emissions assumed to be equivalent to PM10 emissions.

(2) Based on 1 ammonia delivery ~~and catalyst change out requiring 4 trucks per day for 14 days (5 total trucks on the peak day)~~. It was determined that there were no increase in catalyst trucks.

(3) Increase in sulfur trucks is calculated to be a maximum of 35.4 trucks per year. Peak day assumes 1 sulfur truck.

TANKS 4.0
Emissions Report - Summary Format
Tank Identification and Physical Characteristics

Identification

User Identification:	Tank 331 (ULSD)
City:	Wilmington
State:	California
Company:	ConocoPhillips
Type of Tank:	External Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	120.00
Volume (gallons):	3,444,000.00
Turnovers:	14.24

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition:	Good

Roof Characteristics

Type:	Double Deck
Fitting Category:	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal:	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Drain (3-in. Diameter)/Open	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	34
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1

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

TANKS 4.0
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F) Avg.	Min.	Max.	Liquid Bulk Temp. (deg F)	Vapor Pressures (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Unifined Heavy Cat Gas	All	66.43	60.99	71.87	64.33	0.0100	N/A	N/A	68.0000			108.00	Option 1: VP60 = .01 VP70 = .01

TANKS 4.0
Emissions Report - Summary Format
Individual Tank Emission Totals

Annual Emissions Report

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Unifined Heavy Cat Gas	4.36	77.10	1.84	0.00	83.31

APPENDIX C

HEALTH RISK ASSESSMENT

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Phillips 66 Los Angeles Refinery
Wilmington Plant
Health Risk Analysis
Ultra Low Sulfur Diesel Project

January 11, 2013

Prepared for: Phillips 66 Los Angeles Refinery – Wilmington Plant
Prepared by: Environmental Audit, Inc.
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FACILITY INFORMATION

The Phillips 66 Los Angeles Refinery – Wilmington Plant (Refinery) is located at 1660 W. Anaheim Street, Wilmington, California (see Figure 1). The Refinery processes crude oil into marketable products including gasoline, diesel fuel, jet fuel, and other products. The Refinery is bordered by a residential area, a roofing materials plant, and a portion of the Harbor 110 Freeway to the east; the Ken Malloy Harbor Regional Park, Harbor College, Harbor Park Municipal Golf Course, and a small residential area to the north; Gaffey Street including a firing range, vacant fields, recreational fields, and a U.S. Navy fuel storage facility to the west; and, a warehouse facility to the south. The closest resident is adjacent to the eastern Refinery property boundary. The South Coast Air Quality Management District (AQMD) identification number for the facility is 171107.

INTRODUCTION

Following legal challenge, the California Supreme Court concluded that there were certain deficiencies in previously prepared CEQA documents for the Phillips 66 ULSD Project and required the South Coast AQMD to prepare an EIR to analyze the air quality impacts of the Project. As a result, a Draft Environmental Impact Report (EIR) is now being prepared for the ULSD Project as required by the California Supreme Court to correct deficiencies identified in the Court's decision. However, the Refinery modifications proposed as part of the ULSD Project have been completed and Phillips 66 has been producing ULSD at its Los Angeles Refinery since 2006, as required by federal, state, and South Coast AQMD ULSD regulations.

As part of the CEQA process, Environmental Audit Inc. (EAI) has performed a health risk analysis for the ULSD Project. EAI has calculated emissions to evaluate the maximum potential impacts of toxic air contaminants (TACs) associated with the improvements from the ULSD Project. The physical modifications in Unit 90, as a result of the Project, included replacing Heater B-201 with Heater B-401 and an increase in the number of fugitive components (i.e., valves, flange, pumps, etc.) in Unit 90. Therefore, to determine the project health risk has been determined by comparing the health risks associated with Heater B-201 before the project with the health risks associated with Heater B-401 and the incremental increase in fugitive emissions in Unit 90 as a result of the ULSD Project.

Based on information provided by Phillips 66, the USLD Project has been modeled as the net difference between the previously existing Unit 90 Heater B-201 (U90B201) and replacement Heater B-401 (U90B401) and associated fugitives (U90FUG). The previously existing U90B201 was modeled as a point source (See Figure 2). The replacement U90B401 and U90FUG were modeled as a point source and a volume source, respectively (See Figure 3). The incremental health risk for the ULSD Project is the net difference between the pre-project and post-project health risk.

TACs in the emissions from the sources are included in the South Coast AQMD Rule 1401 – New Source Review for Toxic Air Contaminants. The health risks were evaluated using the South Coast

AQMD *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 26 chemicals which are chemicals listed in Attachment I of the South Coast AQMD Rule 1401 Guidelines – 12 are considered carcinogens, 22 are considered to have adverse chronic health effects, and 11 are considered to have adverse acute health effects (See Attachment B).

EMISSION ESTIMATES

The emissions estimates of TACs from the heaters are calculated using emission factors from a source test. Fugitive emissions are based on the refinery specific speciation of Unit 90. The emission factors used for emission sources are from the *2012 ConocoPhillips Company Los Angeles Refinery - Wilmington Plant AB 2588 Revision F 2006-2007* (ConocoPhillips, 2012) and *the 2001 Tosco Los Angeles Refinery Wilmington Plant AB2588 HRA* (Tosco, 2001). The calculated emissions are presented in Attachment A.

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 ULSD Project. The HARP model (CARB, 2005) combines the 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 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 HARP model incorporates US EPA Industrial Source Complex as the dispersion model, however, AERMOD is now the preferred dispersion model, and therefore, this analysis utilizes HARP On-Ramp to import groundlevel concentrations from AERMOD into HARP. The model default values were modified to conform to the South Coast AQMD Supplement Guidelines for Preparing Risk Assessment for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) (South Coast AQMD, 2005).

The pre-project analysis is modeled as a single point source (U90B201). The post-project analysis is modeled as a point source (U90B401) and a volume source (U90FUG). The source parameters are listed in Attachment C. The locations of the sources were identified based on data provided by Phillips 66 and the Torrance USGS Quadrangles (see attached Figure 2 and 3).

The receptors used in the model include a fenceline receptor grid and a fine receptor grid. The Refinery is located on a hillside; therefore, terrain variations were included for the receptor networks. The fenceline receptor grid (maximal spacing every 100 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. The pre-project and post-project analyses used identical receptor grids. Figures 2 and 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 Attachment D. The applicable output results from the HARP model are in Attachment E.

PRE-PROJECT RISK ANALYSIS

Cancer Risk Analysis

Under the pre-project or baseline case, the maximum cancer risk from Unit 90 Heater B-201 for an exposed individual resident (MEIR) is located approximately 260 east of the Refinery (No. 861, UTM Coordinates 381700, 3737600, See Figure 2). The cancer risk is 7.35×10^{-8} or 0.07 cancer cases in one million at the MEIR. Hexavalent chromium contributes approximately 75.5 percent of the calculated cancer risk at the MEIR. The inhalation pathway accounts for 84.4 percent of the cancer risk. Detailed cancer risk contributions by pathway and pollutants are presented in Attachment D.

The maximum exposed incremental cancer risk at an occupational exposure (MEIW) is located approximately 100 meters east of the Refinery (No. 788, UTM Coordinates 382500, 3737400, See Figure 2). The incremental cancer risk is 1.89×10^{-8} or 0.02 cancer cases in one million at the MEIW. Hexavalent chromium contributes approximately 67.7 percent of the calculated cancer risk at the MEIW. The inhalation pathway accounts for 75.7 percent of the cancer risk. Detailed cancer risk contributions by pathway and pollutants are presented in Attachment D.

Non-Cancer Risk Analysis

Under the pre-project or baseline case, the maximum chronic hazard index (MCHI) total for Unit 90 Heater B-201 for the respiratory system is 0.0028. The MCHI is located approximately 100 meters east of the Refinery (No. 788, UTM Coordinates 382500, 3737400, See Figure 2). Arsenic contributes approximately 97.2 percent of the calculated MCHI. Detailed contribution by pollutant to the chronic hazard index for the maximum receptor location is presented in Attachment D.

The maximum acute hazard index (MAHI) total for the central nervous system is 0.0001. The MAHI is located on the eastern boundary of the Refinery (No. 778, UTM Coordinates 381500, 3737400, See Figure 2). Arsenic contributes approximately 90.3 percent of the calculated MAHI. Detailed contribution by pollutant to the acute hazard index for the maximum receptor location is presented in Attachment D.

POST-PROJECT RISK ANALYSIS

Cancer Risk Analysis

Under the post-project case, the maximum cancer risk from Unit 90 Heater B-401 and associated fugitives for the MEIR is located approximately 260 meters east of the Refinery (No. 861, UTM Coordinates 381700, 3737600, See Figure 3). The cancer risk is 1.50×10^{-7} or 0.15 cancer cases in one million at the MEIR. Hexavalent chromium contributes approximately 48.1 percent of the calculated cancer risk at the MEIR. The inhalation pathway accounts for 59.1 percent of the cancer risk. Detailed cancer risk contributions by pathway and pollutants are presented in Attachment D.

The MEIW is located approximately 100 meters east of the Refinery (No. 788, UTM Coordinates 382500, 3737400, See Figure 3). The incremental cancer risk is 2.81 x 10^{-8} or 0.03 cancer cases in one million at the MEIW. Hexavalent chromium contributes approximately 58.7 percent of the calculated cancer risk at the MEIW. The inhalation pathway accounts for approximately 68.0 percent of the cancer risk. Detailed cancer risk contributions by pathway and pollutants are presented in Attachment D.

Non-Cancer Risk Analysis

Under the post-project case, the maximum chronic hazard index (MCHI) total for Unit 90 Heater B-401 and associated fugitives for the respiratory system is 0.0037. The MCHI is located approximately 100 meters east of the Refinery (No. 788, UTM Coordinates 382500, 3737400, See Figure 3). Arsenic contributes approximately 96.4 percent of the calculated MCHI. Detailed contribution by pollutant to the chronic hazard index for the maximum receptor location is presented in Attachment D.

The maximum acute hazard index (MAHI) total for the central nervous system is 0.0001. The MAHI is located at the northwestern boundary of the Refinery (No. 1933, UTM Coordinates 380641, 3738324, See Figure 3). Arsenic contributes approximately 90.3 percent of the calculated MAHI. Detailed contribution by pollutant to the acute hazard index for the maximum receptor location is presented in Attachment D.

INCREMENTAL RISK ANALYSIS

As shown in Table D-1 in Attachment D, the incremental cancer risk of the ULSD Project is 7.65 x 10^{-8} (0.15-0.07) or 0.08 per million at the MEIR and 9.20 x 10^{-9} (0.03-0.02) or 0.01 per million at the MEIW. Table D-1 in Attachment D also shows the incremental MCHI is 0.0008. The acute risk for the replacement heater is at a different location from the previous heater, therefore, the acute risk for U90 B-201 cannot be subtracted from the new acute risk value. The acute risk value for the ULSD project is 0.0001. The health risks for the TACs emitted from the ULSD Project are below the significance threshold of ten cancer cases per one million for cancer risk and chronic and acute hazard indices are below the 1.0 non-cancer risk significance thresholds.

CONCLUSIONS

The health risks for the TACs emitted from the USLD Project are below the significance threshold of ten cancer cases in one million for cancer risk and chronic and acute hazard indices are below the 1.0 non-cancer risk significance threshold established under CEQA. Therefore, cancer risk and hazard index thresholds for the ULSD Project are not expected to be exceeded at any receptor location.

REFERENCES

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

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Tosco, 2001. *Tosco Los Angeles Refinery Wilmington Plant AB2588 HRA, 2001.*

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FIGURES

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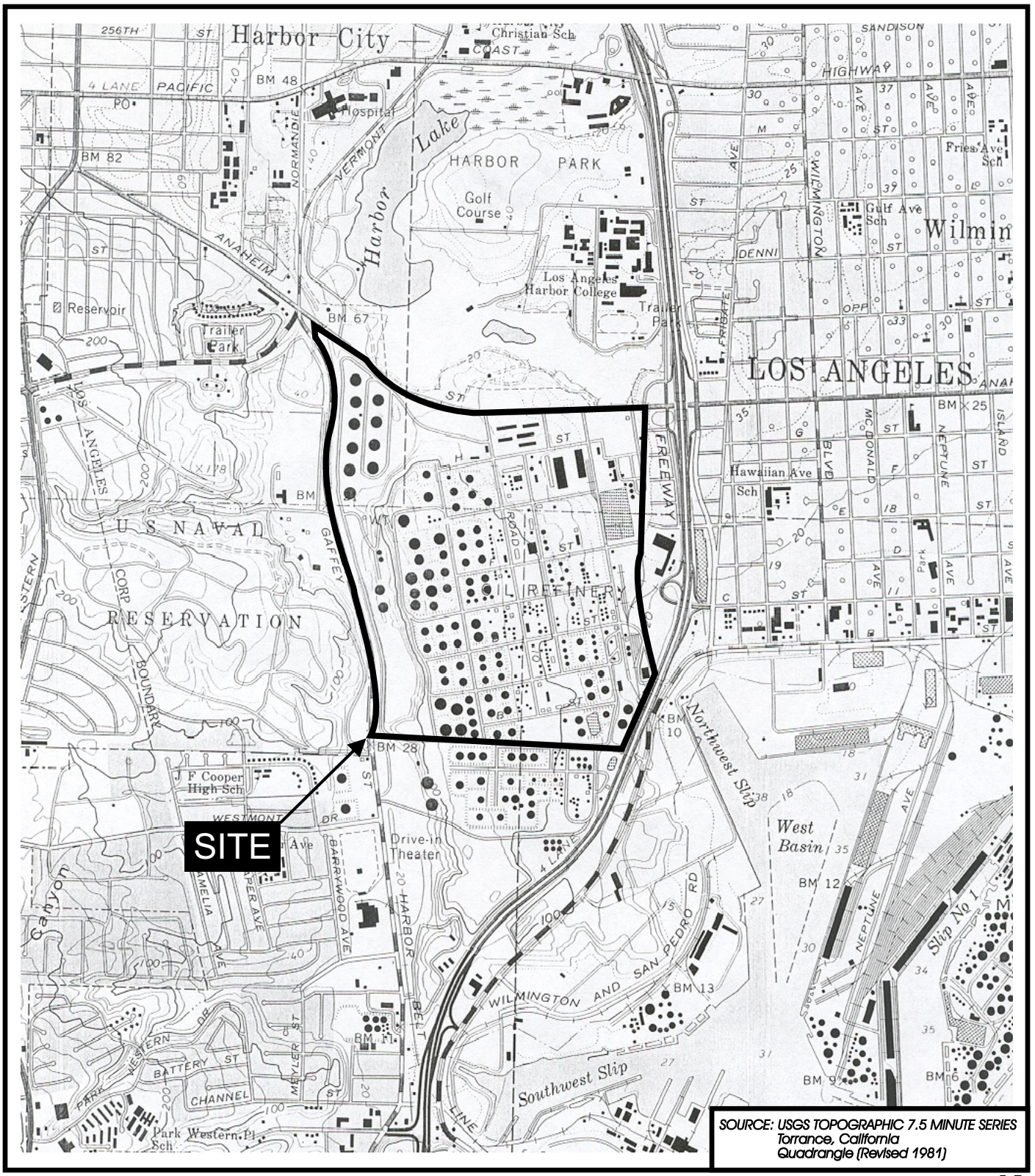

Environmental Audit, Inc.

FIGURE 1
SITE LOCATION MAP
Phillips 66 Los Angeles Refinery
Wilmington Plant

Project No. 2696

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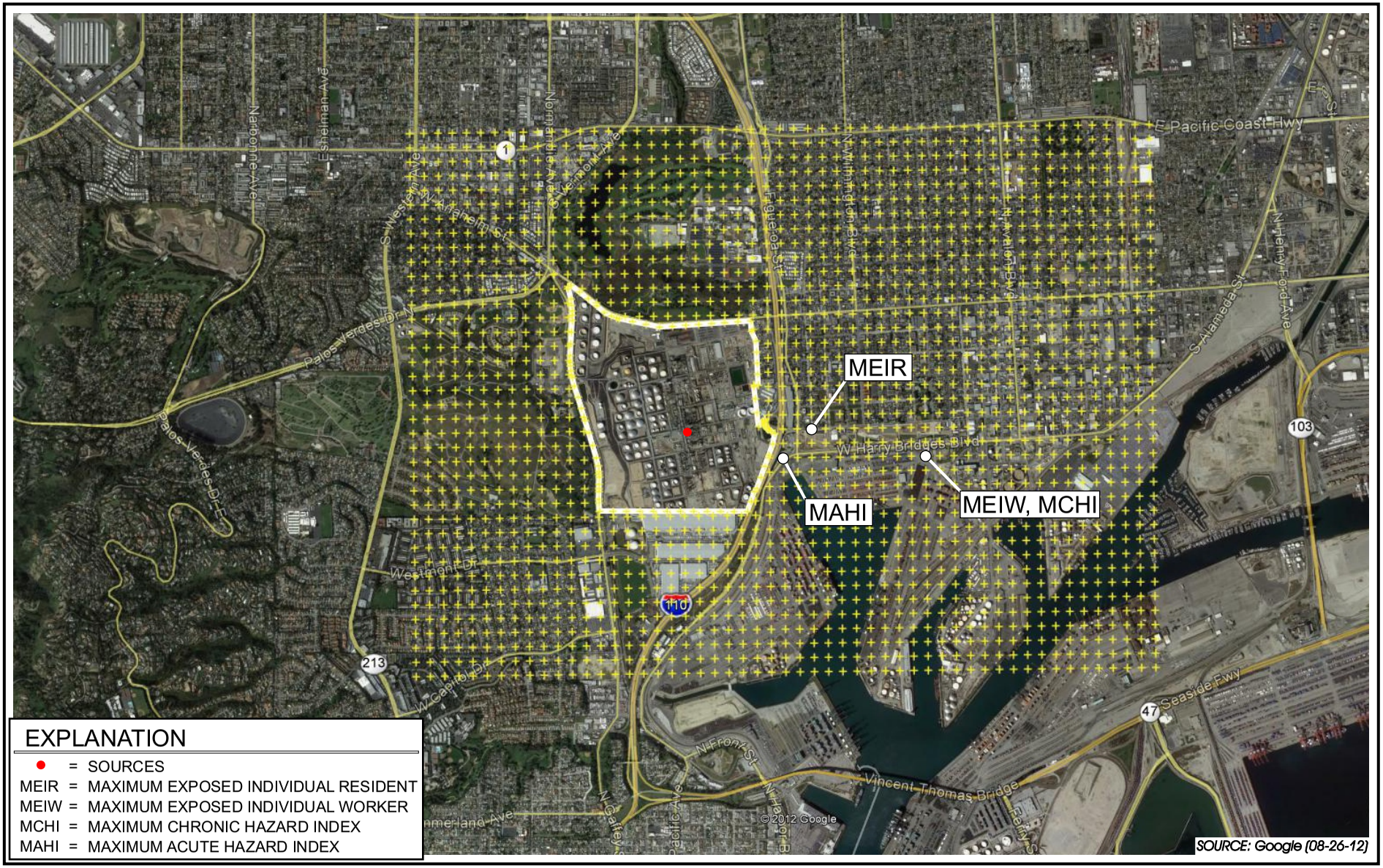

ENVIRONMENTAL AUDIT, INC.

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FIGURE 2
PRE-PROJECT - MAX IMPACT LOCATION MAP
Phillips 66 Los Angeles Refinery
Wilmington Plant

Project No. 2696

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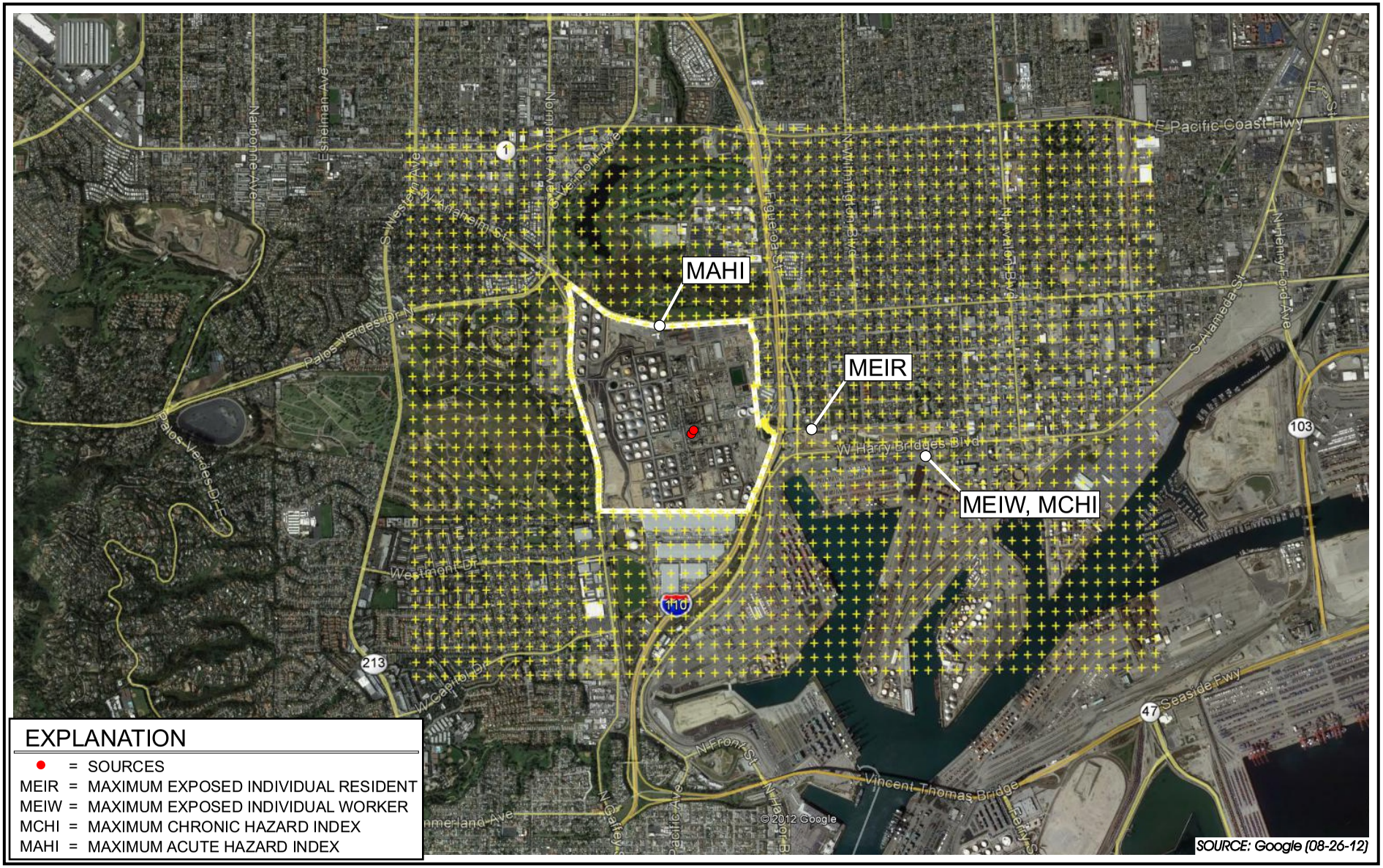

ENVIRONMENTAL AUDIT, INC.

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FIGURE 3
POST-PROJECT - MAX IMPACT LOCATION MAP
Phillips 66 Los Angeles Refinery
Wilmington Plant

Project No. 2696
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ATTACHMENT A

Emission Calculations

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Attachment A
Phillips 66 - Wilmington Plant
ULSD Project
Table A-1
Pre-Project Heater 201 Emissions

Process Equipment Description:	U90 B-201 Htr
Fuel Type:	Refinery Fuel
Process Units:	MMCF
Control Equipment:	Low NOx Burner
Control Type:	HLNX
Estimation Method:	Source Testing
Yearly Emis. Est. Equation:	F_y x EF
Max Hourly Emis. Est. Equation:	F_m x EF

Parameter Symbols/Names	**Values**	
F_y = Total Yearly Amount of Fuel Burned	188.35	MMCF/yr
F_m = Maximum Hourly Amount of Fuel Burned	0.02	MMCF/hr
EF = Source Test Emission Factor	(see below)	lbs/MMCF
Process Operation Schedule	24	hours/day
	7	days/week
	52	weeks/year
Refinery Fuel Gas HHV	1316	btu/scf
Firing Rate	679.1	mmbtu/day

Emittent Species Name [1]	**Emittent ID (CAS Number)**	**Rule 1401**	**Emission Factor** [2] **(lbs/MMCF)**	**Annual Avg Emissions (lbs/yr)**	**Hourly Max Emissions (lbs/hr)**
Acenaphthene	83329		4.74E-06	8.93E-04	1.02E-07
Acenaphthylene	208968		3.00E-06	5.65E-04	6.45E-08
Acetaldehyde	75070	Y	1.00E-02	1.89E+00	2.15E-04
Anthracene	120127		5.10E-06	9.61E-04	1.10E-07
Antimony	7440360		1.53E-03	2.88E-01	3.29E-05
Arsenic	7440382	Y	1.00E-03	1.89E-01	2.16E-05
Barium	7440393		ND	ND	ND
Benz (a) Anthracene	56553	Y	ND	ND	ND
Benzene	71432	Y	1.32E-02	2.49E+00	2.85E-04
Benzo (a) Pyrene	50328	Y	ND	ND	ND
Benzo (b) Fluoranthene	205992	Y	ND	ND	ND
Benzo (g,h,i) perylene	191242	Y	ND	ND	ND
Benzo (k) Fluoranthene	207089	Y	ND	ND	ND
Beryllium	7440417	Y	2.69E-04	5.06E-02	5.77E-06
Cadmium	7440439	Y	6.59E-04	1.24E-01	1.42E-05
Chromium (Hexavalent)	18540299	Y	4.29E-04	8.08E-02	9.22E-06
Chromium (Total)	7440473		5.37E-04	1.01E-01	1.15E-05
Chrysene	218019	Y	ND	ND	ND
Copper	7440508	Y	ND	ND	ND
Dibenz (a, h) Anthracene	53703	Y	ND	ND	ND
Fluoranthene	206440		5.79E-06	1.09E-03	1.24E-07
Fluorene	86737		2.63E-05	4.94E-03	5.64E-07
Formaldehyde	50000	Y	6.11E-05	1.15E-02	1.31E-06
Hydrogen Sulfide	7783064	Y	1.44E-02	2.72E+00	3.11E-04
Indeno (1, 2, 3-cd) Pyrene	193395	Y	5.60E-07	1.05E-04	1.20E-08
Lead	7439921	Y	ND	ND	ND
Manganese	7439965	Y	4.40E-03	8.28E-01	9.45E-05
Mercury	7439976	Y	1.01E-04	1.89E-02	2.16E-06
Naphthalene	91203	Y	3.26E-04	6.13E-02	7.00E-06
Nickel	7440020	Y	ND	ND	ND
PAHs	1150	Y	4.02E-04	7.57E-02	8.64E-06
Phenanthrene	85018		2.03E-05	3.81E-03	4.35E-07
Phenol	108952	Y	7.77E-04	1.46E-01	1.67E-05
Phosphorous	7723140		4.49E-03	8.45E-01	9.64E-05
Pyrene	129000		1.18E-05	2.22E-03	2.53E-07
Selenium	7782492	Y	2.69E-03	5.06E-01	5.77E-05
Silver	7440224	Y	5.37E-04	1.01E-01	1.15E-05
Thallium	7440280		1.88E-03	3.53E-01	4.03E-05
Toluene	108883	Y	1.58E-02	2.97E+00	3.39E-04
Zinc	7440666		1.34E-02	2.52E+00	2.88E-04

[1] PAHs present the total of Acenaphthene, Acenaphthylene, Anthracene, Benz(a)Anthracene, Benzo(a)Pyrene, Benzo(b)Fluoranthene, Benzo(g,h,i)Perylene, Benzo(k)Fluoranthene, Chrysene, Dibenzo(a,b)Anthracene, Fluoroanthene, Fluorene, Indeno(1,2,3-cd)Pyrene, Naphthalene, Phenanthrene, and Pyrene.

[2] Emission factors provided by Unocal were derived from a source test conducted on process heater unit 100 (heater equipped with low NOx burner) on December 15-22, 1992 with the exception to the factors for Benzene, Hydrogen Sulfide, Phenol, and Toluene, where the emission factors were derived from WSPA, Low NOx process heater burning refinery gas, tested on June 2, 1992, pg.30.

ND = Non-detect for all three test runs.

Attachment A
Phillips 66 - Wilmington Plant
ULSD Project
Table A-2
Post-Project Heater 401 Emissions

Process Equipment Description:	U90 B-401 Htr
Fuel Type:	Refinery Fuel
Process Units:	MMCF
Control Equipment:	Low NOx Burner & SCR
Control Type:	HLNX & SCR
Estimation Method:	Source Testing
Yearly Emis. Est. Equation:	F_y x EF
Max Hourly Emis. Est. Equation:	F_m x EF

Parameter Symbols/Names	**Values**	
F_y = Total Yearly Amount of Fuel Burned	226.32	MMCF/yr
F_m = Maximum Hourly Amount of Fuel Burned	0.03	MMCF/hr
EF = Source Test Emission Factor	(see below)	lbs/MMCF
Process Operation Schedule	24	hours/day
	7	days/week
	52	weeks/year
Refinery Fuel Gas HHV	1316	btu/scf
Firing Rate	34	mmbtu/hr

Emittent Species Name [1]	Emittent ID (CAS Number)	Rule 1401	Emission Factor [2] (lbs/MMCF)	Annual Avg Emissions (lbs/yr)	Hourly Max Emissions (lbs/hr)
Acenaphthene	83329		5.06E-06	1.14E-03	1.31E-07
Acenaphthylene	208968		3.20E-06	7.24E-04	8.27E-08
Acetaldehyde	75070	Y	1.07E-02	2.42E+00	2.76E-04
Ammonia (lb/hr)	7664417	Y	1.07E-01	9.38E+02	1.07E-01
Anthracene	120127		5.44E-06	1.23E-03	1.41E-07
Antimony	7440360		1.63E-03	3.69E-01	4.22E-05
Arsenic	7440382	Y	1.07E-03	2.42E-01	2.77E-05
Barium	7440393		ND	ND	ND
Benz (a) Anthracene	56553	Y	ND	ND	ND
Benzene	71432	Y	1.41E-02	3.20E+00	3.65E-04
Benzo (a) Pyrene	50328	Y	ND	ND	ND
Benzo (b) Fluoranthene	205992	Y	ND	ND	ND
Benzo (g,h,i) perylene	191242	Y	ND	ND	ND
Benzo (k) Fluoranthene	207089	Y	ND	ND	ND
Beryllium	7440417	Y	2.86E-04	6.48E-02	7.40E-06
Cadmium	7440439	Y	7.02E-04	1.59E-01	1.81E-05
Chromium (Hexavalent)	18540299	Y	4.58E-04	1.04E-01	1.18E-05
Chromium (Total)	7440473		5.73E-04	1.30E-01	1.48E-05
Chrysene	218019	Y	ND	ND	ND
Copper	7440508	Y	ND	ND	ND
Dibenz (a, h) Anthracene	53703	Y	ND	ND	ND
Fluoranthene	206440		6.18E-06	1.40E-03	1.60E-07
Fluorene	86737		2.80E-05	6.34E-03	7.23E-07
Formaldehyde	50000	Y	6.51E-05	1.47E-02	1.68E-06
Hydrogen Sulfide	7783064	Y	1.54E-02	3.49E+00	3.98E-04
Indeno (1, 2, 3-cd) Pyrene	193395	Y	5.97E-07	1.35E-04	1.54E-08
Lead	7439921	Y	ND	ND	ND
Manganese	7439965	Y	4.69E-03	1.06E+00	1.21E-04
Mercury	7439976	Y	1.07E-04	2.43E-02	2.77E-06
Naphthalene	91203	Y	3.47E-04	7.86E-02	8.97E-06
Nickel	7440020	Y	ND	ND	ND
PAHs	1150	Y	4.29E-04	9.70E-02	1.11E-05
Phenanthrene	85018		2.16E-05	4.89E-03	5.58E-07
Phenol	108952	Y	8.29E-04	1.88E-01	2.14E-05
Phosphorous	7723140		4.78E-03	1.08E+00	1.24E-04
Pyrene	129000		1.25E-05	2.84E-03	3.24E-07
Selenium	7782492	Y	2.86E-03	6.48E-01	7.40E-05
Silver	7440224	Y	5.73E-04	1.30E-01	1.48E-05
Thallium	7440280		2.00E-03	4.53E-01	5.17E-05
Toluene	108883	Y	1.68E-02	3.80E+00	4.34E-04
Zinc	7440666		1.43E-02	3.23E+00	3.69E-04

[1] PAHs present the total of Acenaphthene, Acenaphthylene, Anthracene, Benz(a)Anthracene, Benzo(a)Pyrene, Benzo(b)Fluoranthene, Benzo(g,h,i)Perylene, Benzo(k)Fluoranthene, Chrysene, Dibenzo(a,b)Anthracene, Fluoroanthene, Fluorene, Indeno(1,2,3-cd)Pyrene, Naphthalene, Phenanthrene, and Pyrene.

[2] Emission factors provided by Unocal were derived from a source test conducted on process heater unit 100 (heater equipped with low NOx burner) on December 15-22, 1992 with the exception to the factors for Benzene, Hydrogen Sulfide, Phenol, and Toluene, where the emission factors were derived from WSPA, Low NOx process heater burning refinery gas, tested on June 2, 1992, pg.30.
Ammonia emissions were based on the permitted limit of 5 ppmv with flue gas rate of 1258 lb-mole/hr.

ND = Non-detect for all three test runs.

Attachment A
Phillips 66 - Wilmington Plant
ULSD Project
Table A-3
Post-Project Incremental Fugitive Emissions

Emittent Species Name	Emittent ID (CAS Number)	Rule 1401	Emission Factor [1] (lb/lb VOC)	Annual Avg Emissions (lbs/yr)	Daily Avg Emissions (lbs/day)	Hourly Max Emissions (lbs/hr)
Total VOC	NA	NA	NA	1898.00	5.20	0.22
1,2,4-Trimethylbenzene	95636		2.21E-03	4.19E+00	1.15E-02	1.31E-06
1,3-Butadiene	106990	Y	1.17E-04	2.23E-01	6.10E-04	6.96E-08
2,2,4-Trimethylpentane	540841		6.46E-04	1.23E+00	3.36E-03	3.84E-07
Benzene	71432	Y	1.59E-04	3.02E-01	8.28E-04	9.45E-08
Chrysene	218019	Y	3.52E-05	6.68E-02	1.83E-04	2.09E-08
Cumene	98828		2.37E-04	4.50E-01	1.23E-03	1.41E-07
Cyclohexane	110827		3.97E-04	7.54E-01	2.06E-03	2.36E-07
Ethylbenzene	100414	Y	5.05E-04	9.59E-01	2.63E-03	3.00E-07
Ethylene	74851	Y	1.17E-04	2.23E-01	6.10E-04	6.96E-08
Hexane	110543	Y	2.11E-03	4.01E+00	1.10E-02	1.25E-06
Hydrogen Sulfide	7783064	Y	7.81E-06	1.48E-02	4.06E-05	4.64E-09
Indeno[1,2,3-cd]pyrene	193395	Y	1.76E-04	3.34E-01	9.15E-04	1.04E-07
m-Cresol	108394	Y	3.52E-05	6.68E-02	1.83E-04	2.09E-08
m-Xylene	108383	Y	7.70E-04	1.46E+00	4.01E-03	4.57E-07
Naphthalene	91203	Y	1.70E-03	3.22E+00	8.83E-03	1.01E-06
o-Cresol	95487	Y	3.52E-05	6.68E-02	1.83E-04	2.09E-08
o-Xylene	95476	Y	7.39E-04	1.40E+00	3.84E-03	4.39E-07
p-Cresol	106445	Y	3.52E-05	6.68E-02	1.83E-04	2.09E-08
Phenol	108952	Y	3.52E-05	6.68E-02	1.83E-04	2.09E-08
Propylene	115071	Y	1.17E-04	2.23E-01	6.10E-04	6.96E-08
p-Xylene	106423	Y	7.70E-04	1.46E+00	4.01E-03	4.57E-07
Styrene	100425	Y	1.32E-04	2.50E-01	6.86E-04	7.83E-08
Toluene	108883	Y	6.38E-04	1.21E+00	3.32E-03	3.79E-07
Xylenes, mixed	1210	Y	2.28E-03	4.33E+00	1.19E-02	1.35E-06

(1) Speciation from 2001 Tosco AB2588 HRA for Unit 90.

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ATTACHMENT B
Health Risk Tables

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Attachment B
Phillips 66 - Wilmington Plant
ULSD Project
Health Data

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	*	*
Acetaldehyde	75070	1.00E-02	*	140	*	470
Arsenic	1016	12	1.5	0.015	0.0000035	0.2
Benzene	71432	1.00E-01	*	60	*	1300
Beryllium	7440417	8.4	*	0.007	0.002	*
Cadmium	7440439	15	*	0.02	0.0005	*
Chrysene	218019	0.039	0.12	*	*	*
Chromium (VI)	18540299	5.10E+02	*	0.2	0.02	*
Cresols	1319773	*	*	600	*	*
Ethyl Benzene	100414	0.0087	*	2000	*	*
Formaldehyde	50000	0.021	*	9.00E+00	*	55
Hydrogen Sulfide	7783064	*	*	1.00E+01	*	42
Hexane	110543	*	*	7000	*	*
Indeno[1,2,3-cd]pyrene	193395	3.90E-01	1.20E+00	*	*	*
Manganese	7439965	*	*	9.00E-02	*	*
Mercury	7439976	*	*	3.00E-02	0.00016	0.6
Naphthalene	91203	0.12	*	9	*	*
Ammonia	7664417	*	*	200	*	3200
PAHs	1150	*	*	*	*	*
Phenol	108952	*	*	200	*	5800
Propylene	115071	*	*	3000	*	*
Selenium	7782492	*	*	2.00E+01	*	*
Silver	7440224	*	*	*	*	*
Styrene	100425	*	*	900	*	21000
Toluene	108883	*	*	300	*	37000
Xylenes	1330207	*	*	700	*	22000

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

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ATTACHMENT C

Source Parameters

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Attachment C
Phillips 66 - Wilmington Plant
ULSD Project
Source Parameters

Source Name	UTME (m)	UTMN (m)	Length (m)	Width (m)	Height (m)	Diameter (m)	Velocity (m/s)	Temp (F)
U90B201	380844	3737597			45.73	1.43	1.092	785
U90B401	380870	3737598			45.73	1.43	1.092	785
U90FUG	380560	3737580	70	70	1.83			

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ATTACHMENT D

Detailed Risk Tables

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Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-1
HRA Risk Summary

Scenario	MEIR	MEIW	MCHI	MAHI
Pre-Project	7.35E-08	1.89E-08	2.82E-03	1.24E-04
Post-Project	1.50E-07	2.81E-08	3.66E-03	1.45E-04
Incremental Risk	**7.65E-08**	**9.20E-09**	**8.40E-04**	**1.45E-04**

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-2
Pre-Project Maxium Exposed Individual Resident

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Acetaldehyde	2.54E-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	2.54E-11
Arsenic	3.05E-09	7.31E-09	3.56E-09	0.00E+00	0.00E+00	0.00E+00	6.54E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-08	1.46E-08
Benzene	3.35E-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	3.35E-10
Beryllium	5.72E-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	5.72E-10
Cadmium	2.50E-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	2.50E-09
Chromium(VI)	5.55E-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	5.55E-08
Formaldehyde	3.25E-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	0.00E+00	0.00E+00	0.00E+00	3.25E-13
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno[1,2,3-cd]pyrene	4.95E-14	6.58E-13	9.86E-14	0.00E+00	0.00E+00	0.00E+00	8.35E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-12	1.64E-12
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	9.90E-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	0.00E+00	0.00E+00	0.00E+00	9.90E-12
PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	6.20E-08	7.31E-09	3.56E-09	0.00E+00	0.00E+00	0.00E+00	6.54E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-08	7.35E-08

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Acetaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arsenic	4.1%	9.9%	4.8%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	19.9%
Benzene	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Beryllium	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Cadmium	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%
Chromium(VI)	75.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	75.5%
Formaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hydrogen Sulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Indeno[1,2,3-cd]pyrene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Manganese	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mercury	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Naphthalene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PAHs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phenol	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Selenium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Silver	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUM	84.4%	9.9%	4.8%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.6%	100.0%

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

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-3
Pre-Project Maxium Exposed Individual Worker

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Acetaldehyde	5.87E-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	0.00E+00	0.00E+00	0.00E+00	5.87E-12
Arsenic	7.04E-10	3.24E-09	1.37E-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	4.61E-09	5.32E-09
Benzene	7.73E-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	7.73E-11
Beryllium	1.32E-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	1.32E-10
Cadmium	5.78E-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	5.78E-10
Chromium(VI)	1.28E-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	1.28E-08
Formaldehyde	7.50E-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	0.00E+00	0.00E+00	0.00E+00	7.50E-14
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno[1,2,3-cd]pyrene	1.27E-14	2.92E-13	3.79E-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	3.30E-13	3.43E-13
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	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	0.00E+00	0.00E+00	0.00E+00	2.28E-12
PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	1.43E-08	3.24E-09	1.37E-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	4.61E-09	1.89E-08

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
Acetaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arsenic	3.7%	17.1%	7.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.4%	28.1%
Benzene	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Beryllium	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%
Cadmium	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%
Chromium(VI)	67.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	67.7%
Formaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hydrogen Sulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Indeno[1,2,3-cd]pyrene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Manganese	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mercury	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Naphthalene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PAHs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phenol	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Selenium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Silver	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUM	75.7%	17.1%	7.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.4%	100.0%

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

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-4
Pre-Project Maxium Chronic Hazard Index

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	CNS
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	7.34E-08	0.00E+00	0.00E+00	7.34E-08	**0.0%**
Arsenic	2.74E-03	**2.74E-03**	0.00E+00	2.74E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-03	2.74E-03	0.00E+00	2.74E-03	**97.2%**
Benzene	0.00E+00	**2.26E-07**	0.00E+00	2.26E-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	2.26E-07	2.26E-07	**0.0%**
Beryllium	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.53E-07	3.93E-05	0.00E+00	0.00E+00	3.93E-05	0.00E+00	0.00E+00	3.93E-05	**0.0%**
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	5.03E-05	0.00E+00	3.37E-05	0.00E+00	0.00E+00	5.03E-05	**0.0%**
Chromium(VI)	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E-06	0.00E+00	1.04E-07	2.20E-06	**0.0%**
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	6.94E-09	0.00E+00	0.00E+00	6.94E-09	**0.0%**
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-06	0.00E+00	0.00E+00	1.48E-06	**0.0%**
Manganese	0.00E+00	**5.00E-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	5.00E-05	**1.8%**
Mercury	0.00E+00	**2.28E-05**	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-05	**0.8%**
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	3.70E-08	0.00E+00	0.00E+00	3.70E-08	**0.0%**
PAHs	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**0.0%**
Phenol	3.97E-09	**3.97E-09**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-09	0.00E+00	3.97E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-09	**0.0%**
Selenium	1.37E-07	**1.37E-07**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-07	**0.0%**
Toluene	0.00E+00	**5.38E-08**	0.00E+00	5.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.38E-08	0.00E+00	0.00E+00	5.38E-08	**0.0%**
SUM	2.74E-03	**2.82E-03**	0.00E+00	2.77E-03	0.00E+00	0.00E+00	7.94E-07	3.93E-05	7.31E-05	0.00E+00	2.82E-03	2.74E-03	3.29E-07	2.82E-03	**100.0%**

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-5
Pre-Project Maxium Acute Hazard Index

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	CNS
Acetaldehyde	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	4.75E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-07	0.00E+00	0.00E+00	4.75E-07	**0.0%**
Arsenic	1.12E-04	**1.12E-04**	0.00E+00	1.12E-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	1.12E-04	**90.3%**
Benzene	0.00E+00	**0.00E+00**	0.00E+00	2.28E-07	0.00E+00	0.00E+00	0.00E+00	2.28E-07	0.00E+00	2.28E-07	0.00E+00	0.00E+00	2.28E-07	2.28E-07	**0.0%**
Formaldehyde	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	2.48E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-08	**0.0%**
Hydrogen Sulfide	0.00E+00	**7.70E-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	0.00E+00	0.00E+00	0.00E+00	7.70E-06	**6.2%**
Mercury	0.00E+00	**3.74E-06**	0.00E+00	3.74E-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	0.00E+00	3.74E-06	**3.0%**
Phenol	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	2.99E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.99E-09	0.00E+00	0.00E+00	2.99E-09	**0.0%**
Toluene	0.00E+00	**9.52E-09**	0.00E+00	9.52E-09	0.00E+00	9.52E-09	0.00E+00	0.00E+00	0.00E+00	9.52E-09	9.52E-09	0.00E+00	0.00E+00	9.52E-09	**0.0%**
SUM	1.12E-04	**1.24E-04**	0.00E+00	1.16E-04	0.00E+00	5.13E-07	0.00E+00	2.28E-07	0.00E+00	2.37E-07	4.88E-07	0.00E+00	2.28E-07	1.24E-04	**100.0%**

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-6
Post-Project Maxium Exposed Individual Resident

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
1,3-Butadiene	1.62E-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	1.62E-09
Acetaldehyde	3.29E-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	3.29E-11
Arsenic	3.95E-09	9.44E-09	4.60E-09	0.00E+00	0.00E+00	0.00E+00	8.44E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-08	1.88E-08
Benzene	7.99E-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	7.99E-10
Beryllium	7.39E-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	7.39E-10
Cadmium	3.24E-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	3.24E-09
Chrysene	2.82E-11	3.75E-10	5.62E-11	0.00E+00	0.00E+00	0.00E+00	4.76E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E-10	9.36E-10
Chromium(VI)	7.21E-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	7.21E-08
Cresols	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	1.01E-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	1.01E-10
Formaldehyde	4.19E-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	0.00E+00	0.00E+00	0.00E+00	4.19E-13
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno[1,2,3-cd]pyrene	1.41E-09	1.88E-08	2.81E-09	0.00E+00	0.00E+00	0.00E+00	2.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-08	4.68E-08
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	4.68E-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	4.68E-09
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Styrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	8.86E-08	2.86E-08	7.46E-09	0.00E+00	0.00E+00	0.00E+00	2.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.12E-08	1.50E-07

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
1,3-Butadiene	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Acetaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arsenic	2.6%	6.3%	3.1%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	12.5%
Benzene	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Beryllium	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Cadmium	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%
Chrysene	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.6%
Chromium(VI)	48.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	48.1%
Cresols	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ethyl Benzene	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Formaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hydrogen Sulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hexane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Indeno[1,2,3-cd]pyrene	0.9%	12.5%	1.9%	0.0%	0.0%	0.0%	15.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.3%	31.2%
Manganese	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mercury	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Naphthalene	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%
Ammonia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PAHs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phenol	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Propylene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Selenium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Silver	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Styrene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Xylenes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUM	59.1%	19.1%	5.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.8%	100.0%

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

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-7
Post-Project Maxium Exposed Individual Worker

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
1,3-Butadiene	1.21E-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	1.21E-10
Acetaldehyde	7.55E-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	0.00E+00	0.00E+00	0.00E+00	7.55E-12
Arsenic	9.06E-10	4.17E-09	1.76E-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	5.93E-09	6.84E-09
Benzene	1.27E-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	1.27E-10
Beryllium	1.70E-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	1.70E-10
Cadmium	7.44E-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	7.44E-10
Chrysene	2.35E-12	5.39E-11	7.00E-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	6.09E-11	6.32E-11
Chromium(VI)	1.65E-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	1.65E-08
Cresols	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	7.52E-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	0.00E+00	0.00E+00	0.00E+00	7.52E-12
Formaldehyde	9.63E-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	0.00E+00	0.00E+00	0.00E+00	9.63E-14
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno[1,2,3-cd]pyrene	1.17E-10	2.70E-09	3.50E-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	3.05E-09	3.16E-09
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	3.51E-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	0.00E+00	0.00E+00	0.00E+00	3.51E-10
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Styrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	1.91E-08	6.92E-09	2.12E-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	9.04E-09	2.81E-08

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
1,3-Butadiene	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Acetaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Arsenic	3.2%	14.8%	6.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.1%	24.3%
Benzene	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Beryllium	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Cadmium	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%
Chrysene	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%
Chromium(VI)	58.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	58.7%
Cresols	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ethyl Benzene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Formaldehyde	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hydrogen Sulfide	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hexane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Indeno[1,2,3-cd]pyrene	0.4%	9.6%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.9%	11.2%
Manganese	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mercury	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Naphthalene	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%
Ammonia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PAHs	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Phenol	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Propylene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Selenium	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Silver	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Styrene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Toluene	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Xylenes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SUM	68.0%	24.6%	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.2%	100.0%

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

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-8
Post-Project Maxium Chronic Hazard Index

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	RESP
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	1.76E-07	**0.00E+00**	0.00E+00	0.00E+00	1.76E-07	**0.0%**
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	**9.44E-08**	0.00E+00	0.00E+00	9.44E-08	**0.0%**
Arsenic	3.53E-03	3.53E-03	0.00E+00	3.53E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**3.53E-03**	3.53E-03	0.00E+00	3.53E-03	**96.4%**
Benzene	0.00E+00	3.71E-07	0.00E+00	3.71E-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	3.71E-07	3.71E-07	**0.0%**
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.40E-07	5.05E-05	0.00E+00	0.00E+00	**5.05E-05**	0.00E+00	0.00E+00	5.05E-05	**1.4%**
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	6.48E-05	0.00E+00	**4.34E-05**	0.00E+00	0.00E+00	6.48E-05	**1.2%**
Chromium(VI)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**2.84E-06**	0.00E+00	1.34E-07	2.84E-06	**0.1%**
Cresols	0.00E+00	5.26E-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	5.26E-09	**0.0%**
Ethyl Benzene	0.00E+00	0.00E+00	0.00E+00	7.56E-09	7.56E-09	0.00E+00	7.56E-09	0.00E+00	7.56E-09	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	7.56E-09	**0.0%**
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	**8.92E-09**	0.00E+00	0.00E+00	8.92E-09	**0.0%**
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	**1.93E-06**	0.00E+00	0.00E+00	1.93E-06	**0.1%**
Hexane	0.00E+00	9.03E-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	9.03E-09	**0.0%**
Manganese	0.00E+00	6.43E-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	6.43E-05	**0.0%**
Mercury	0.00E+00	2.94E-05	0.00E+00	2.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-05	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	2.94E-05	**0.0%**
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	**5.69E-06**	0.00E+00	0.00E+00	5.69E-06	**0.2%**
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	**2.56E-05**	0.00E+00	0.00E+00	2.56E-05	**0.7%**
Phenol	1.04E-08	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-08	0.00E+00	1.04E-08	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	1.04E-08	**0.0%**
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	**1.17E-09**	0.00E+00	0.00E+00	1.17E-09	**0.0%**
Selenium	1.77E-07	1.77E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-07	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	1.77E-07	**0.0%**
Styrene	0.00E+00	4.38E-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	4.38E-09	**0.0%**
Toluene	0.00E+00	1.33E-07	0.00E+00	1.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	**1.33E-07**	0.00E+00	0.00E+00	1.33E-07	**0.0%**
Xylenes	0.00E+00	9.75E-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	**9.75E-08**	0.00E+00	0.00E+00	9.75E-08	**0.0%**
SUM	3.53E-03	3.62E-03	0.00E+00	3.56E-03	7.56E-09	0.00E+00	1.03E-06	5.05E-05	9.43E-05	1.76E-07	**3.66E-03**	3.53E-03	5.05E-07	3.66E-03	**100.0%**

Attachment D
Phillips 66 - Wilmington Plant
ULSD Project
Table D-9
Post-Project Maxium Acute Hazard Index

CHEM	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX	CNS
Acetaldehyde	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	5.56E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E-07	0.00E+00	0.00E+00	5.56E-07	**0.0%**
Arsenic	1.31E-04	**1.31E-04**	0.00E+00	1.31E-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	1.31E-04	**90.3%**
Benzene	0.00E+00	**0.00E+00**	0.00E+00	2.66E-07	0.00E+00	0.00E+00	0.00E+00	2.66E-07	0.00E+00	2.66E-07	0.00E+00	0.00E+00	2.66E-07	2.66E-07	**0.0%**
Formaldehyde	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	2.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.89E-08	**0.0%**
Hydrogen Sulfide	0.00E+00	**8.97E-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	0.00E+00	0.00E+00	0.00E+00	8.97E-06	**6.2%**
Mercury	0.00E+00	**4.37E-06**	0.00E+00	4.37E-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	0.00E+00	4.37E-06	**3.0%**
Ammonia	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	3.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.17E-05	0.00E+00	0.00E+00	3.17E-05	**0.0%**
Phenol	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	3.51E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.51E-09	0.00E+00	0.00E+00	3.51E-09	**0.0%**
Styrene	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	1.23E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-11	0.00E+00	0.00E+00	1.23E-11	**0.0%**
Toluene	0.00E+00	**1.11E-08**	0.00E+00	1.11E-08	0.00E+00	1.11E-08	0.00E+00	0.00E+00	0.00E+00	1.11E-08	1.11E-08	0.00E+00	0.00E+00	1.11E-08	**0.0%**
Xylenes	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	2.03E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-10	0.00E+00	0.00E+00	2.03E-10	**0.0%**
SUM	1.31E-04	**1.45E-04**	0.00E+00	1.36E-04	0.00E+00	3.23E-05	0.00E+00	2.66E-07	0.00E+00	2.77E-07	3.22E-05	0.00E+00	2.66E-07	1.45E-04	**100.0%**

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ATTACHMENT E

Electronic Files

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```
This file: C:\HARP\PROJECTS\2696CP\2696B201\2696 B201 MEIR.txt

Created by HARP Version 1.4f  Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:35:57 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B201.EMS
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method:   Derived  (Adjusted) Method
Health effect:     Cancer Risk
Receptor(s):       861
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	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0002	7440382	Arsenic	Arsenic	0.000E+00
0003	71432	Benzene	Benzene	0.000E+00
0004	7440417	Beryllium	Beryllium	0.000E+00
0005	7440439	Cadmium	Cadmium	0.000E+00
0006	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0007	50000	Formaldehyde	Formaldehyde	0.000E+00
0008	7783064	H2S	Hydrogen sulfide	0.000E+00
0009	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0010	7439965	Manganese	Manganese	0.000E+00
0011	7439976	Mercury	Mercury	0.000E+00
0012	91203	Naphthalene	Naphthalene	0.000E+00
0013	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	7782492	Selenium	Selenium	0.000E+00
0016	7440224	Silver	Silver	0.000E+00
0017	108883	Toluene	Toluene	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	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0002	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0003	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0004	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0005	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0006	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0007	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0008	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0009	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0010	7439965	Manganese	*	*	9.00E-02	*	*
0011	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0012	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*

0013	1150	PAHs-w/	*	*	*	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	7782492	Selenium	*	*	2.00E+01	*	*
0016	7440224	Silver	*	*	*	*	*
0017	108883	Toluene	*	*	3.00E+02	*	3.70E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B201 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
75070	Acetaldehyde	1	0	1.89E+00	2.15E-04
7440382	Arsenic	1	0	1.89E-01	2.16E-05
71432	Benzene	1	0	2.49E+00	2.85E-04
7440417	Beryllium	1	0	5.06E-02	5.77E-06
7440439	Cadmium	1	0	1.24E-01	1.42E-05
18540299	Cr(VI)	1	0	8.08E-02	9.22E-06
50000	Formaldehyde	1	0	1.15E-02	1.31E-06
7783064	H2S	1	0	2.72E+00	3.11E-04
193395	In[1,2,3-cd]pyr	1	0	1.05E-04	1.20E-08
7439965	Manganese	1	0	8.28E-01	9.45E-05
7439976	Mercury	1	0	1.89E-02	2.16E-06
91203	Naphthalene	1	0	6.13E-02	7.00E-06
1150	PAHs-w/	1	0	7.57E-02	8.64E-06
108952	Phenol	1	0	1.46E-01	1.67E-05
7782492	Selenium	1	0	5.06E-01	5.77E-05
7440224	Silver	1	0	1.01E-01	1.15E-05
108883	Toluene	1	0	2.97E+00	3.39E-04

CANCER RISK REPORT

DOMINANT PATHWAYS, Receptor 861

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	A	-	-	-	-	-	-	-	-	-	-	-
0002	A	YES	-	-	-	-	-	-	-	-	-	-
0003	A	-	-	-	-	-	-	-	-	-	-	-
0004	A	-	-	-	-	-	-	-	-	-	-	-
0005	A	-	-	-	-	-	-	-	-	-	-	-
0006	A	-	-	-	-	-	-	-	-	-	-	-
0007	A	-	-	-	-	-	-	-	-	-	-	-
0008	-	-	-	-	-	-	-	-	-	-	-	-
0009	-	YES	-	-	-	-	YES	-	-	-	-	-
0010	-	-	-	-	-	-	-	-	-	-	-	-
0011	-	-	-	-	-	-	-	-	-	-	-	-
0012	A	-	-	-	-	-	-	-	-	-	-	-
0013	-	-	-	-	-	-	-	-	-	-	-	-
0014	-	-	-	-	-	-	-	-	-	-	-	-
0015	-	-	-	-	-	-	-	-	-	-	-	-
0016	-	-	-	-	-	-	-	-	-	-	-	-
0017	-	-	-	-	-	-	-	-	-	-	-	-

DERIVED CANCER RISK, RECEPTOR 861

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME
0001	2.54E-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	2.54E-11	
0002	3.05E-09	7.31E-09	3.56E-09	0.00E+00	0.00E+00	0.00E+00	6.54E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-08	1.46E-08	

0003	3.35E-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	3.35E-10	
0004	5.72E-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	5.72E-10	
0005	2.50E-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	0.00E+00	2.50E-09	
0006	5.55E-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	0.00E+00	5.55E-08	
0007	3.25E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.25E-13	
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	0.00E+00	
0009	4.95E-14	6.58E-13	9.86E-14	0.00E+00	0.00E+00	0.00E+00	8.35E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-12	1.64E-12		
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	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	0.00E+00	0.00E+00	
0012	9.90E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.90E-12	
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	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	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	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	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	0.00E+00	
SUM	6.20E-08	7.31E-09	3.56E-09	0.00E+00	0.00E+00	0.00E+00	6.54E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-08	7.35E-08	381700	373

This file: C:\HARP\PROJECTS\2696CP\2696B201\2696 B201 MEIW.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:37:14 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B201.EMS
   Site parameters file: C:\HARP\PROJECTS\worker pathway.sit

Coordinate system: UTM NAD83

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):   788
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

*** 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	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0002	7440382	Arsenic	Arsenic	0.000E+00
0003	71432	Benzene	Benzene	0.000E+00
0004	7440417	Beryllium	Beryllium	0.000E+00
0005	7440439	Cadmium	Cadmium	0.000E+00
0006	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0007	50000	Formaldehyde	Formaldehyde	0.000E+00
0008	7783064	H2S	Hydrogen sulfide	0.000E+00
0009	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0010	7439965	Manganese	Manganese	0.000E+00
0011	7439976	Mercury	Mercury	0.000E+00
0012	91203	Naphthalene	Naphthalene	0.000E+00
0013	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	7782492	Selenium	Selenium	0.000E+00
0016	7440224	Silver	Silver	0.000E+00
0017	108883	Toluene	Toluene	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	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0002	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0003	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0004	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0005	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0006	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0007	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0008	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0009	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0010	7439965	Manganese	*	*	9.00E-02	*	*
0011	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0012	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0013	1150	PAHs-w/	*	*	*	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	7782492	Selenium	*	*	2.00E+01	*	*
0016	7440224	Silver	*	*	*	*	*
0017	108883	Toluene	*	*	3.00E+02	*	3.70E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B201 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
75070	Acetaldehyde	1	0	1.89E+00	2.15E-04
7440382	Arsenic	1	0	1.89E-01	2.16E-05
71432	Benzene	1	0	2.49E+00	2.85E-04
7440417	Beryllium	1	0	5.06E-02	5.77E-06
7440439	Cadmium	1	0	1.24E-01	1.42E-05
18540299	Cr(VI)	1	0	8.08E-02	9.22E-06
50000	Formaldehyde	1	0	1.15E-02	1.31E-06
7783064	H2S	1	0	2.72E+00	3.11E-04
193395	In[1,2,3-cd]pyr	1	0	1.05E-04	1.20E-08
7439965	Manganese	1	0	8.28E-01	9.45E-05
7439976	Mercury	1	0	1.89E-02	2.16E-06
91203	Naphthalene	1	0	6.13E-02	7.00E-06
1150	PAHs-w/	1	0	7.57E-02	8.64E-06
108952	Phenol	1	0	1.46E-01	1.67E-05
7782492	Selenium	1	0	5.06E-01	5.77E-05
7440224	Silver	1	0	1.01E-01	1.15E-05
108883	Toluene	1	0	2.97E+00	3.39E-04

CANCER RISK REPORT

AVERAGE CANCER RISK, RECEPTOR 788

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME	
0001	5.87E-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	0.00E+00	0.00E+00	0.00E+00	5.87E-12		
0002	7.04E-10	3.24E-09	1.37E-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	4.61E-09	5.32E-09		
0003	7.73E-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	7.73E-11		
0004	1.32E-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	1.32E-10		
0005	5.78E-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	5.78E-10		
0006	1.28E-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	1.28E-08		
0007	7.50E-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	0.00E+00	0.00E+00	0.00E+00	7.50E-14		
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	1.27E-14	2.92E-13	3.79E-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	3.30E-13	3.43E-13		
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	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	0.00E+00	0.00E+00	0.00E+00	2.28E-12		
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		
SUM	1.43E-08	3.24E-09	1.37E-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	4.61E-09	1.89E-08	382500	373

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This file: C:\HARP\PROJECTS\2696CP\2696B201\2696 B201 MCHI.txt

Created by HARP Version 1.4f  Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:36:19 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B201.EMS
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: resident
Analysis method:   Derived (OEHHA) Method
Health effect:     Chronic HI
Receptor(s):       788
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	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0002	7440382	Arsenic	Arsenic	0.000E+00
0003	71432	Benzene	Benzene	0.000E+00
0004	7440417	Beryllium	Beryllium	0.000E+00
0005	7440439	Cadmium	Cadmium	0.000E+00
0006	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0007	50000	Formaldehyde	Formaldehyde	0.000E+00
0008	7783064	H2S	Hydrogen sulfide	0.000E+00
0009	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0010	7439965	Manganese	Manganese	0.000E+00
0011	7439976	Mercury	Mercury	0.000E+00
0012	91203	Naphthalene	Naphthalene	0.000E+00
0013	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	7782492	Selenium	Selenium	0.000E+00
0016	7440224	Silver	Silver	0.000E+00
0017	108883	Toluene	Toluene	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	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0002	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0003	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0004	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0005	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0006	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0007	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0008	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0009	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0010	7439965	Manganese	*	*	9.00E-02	*	*
0011	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0012	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*

0013	1150	PAHs-w/	*	*	*	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	7782492	Selenium	*	*	2.00E+01	*	*
0016	7440224	Silver	*	*	*	*	*
0017	108883	Toluene	*	*	3.00E+02	*	3.70E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B201 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
75070	Acetaldehyde	1	0	1.89E+00	2.15E-04
7440382	Arsenic	1	0	1.89E-01	2.16E-05
71432	Benzene	1	0	2.49E+00	2.85E-04
7440417	Beryllium	1	0	5.06E-02	5.77E-06
7440439	Cadmium	1	0	1.24E-01	1.42E-05
18540299	Cr(VI)	1	0	8.08E-02	9.22E-06
50000	Formaldehyde	1	0	1.15E-02	1.31E-06
7783064	H2S	1	0	2.72E+00	3.11E-04
193395	In[1,2,3-cd]pyr	1	0	1.05E-04	1.20E-08
7439965	Manganese	1	0	8.28E-01	9.45E-05
7439976	Mercury	1	0	1.89E-02	2.16E-06
91203	Naphthalene	1	0	6.13E-02	7.00E-06
1150	PAHs-w/	1	0	7.57E-02	8.64E-06
108952	Phenol	1	0	1.46E-01	1.67E-05
7782492	Selenium	1	0	5.06E-01	5.77E-05
7440224	Silver	1	0	1.01E-01	1.15E-05
108883	Toluene	1	0	2.97E+00	3.39E-04

CHRONIC HI REPORT

DOMINANT PATHWAYS, Receptor 788

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	YES	-	-	-	-	-	-	-	-	-	-	-
0002	YES	YES	YES	-	-	-	-	-	-	-	-	-
0003	YES	-	-	-	-	-	-	-	-	-	-	-
0004	YES	-	YES	-	-	-	YES	-	-	-	-	-
0005	YES	-	YES	-	-	-	YES	-	-	-	-	-
0006	YES	-	YES	-	-	-	YES	-	-	-	-	-
0007	YES	-	-	-	-	-	-	-	-	-	-	-
0008	YES	-	-	-	-	-	-	-	-	-	-	-
0009	YES	YES	-	-	-	-	YES	-	-	-	-	-
0010	YES	-	-	-	-	-	-	-	-	-	-	-
0011	YES	YES	-	-	-	-	YES	-	-	-	-	-
0012	YES	-	-	-	-	-	-	-	-	-	-	-
0013	-	-	-	-	-	-	-	-	-	-	-	-
0014	YES	-	-	-	-	-	-	-	-	-	-	-
0015	YES	-	-	-	-	-	-	-	-	-	-	-
0016	YES	-	-	-	-	-	-	-	-	-	-	-
0017	YES	-	-	-	-	-	-	-	-	-	-	-

DERIVED CHRONIC HI, RECEPTOR 788

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.34E-08	0.00E+00	0.00E+00	7.34E-08		
0002	2.74E-03	2.74E-03	0.00E+00	2.74E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-03	2.74E-03	0.00E+00	2.74E-03		

0003	0.00E+00	2.26E-07	0.00E+00	2.26E-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	2.26E-07	2.26E-07		
0004	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.53E-07	3.93E-05	0.00E+00	0.00E+00	3.93E-05	0.00E+00	0.00E+00	3.93E-05		
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-05	0.00E+00	3.37E-05	0.00E+00	0.00E+00	5.03E-05		
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	0.00E+00	2.20E-06	0.00E+00	1.04E-07	2.20E-06	
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	6.94E-09	0.00E+00	0.00E+00	6.94E-09	
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	1.48E-06	0.00E+00	0.00E+00	1.48E-06	
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	0.00E+00	
0010	0.00E+00	5.00E-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	0.00E+00	5.00E-05	
0011	0.00E+00	2.28E-05	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-05		
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	3.70E-08	0.00E+00	0.00E+00	3.70E-08	
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	3.97E-09	3.97E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-09	0.00E+00	3.97E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.97E-09		
0015	1.37E-07	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-07		
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	5.38E-08	0.00E+00	5.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.38E-08	0.00E+00	0.00E+00	5.38E-08		
SUM	2.74E-03	2.82E-03	0.00E+00	2.77E-03	0.00E+00	0.00E+00	7.94E-07	3.93E-05	7.31E-05	0.00E+00	2.82E-03	2.74E-03	3.29E-07	2.82E-03	382500	3737400

This file: C:\HARP\PROJECTS\2696CP\2696B201\2696 B201 MAHI.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:35:34 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B201.EMS
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Analysis method: Point Estimate
Health effect: Acute HI Simple (Concurrent Max.)
Receptor(s):   778
Sources(s):   All
Chemicals(s):   All

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0002	7440382	Arsenic	Arsenic	0.000E+00
0003	71432	Benzene	Benzene	0.000E+00
0004	7440417	Beryllium	Beryllium	0.000E+00
0005	7440439	Cadmium	Cadmium	0.000E+00
0006	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0007	50000	Formaldehyde	Formaldehyde	0.000E+00
0008	7783064	H2S	Hydrogen sulfide	0.000E+00
0009	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0010	7439965	Manganese	Manganese	0.000E+00
0011	7439976	Mercury	Mercury	0.000E+00
0012	91203	Naphthalene	Naphthalene	0.000E+00
0013	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0014	108952	Phenol	Phenol	0.000E+00
0015	7782492	Selenium	Selenium	0.000E+00
0016	7440224	Silver	Silver	0.000E+00
0017	108883	Toluene	Toluene	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	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0002	7440382	Arsenic	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0003	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0004	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0005	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*

0006	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0007	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0008	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0009	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0010	7439965	Manganese	*	*	9.00E-02	*	*
0011	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0012	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0013	1150	PAHs-w/	*	*	*	*	*
0014	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0015	7782492	Selenium	*	*	2.00E+01	*	*
0016	7440224	Silver	*	*	*	*	*
0017	108883	Toluene	*	*	3.00E+02	*	3.70E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B201\2696B201.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B201 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
75070	Acetaldehyde	1	0	1.89E+00	2.15E-04
7440382	Arsenic	1	0	1.89E-01	2.16E-05
71432	Benzene	1	0	2.49E+00	2.85E-04
7440417	Beryllium	1	0	5.06E-02	5.77E-06
7440439	Cadmium	1	0	1.24E-01	1.42E-05
18540299	Cr(VI)	1	0	8.08E-02	9.22E-06
50000	Formaldehyde	1	0	1.15E-02	1.31E-06
7783064	H2S	1	0	2.72E+00	3.11E-04
193395	In[1,2,3-cd]pyr	1	0	1.05E-04	1.20E-08
7439965	Manganese	1	0	8.28E-01	9.45E-05
7439976	Mercury	1	0	1.89E-02	2.16E-06
91203	Naphthalene	1	0	6.13E-02	7.00E-06
1150	PAHs-w/	1	0	7.57E-02	8.64E-06
108952	Phenol	1	0	1.46E-01	1.67E-05
7782492	Selenium	1	0	5.06E-01	5.77E-05
7440224	Silver	1	0	1.01E-01	1.15E-05
108883	Toluene	1	0	2.97E+00	3.39E-04

ACUTE HI REPORT

ACUTE HI, RECEPTOR 778

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	4.75E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.75E-07	0.00E+00	0.00E+00	4.75E-07		
0002	1.12E-04	1.12E-04	0.00E+00	1.12E-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	1.12E-04		
0003	0.00E+00	0.00E+00	0.00E+00	2.28E-07	0.00E+00	0.00E+00	0.00E+00	2.28E-07	0.00E+00	2.28E-07	0.00E+00	0.00E+00	2.28E-07	2.28E-07		
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.48E-08		
0008	0.00E+00	7.70E-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	0.00E+00	0.00E+00	0.00E+00	7.70E-06		
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	3.74E-06	0.00E+00	3.74E-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	0.00E+00	3.74E-06		
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		
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	2.99E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.99E-09	0.00E+00	0.00E+00	2.99E-09		
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	9.52E-09	0.00E+00	9.52E-09	0.00E+00	9.52E-09	0.00E+00	0.00E+00	0.00E+00	9.52E-09	9.52E-09	0.00E+00	0.00E+00	9.52E-09	
SUM	1.12E-04	1.24E-04	0.00E+00	1.16E-04	0.00E+00	5.13E-07	0.00E+00	2.28E-07	0.00E+00	2.37E-07	4.88E-07	0.00E+00	2.28E-07	1.24E-04	381500	3737400

This file: C:\HARP\PROJECTS\2696CP\2696B401\2696 B401 MEIR.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:47:23 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B401.EMS
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method: Derived (Adjusted) Method
Health effect: Cancer Risk
Receptor(s):   861
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	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0002	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0003	1016	As cmpd(inorg)	Arsenic compounds (inorganic)	0.000E+00
0004	71432	Benzene	Benzene	0.000E+00
0005	7440417	Beryllium	Beryllium	0.000E+00
0006	7440439	Cadmium	Cadmium	0.000E+00
0007	218019	Chrysene	Chrysene	0.000E+00
0008	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0009	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0010	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0011	50000	Formaldehyde	Formaldehyde	0.000E+00
0012	7783064	H2S	Hydrogen sulfide	0.000E+00
0013	110543	Hexane	Hexane	0.000E+00
0014	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0015	7439965	Manganese	Manganese	0.000E+00
0016	7439976	Mercury	Mercury	0.000E+00
0017	91203	Naphthalene	Naphthalene	0.000E+00
0018	7664417	NH3	Ammonia	0.000E+00
0019	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0020	108952	Phenol	Phenol	0.000E+00
0021	115071	Propylene	Propylene	0.000E+00
0022	7782492	Selenium	Selenium	0.000E+00
0023	7440224	Silver	Silver	0.000E+00
0024	100425	Styrene	Styrene	0.000E+00
0025	108883	Toluene	Toluene	0.000E+00
0026	1330207	Xylenes	Xylenes (mixed)	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	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0002	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0003	1016	As cmpd(inorg)	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01

0004	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0005	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0006	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0007	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0008	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0009	1319773	Cresols	*	*	6.00E+02	*	*
0010	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0011	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0012	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0013	110543	Hexane	*	*	7.00E+03	*	*
0014	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0015	7439965	Manganese	*	*	9.00E-02	*	*
0016	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0017	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0018	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0019	1150	PAHs-w/	*	*	*	*	*
0020	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0021	115071	Propylene	*	*	3.00E+03	*	*
0022	7782492	Selenium	*	*	2.00E+01	*	*
0023	7440224	Silver	*	*	*	*	*
0024	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0025	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0026	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B401 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	0.00E+00	0.00E+00
75070	Acetaldehyde	1	0	2.42E+00	2.76E-04
1016	As cmpd(inorg)	1	0	2.42E-01	2.77E-05
71432	Benzene	1	0	3.20E+00	3.65E-04
7440417	Beryllium	1	0	6.48E-02	7.40E-06
7440439	Cadmium	1	0	1.59E-01	1.81E-05
218019	Chrysene	1	0	0.00E+00	0.00E+00
18540299	Cr(VI)	1	0	1.04E-01	1.18E-05
1319773	Cresols	1	0	0.00E+00	0.00E+00
100414	Ethyl Benzene	1	0	0.00E+00	0.00E+00
50000	Formaldehyde	1	0	1.47E-02	1.68E-06
7783064	H2S	1	0	3.49E+00	3.98E-04
110543	Hexane	1	0	0.00E+00	0.00E+00
193395	In[1,2,3-cd]pyr	1	0	1.35E-04	1.54E-08
7439965	Manganese	1	0	1.06E+00	1.21E-04
7439976	Mercury	1	0	2.43E-02	2.77E-06
91203	Naphthalene	1	0	7.86E-02	8.97E-06
7664417	NH3	1	0	9.38E+02	1.07E-01
1150	PAHs-w/	1	0	9.70E-02	1.11E-05
108952	Phenol	1	0	1.88E-01	2.14E-05
115071	Propylene	1	0	0.00E+00	0.00E+00
7782492	Selenium	1	0	6.48E-01	7.40E-05
7440224	Silver	1	0	1.30E-01	1.48E-05
100425	Styrene	1	0	0.00E+00	0.00E+00
108883	Toluene	1	0	3.80E+00	4.34E-04
1330207	Xylenes	1	0	0.00E+00	0.00E+00

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=2 NAME=U90FUG EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	2.23E-01	6.96E-08
75070	Acetaldehyde	1	0	0.00E+00	0.00E+00
1016	As cmpd(inorg)	1	0	0.00E+00	0.00E+00
71432	Benzene	1	0	3.02E-01	9.45E-08
7440417	Beryllium	1	0	0.00E+00	0.00E+00
7440439	Cadmium	1	0	0.00E+00	0.00E+00
218019	Chrysene	1	0	6.68E-02	2.09E-08
18540299	Cr(VI)	1	0	0.00E+00	0.00E+00
1319773	Cresols	1	0	2.00E-01	6.26E-08
100414	Ethyl Benzene	1	0	9.59E-01	3.00E-07
50000	Formaldehyde	1	0	0.00E+00	0.00E+00
7783064	H2S	1	0	1.48E-02	4.64E-09
110543	Hexane	1	0	4.01E+00	1.25E-06
193395	In[1,2,3-cd]pyr	1	0	3.34E-01	1.04E-07
7439965	Manganese	1	0	0.00E+00	0.00E+00
7439976	Mercury	1	0	0.00E+00	0.00E+00
91203	Naphthalene	1	0	3.22E+00	1.01E-06
7664417	NH3	1	0	0.00E+00	0.00E+00
1150	PAHs-w/	1	0	0.00E+00	0.00E+00
108952	Phenol	1	0	6.68E-02	2.09E-08
115071	Propylene	1	0	2.23E-01	6.96E-08
7782492	Selenium	1	0	0.00E+00	0.00E+00
7440224	Silver	1	0	0.00E+00	0.00E+00
100425	Styrene	1	0	2.50E-01	7.83E-08
108883	Toluene	1	0	1.21E+00	3.79E-07
1330207	Xylenes	1	0	4.33E+00	1.35E-06

CANCER RISK REPORT

DOMINANT PATHWAYS, Receptor 861

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	A	-	-	-	-	-	-	-	-	-	-	-
0002	A	-	-	-	-	-	-	-	-	-	-	-
0003	A	YES	-	-	-	-	-	-	-	-	-	-
0004	A	-	-	-	-	-	-	-	-	-	-	-
0005	A	-	-	-	-	-	-	-	-	-	-	-
0006	A	-	-	-	-	-	-	-	-	-	-	-
0007	-	YES	-	-	-	-	YES	-	-	-	-	-
0008	A	-	-	-	-	-	-	-	-	-	-	-
0009	-	-	-	-	-	-	-	-	-	-	-	-
0010	A	-	-	-	-	-	-	-	-	-	-	-
0011	A	-	-	-	-	-	-	-	-	-	-	-
0012	-	-	-	-	-	-	-	-	-	-	-	-
0013	-	-	-	-	-	-	-	-	-	-	-	-
0014	-	YES	-	-	-	-	YES	-	-	-	-	-
0015	-	-	-	-	-	-	-	-	-	-	-	-
0016	-	-	-	-	-	-	-	-	-	-	-	-
0017	A	-	-	-	-	-	-	-	-	-	-	-
0018	-	-	-	-	-	-	-	-	-	-	-	-
0019	-	-	-	-	-	-	-	-	-	-	-	-
0020	-	-	-	-	-	-	-	-	-	-	-	-
0021	-	-	-	-	-	-	-	-	-	-	-	-

0022	-	-	-	-	-	-	-	-	-	-	-	-					
0023	-	-	-	-	-	-	-	-	-	-	-	-					
0024	-	-	-	-	-	-	-	-	-	-	-	-					
0025	-	-	-	-	-	-	-	-	-	-	-	-					
0026	-	-	-	-	-	-	-	-	-	-	-	-					

DERIVED CANCER RISK, RECEPTOR 861

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME	
0001	1.62E-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	1.62E-09		
0002	3.29E-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	3.29E-11		
0003	3.95E-09	9.44E-09	4.60E-09	0.00E+00	0.00E+00	0.00E+00	8.44E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-08	1.88E-08		
0004	7.99E-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	7.99E-10		
0005	7.39E-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	7.39E-10		
0006	3.24E-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	3.24E-09		
0007	2.82E-11	3.75E-10	5.62E-11	0.00E+00	0.00E+00	0.00E+00	4.76E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.08E-10	9.36E-10		
0008	7.21E-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	7.21E-08		
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	0.00E+00		
0010	1.01E-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	1.01E-10		
0011	4.19E-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	0.00E+00	0.00E+00	0.00E+00	4.19E-13		
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	1.41E-09	1.88E-08	2.81E-09	0.00E+00	0.00E+00	0.00E+00	2.38E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.54E-08	4.68E-08		
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	4.68E-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	4.68E-09		
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	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	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	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	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	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	0.00E+00		
SUM	8.86E-08	2.86E-08	7.46E-09	0.00E+00	0.00E+00	0.00E+00	2.51E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.12E-08	1.50E-07	381700	373

This file: C:\HARP\PROJECTS\2696CP\2696B401\2696 B401 MEIW.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:48:30 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B401.EMS
   Site parameters file: C:\HARP\PROJECTS\worker pathway.sit

Coordinate system: UTM NAD83

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):   788
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

*** 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	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0002	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0003	1016	As cmpd(inorg)	Arsenic compounds (inorganic)	0.000E+00
0004	71432	Benzene	Benzene	0.000E+00
0005	7440417	Beryllium	Beryllium	0.000E+00
0006	7440439	Cadmium	Cadmium	0.000E+00
0007	218019	Chrysene	Chrysene	0.000E+00
0008	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0009	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0010	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0011	50000	Formaldehyde	Formaldehyde	0.000E+00
0012	7783064	H2S	Hydrogen sulfide	0.000E+00
0013	110543	Hexane	Hexane	0.000E+00
0014	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0015	7439965	Manganese	Manganese	0.000E+00
0016	7439976	Mercury	Mercury	0.000E+00
0017	91203	Naphthalene	Naphthalene	0.000E+00
0018	7664417	NH3	Ammonia	0.000E+00
0019	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0020	108952	Phenol	Phenol	0.000E+00
0021	115071	Propylene	Propylene	0.000E+00
0022	7782492	Selenium	Selenium	0.000E+00
0023	7440224	Silver	Silver	0.000E+00
0024	100425	Styrene	Styrene	0.000E+00
0025	108883	Toluene	Toluene	0.000E+00
0026	1330207	Xylenes	Xylenes (mixed)	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	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0002	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0003	1016	As cmpd(inorg)	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0004	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0005	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0006	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0007	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0008	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0009	1319773	Cresols	*	*	6.00E+02	*	*
0010	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0011	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01

0012	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0013	110543	Hexane	*	*	7.00E+03	*	*
0014	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0015	7439965	Manganese	*	*	9.00E-02	*	*
0016	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0017	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0018	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0019	1150	PAHs-w/	*	*	*	*	*
0020	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0021	115071	Propylene	*	*	3.00E+03	*	*
0022	7782492	Selenium	*	*	2.00E+01	*	*
0023	7440224	Silver	*	*	*	*	*
0024	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0025	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0026	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B401 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	0.00E+00	0.00E+00
75070	Acetaldehyde	1	0	2.42E+00	2.76E-04
1016	As cmpd(inorg)	1	0	2.42E-01	2.77E-05
71432	Benzene	1	0	3.20E+00	3.65E-04
7440417	Beryllium	1	0	6.48E-02	7.40E-06
7440439	Cadmium	1	0	1.59E-01	1.81E-05
218019	Chrysene	1	0	0.00E+00	0.00E+00
18540299	Cr(VI)	1	0	1.04E-01	1.18E-05
1319773	Cresols	1	0	0.00E+00	0.00E+00
100414	Ethyl Benzene	1	0	0.00E+00	0.00E+00
50000	Formaldehyde	1	0	1.47E-02	1.68E-06
7783064	H2S	1	0	3.49E+00	3.98E-04
110543	Hexane	1	0	0.00E+00	0.00E+00
193395	In[1,2,3-cd]pyr	1	0	1.35E-04	1.54E-08
7439965	Manganese	1	0	1.06E+00	1.21E-04
7439976	Mercury	1	0	2.43E-02	2.77E-06
91203	Naphthalene	1	0	7.86E-02	8.97E-06
7664417	NH3	1	0	9.38E+02	1.07E-01
1150	PAHs-w/	1	0	9.70E-02	1.11E-05
108952	Phenol	1	0	1.88E-01	2.14E-05
115071	Propylene	1	0	0.00E+00	0.00E+00
7782492	Selenium	1	0	6.48E-01	7.40E-05
7440224	Silver	1	0	1.30E-01	1.48E-05
100425	Styrene	1	0	0.00E+00	0.00E+00
108883	Toluene	1	0	3.80E+00	4.34E-04
1330207	Xylenes	1	0	0.00E+00	0.00E+00

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=2 NAME=U90FUG EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	2.23E-01	6.96E-08
75070	Acetaldehyde	1	0	0.00E+00	0.00E+00
1016	As cmpd(inorg)	1	0	0.00E+00	0.00E+00
71432	Benzene	1	0	3.02E-01	9.45E-08

7440417	Beryllium	1	0	0.00E+00	0.00E+00
7440439	Cadmium	1	0	0.00E+00	0.00E+00
218019	Chrysene	1	0	6.68E-02	2.09E-08
18540299	Cr(VI)	1	0	0.00E+00	0.00E+00
1319773	Cresols	1	0	2.00E-01	6.26E-08
100414	Ethyl Benzene	1	0	9.59E-01	3.00E-07
50000	Formaldehyde	1	0	0.00E+00	0.00E+00
7783064	H2S	1	0	1.48E-02	4.64E-09
110543	Hexane	1	0	4.01E+00	1.25E-06
193395	In[1,2,3-cd]pyr	1	0	3.34E-01	1.04E-07
7439965	Manganese	1	0	0.00E+00	0.00E+00
7439976	Mercury	1	0	0.00E+00	0.00E+00
91203	Naphthalene	1	0	3.22E+00	1.01E-06
7664417	NH3	1	0	0.00E+00	0.00E+00
1150	PAHs-w/	1	0	0.00E+00	0.00E+00
108952	Phenol	1	0	6.68E-02	2.09E-08
115071	Propylene	1	0	2.23E-01	6.96E-08
7782492	Selenium	1	0	0.00E+00	0.00E+00
7440224	Silver	1	0	0.00E+00	0.00E+00
100425	Styrene	1	0	2.50E-01	7.83E-08
108883	Toluene	1	0	1.21E+00	3.79E-07
1330207	Xylenes	1	0	4.33E+00	1.35E-06

CANCER RISK REPORT

AVERAGE CANCER RISK, RECEPTOR 788

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME	
0001	1.21E-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	1.21E-10		
0002	7.55E-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	0.00E+00	0.00E+00	0.00E+00	7.55E-12		
0003	9.06E-10	4.17E-09	1.76E-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	5.93E-09	6.84E-09		
0004	1.27E-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	1.27E-10		
0005	1.70E-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	1.70E-10		
0006	7.44E-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	7.44E-10		
0007	2.35E-12	5.39E-11	7.00E-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	6.09E-11	6.32E-11		
0008	1.65E-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	1.65E-08		
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	0.00E+00		
0010	7.52E-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	0.00E+00	0.00E+00	0.00E+00	7.52E-12		
0011	9.63E-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	0.00E+00	0.00E+00	0.00E+00	9.63E-14		
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	1.17E-10	2.70E-09	3.50E-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	3.05E-09	3.16E-09		
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	3.51E-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	0.00E+00	0.00E+00	0.00E+00	3.51E-10		
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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	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	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	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	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	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	0.00E+00		
SUM	1.91E-08	6.92E-09	2.12E-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	9.04E-09	2.81E-08	382500	373

```
This file: C:\HARP\PROJECTS\2696CP\2696B401\2696 B401 MCHI.txt

Created by HARP Version 1.4f  Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:47:36 PM


EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B401.EMS
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: resident
Analysis method:   Derived (OEHHA) Method
Health effect:     Chronic HI
Receptor(s):       788
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	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0002	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0003	1016	As cmpd(inorg)	Arsenic compounds (inorganic)	0.000E+00
0004	71432	Benzene	Benzene	0.000E+00
0005	7440417	Beryllium	Beryllium	0.000E+00
0006	7440439	Cadmium	Cadmium	0.000E+00
0007	218019	Chrysene	Chrysene	0.000E+00
0008	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0009	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0010	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0011	50000	Formaldehyde	Formaldehyde	0.000E+00
0012	7783064	H2S	Hydrogen sulfide	0.000E+00
0013	110543	Hexane	Hexane	0.000E+00
0014	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0015	7439965	Manganese	Manganese	0.000E+00
0016	7439976	Mercury	Mercury	0.000E+00
0017	91203	Naphthalene	Naphthalene	0.000E+00
0018	7664417	NH3	Ammonia	0.000E+00
0019	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0020	108952	Phenol	Phenol	0.000E+00
0021	115071	Propylene	Propylene	0.000E+00
0022	7782492	Selenium	Selenium	0.000E+00
0023	7440224	Silver	Silver	0.000E+00
0024	100425	Styrene	Styrene	0.000E+00
0025	108883	Toluene	Toluene	0.000E+00
0026	1330207	Xylenes	Xylenes (mixed)	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	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0002	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0003	1016	As cmpd(inorg)	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01

0004	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0005	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0006	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0007	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0008	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0009	1319773	Cresols	*	*	6.00E+02	*	*
0010	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0011	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0012	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0013	110543	Hexane	*	*	7.00E+03	*	*
0014	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0015	7439965	Manganese	*	*	9.00E-02	*	*
0016	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0017	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0018	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0019	1150	PAHs-w/	*	*	*	*	*
0020	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0021	115071	Propylene	*	*	3.00E+03	*	*
0022	7782492	Selenium	*	*	2.00E+01	*	*
0023	7440224	Silver	*	*	*	*	*
0024	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0025	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0026	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B401 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	0.00E+00	0.00E+00
75070	Acetaldehyde	1	0	2.42E+00	2.76E-04
1016	As cmpd(inorg)	1	0	2.42E-01	2.77E-05
71432	Benzene	1	0	3.20E+00	3.65E-04
7440417	Beryllium	1	0	6.48E-02	7.40E-06
7440439	Cadmium	1	0	1.59E-01	1.81E-05
218019	Chrysene	1	0	0.00E+00	0.00E+00
18540299	Cr(VI)	1	0	1.04E-01	1.18E-05
1319773	Cresols	1	0	0.00E+00	0.00E+00
100414	Ethyl Benzene	1	0	0.00E+00	0.00E+00
50000	Formaldehyde	1	0	1.47E-02	1.68E-06
7783064	H2S	1	0	3.49E+00	3.98E-04
110543	Hexane	1	0	0.00E+00	0.00E+00
193395	In[1,2,3-cd]pyr	1	0	1.35E-04	1.54E-08
7439965	Manganese	1	0	1.06E+00	1.21E-04
7439976	Mercury	1	0	2.43E-02	2.77E-06
91203	Naphthalene	1	0	7.86E-02	8.97E-06
7664417	NH3	1	0	9.38E+02	1.07E-01
1150	PAHs-w/	1	0	9.70E-02	1.11E-05
108952	Phenol	1	0	1.88E-01	2.14E-05
115071	Propylene	1	0	0.00E+00	0.00E+00
7782492	Selenium	1	0	6.48E-01	7.40E-05
7440224	Silver	1	0	1.30E-01	1.48E-05
100425	Styrene	1	0	0.00E+00	0.00E+00
108883	Toluene	1	0	3.80E+00	4.34E-04
1330207	Xylenes	1	0	0.00E+00	0.00E+00

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=2 NAME=U90FUG EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	2.23E-01	6.96E-08
75070	Acetaldehyde	1	0	0.00E+00	0.00E+00
1016	As cmpd(inorg)	1	0	0.00E+00	0.00E+00
71432	Benzene	1	0	3.02E-01	9.45E-08
7440417	Beryllium	1	0	0.00E+00	0.00E+00
7440439	Cadmium	1	0	0.00E+00	0.00E+00
218019	Chrysene	1	0	6.68E-02	2.09E-08
18540299	Cr(VI)	1	0	0.00E+00	0.00E+00
1319773	Cresols	1	0	2.00E-01	6.26E-08
100414	Ethyl Benzene	1	0	9.59E-01	3.00E-07
50000	Formaldehyde	1	0	0.00E+00	0.00E+00
7783064	H2S	1	0	1.48E-02	4.64E-09
110543	Hexane	1	0	4.01E+00	1.25E-06
193395	In[1,2,3-cd]pyr	1	0	3.34E-01	1.04E-07
7439965	Manganese	1	0	0.00E+00	0.00E+00
7439976	Mercury	1	0	0.00E+00	0.00E+00
91203	Naphthalene	1	0	3.22E+00	1.01E-06
7664417	NH3	1	0	0.00E+00	0.00E+00
1150	PAHs-w/	1	0	0.00E+00	0.00E+00
108952	Phenol	1	0	6.68E-02	2.09E-08
115071	Propylene	1	0	2.23E-01	6.96E-08
7782492	Selenium	1	0	0.00E+00	0.00E+00
7440224	Silver	1	0	0.00E+00	0.00E+00
100425	Styrene	1	0	2.50E-01	7.83E-08
108883	Toluene	1	0	1.21E+00	3.79E-07
1330207	Xylenes	1	0	4.33E+00	1.35E-06

CHRONIC HI REPORT

DOMINANT PATHWAYS, Receptor 788

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	YES	-	-	-	-	-	-	-	-	-	-	-
0002	YES	-	-	-	-	-	-	-	-	-	-	-
0003	YES	YES	YES	-	-	-	-	-	-	-	-	-
0004	YES	-	-	-	-	-	-	-	-	-	-	-
0005	YES	-	YES	-	-	-	YES	-	-	-	-	-
0006	YES	-	YES	-	-	-	YES	-	-	-	-	-
0007	YES	YES	-	-	-	-	YES	-	-	-	-	-
0008	YES	-	YES	-	-	-	YES	-	-	-	-	-
0009	YES	-	-	-	-	-	-	-	-	-	-	-
0010	YES	-	-	-	-	-	-	-	-	-	-	-
0011	YES	-	-	-	-	-	-	-	-	-	-	-
0012	YES	-	-	-	-	-	-	-	-	-	-	-
0013	YES	-	-	-	-	-	-	-	-	-	-	-
0014	YES	YES	-	-	-	-	YES	-	-	-	-	-
0015	YES	-	-	-	-	-	-	-	-	-	-	-
0016	YES	YES	-	-	-	-	YES	-	-	-	-	-
0017	YES	-	-	-	-	-	-	-	-	-	-	-
0018	YES	-	-	-	-	-	-	-	-	-	-	-
0019	-	-	-	-	-	-	-	-	-	-	-	-
0020	YES	-	-	-	-	-	-	-	-	-	-	-
0021	YES	-	-	-	-	-	-	-	-	-	-	-

0022	YES	-	-	-	-	-	-	-	-	-	-	-					
0023	YES	-	-	-	-	-	-	-	-	-	-	-					
0024	YES	-	-	-	-	-	-	-	-	-	-	-					
0025	YES	-	-	-	-	-	-	-	-	-	-	-					
0026	YES	-	-	-	-	-	-	-	-	-	-	-					

DERIVED CHRONIC HI, RECEPTOR 788

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-07	0.00E+00	0.00E+00	0.00E+00	1.76E-07		
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	9.44E-08	0.00E+00	0.00E+00	9.44E-08		
0003	3.53E-03	3.53E-03	0.00E+00	3.53E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-03	3.53E-03	0.00E+00	3.53E-03		
0004	0.00E+00	3.71E-07	0.00E+00	3.71E-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	3.71E-07	3.71E-07		
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.40E-07	5.05E-05	0.00E+00	0.00E+00	5.05E-05	0.00E+00	0.00E+00	5.05E-05		
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	6.48E-05	0.00E+00	4.34E-05	0.00E+00	0.00E+00	6.48E-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	2.84E-06	0.00E+00	1.34E-07	2.84E-06		
0009	0.00E+00	5.26E-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	5.26E-09		
0010	0.00E+00	0.00E+00	0.00E+00	7.56E-09	7.56E-09	0.00E+00	7.56E-09	0.00E+00	7.56E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.56E-09		
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	8.92E-09	0.00E+00	0.00E+00	8.92E-09		
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	1.93E-06	0.00E+00	0.00E+00	1.93E-06		
0013	0.00E+00	9.03E-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	9.03E-09		
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		
0015	0.00E+00	6.43E-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	6.43E-05		
0016	0.00E+00	2.94E-05	0.00E+00	2.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-05		
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	5.69E-06	0.00E+00	0.00E+00	5.69E-06		
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	2.56E-05	0.00E+00	0.00E+00	2.56E-05		
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	1.04E-08	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-08	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E-08		
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	1.17E-09	0.00E+00	0.00E+00	1.17E-09		
0022	1.77E-07	1.77E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-07		
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	4.38E-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	4.38E-09		
0025	0.00E+00	1.33E-07	0.00E+00	1.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-07	0.00E+00	0.00E+00	1.33E-07		
0026	0.00E+00	9.75E-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	9.75E-08	0.00E+00	0.00E+00	9.75E-08		
SUM	3.53E-03	3.62E-03	0.00E+00	3.56E-03	7.56E-09	0.00E+00	1.03E-06	5.05E-05	9.43E-05	1.76E-07	3.66E-03	3.53E-03	5.05E-07	3.66E-03	382500	3737400

This file: C:\HARP\PROJECTS\2696CP\2696B401\2696 B401 MAHI.txt

Created by HARP Version 1.4f Build 23.11.01
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 1/4/2013 5:46:59 PM

EXCEPTION REPORT
   (there have been no changes or exceptions)

INPUT FILES:
   Source-Receptor file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.SRC
   Averaging period adjustment factors file: not applicable
   Emission rates file: 2696B401.EMS
   Site parameters file: C:\HARP\PROJECTS\resident pathway.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Analysis method: Point Estimate
Health effect: Acute HI Simple (Concurrent Max.)
Receptor(s):   1933
Sources(s):   All
Chemicals(s):   All

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0002	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0003	1016	As cmpd(inorg)	Arsenic compounds (inorganic)	0.000E+00
0004	71432	Benzene	Benzene	0.000E+00
0005	7440417	Beryllium	Beryllium	0.000E+00
0006	7440439	Cadmium	Cadmium	0.000E+00
0007	218019	Chrysene	Chrysene	0.000E+00
0008	18540299	Cr(VI)	Chromium, hexavalent (& compounds)	0.000E+00
0009	1319773	Cresols	Cresols (mixtures of) {Cresylic acid}	0.000E+00
0010	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0011	50000	Formaldehyde	Formaldehyde	0.000E+00
0012	7783064	H2S	Hydrogen sulfide	0.000E+00
0013	110543	Hexane	Hexane	0.000E+00
0014	193395	In[1,2,3-cd]pyr	Indeno[1,2,3-cd]pyrene	0.000E+00
0015	7439965	Manganese	Manganese	0.000E+00
0016	7439976	Mercury	Mercury	0.000E+00
0017	91203	Naphthalene	Naphthalene	0.000E+00
0018	7664417	NH3	Ammonia	0.000E+00
0019	1150	PAHs-w/	PAHs, total, with individ. components also reported	0.000E+00
0020	108952	Phenol	Phenol	0.000E+00
0021	115071	Propylene	Propylene	0.000E+00
0022	7782492	Selenium	Selenium	0.000E+00
0023	7440224	Silver	Silver	0.000E+00
0024	100425	Styrene	Styrene	0.000E+00
0025	108883	Toluene	Toluene	0.000E+00
0026	1330207	Xylenes	Xylenes (mixed)	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	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0002	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0003	1016	As cmpd(inorg)	1.20E+01	1.50E+00	1.50E-02	3.50E-06	2.00E-01
0004	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0005	7440417	Beryllium	8.40E+00	*	7.00E-03	2.00E-03	*
0006	7440439	Cadmium	1.50E+01	*	2.00E-02	5.00E-04	*
0007	218019	Chrysene	3.90E-02	1.20E-01	*	*	*
0008	18540299	Cr(VI)	5.10E+02	*	2.00E-01	2.00E-02	*
0009	1319773	Cresols	*	*	6.00E+02	*	*
0010	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0011	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0012	7783064	H2S	*	*	1.00E+01	*	4.20E+01
0013	110543	Hexane	*	*	7.00E+03	*	*
0014	193395	In[1,2,3-cd]pyr	3.90E-01	1.20E+00	*	*	*
0015	7439965	Manganese	*	*	9.00E-02	*	*
0016	7439976	Mercury	*	*	3.00E-02	1.60E-04	6.00E-01
0017	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0018	7664417	NH3	*	*	2.00E+02	*	3.20E+03
0019	1150	PAHs-w/	*	*	*	*	*
0020	108952	Phenol	*	*	2.00E+02	*	5.80E+03
0021	115071	Propylene	*	*	3.00E+03	*	*
0022	7782492	Selenium	*	*	2.00E+01	*	*
0023	7440224	Silver	*	*	*	*	*
0024	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0025	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0026	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\HARP\PROJECTS\2696CP\2696B401\2696B401.EMS
CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=U90B401 EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	0.00E+00	0.00E+00
75070	Acetaldehyde	1	0	2.42E+00	2.76E-04
1016	As cmpd(inorg)	1	0	2.42E-01	2.77E-05
71432	Benzene	1	0	3.20E+00	3.65E-04
7440417	Beryllium	1	0	6.48E-02	7.40E-06
7440439	Cadmium	1	0	1.59E-01	1.81E-05
218019	Chrysene	1	0	0.00E+00	0.00E+00
18540299	Cr(VI)	1	0	1.04E-01	1.18E-05
1319773	Cresols	1	0	0.00E+00	0.00E+00
100414	Ethyl Benzene	1	0	0.00E+00	0.00E+00
50000	Formaldehyde	1	0	1.47E-02	1.68E-06
7783064	H2S	1	0	3.49E+00	3.98E-04
110543	Hexane	1	0	0.00E+00	0.00E+00
193395	In[1,2,3-cd]pyr	1	0	1.35E-04	1.54E-08
7439965	Manganese	1	0	1.06E+00	1.21E-04
7439976	Mercury	1	0	2.43E-02	2.77E-06
91203	Naphthalene	1	0	7.86E-02	8.97E-06
7664417	NH3	1	0	9.38E+02	1.07E-01
1150	PAHs-w/	1	0	9.70E-02	1.11E-05

108952	Phenol	1	0	1.88E-01	2.14E-05
115071	Propylene	1	0	0.00E+00	0.00E+00
7782492	Selenium	1	0	6.48E-01	7.40E-05
7440224	Silver	1	0	1.30E-01	1.48E-05
100425	Styrene	1	0	0.00E+00	0.00E+00
108883	Toluene	1	0	3.80E+00	4.34E-04
1330207	Xylenes	1	0	0.00E+00	0.00E+00

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=2 NAME=U90FUG EMS (lbs/yr)
SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
106990	1,3-Butadiene	1	0	2.23E-01	6.96E-08
75070	Acetaldehyde	1	0	0.00E+00	0.00E+00
1016	As cmpd(inorg)	1	0	0.00E+00	0.00E+00
71432	Benzene	1	0	3.02E-01	9.45E-08
7440417	Beryllium	1	0	0.00E+00	0.00E+00
7440439	Cadmium	1	0	0.00E+00	0.00E+00
218019	Chrysene	1	0	6.68E-02	2.09E-08
18540299	Cr(VI)	1	0	0.00E+00	0.00E+00
1319773	Cresols	1	0	2.00E-01	6.26E-08
100414	Ethyl Benzene	1	0	9.59E-01	3.00E-07
50000	Formaldehyde	1	0	0.00E+00	0.00E+00
7783064	H2S	1	0	1.48E-02	4.64E-09
110543	Hexane	1	0	4.01E+00	1.25E-06
193395	In[1,2,3-cd]pyr	1	0	3.34E-01	1.04E-07
7439965	Manganese	1	0	0.00E+00	0.00E+00
7439976	Mercury	1	0	0.00E+00	0.00E+00
91203	Naphthalene	1	0	3.22E+00	1.01E-06
7664417	NH3	1	0	0.00E+00	0.00E+00
1150	PAHs-w/	1	0	0.00E+00	0.00E+00
108952	Phenol	1	0	6.68E-02	2.09E-08
115071	Propylene	1	0	2.23E-01	6.96E-08
7782492	Selenium	1	0	0.00E+00	0.00E+00
7440224	Silver	1	0	0.00E+00	0.00E+00
100425	Styrene	1	0	2.50E-01	7.83E-08
108883	Toluene	1	0	1.21E+00	3.79E-07
1330207	Xylenes	1	0	4.33E+00	1.35E-06

ACUTE HI REPORT

ACUTE HI, RECEPTOR 1933

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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
0002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.56E-07	0.00E+00	0.00E+00	5.56E-07		
0003	1.31E-04	1.31E-04	0.00E+00	1.31E-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	1.31E-04		
0004	0.00E+00	0.00E+00	0.00E+00	2.66E-07	0.00E+00	0.00E+00	0.00E+00	2.66E-07	0.00E+00	2.66E-07	0.00E+00	0.00E+00	2.66E-07	2.66E-07		
0005	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
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	2.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.89E-08		
0012	0.00E+00	8.97E-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	0.00E+00	0.00E+00	0.00E+00	8.97E-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	0.00E+00	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	
0016	0.00E+00	4.37E-06	0.00E+00	4.37E-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	0.00E+00	4.37E-06	
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	3.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.17E-05	0.00E+00	0.00E+00	3.17E-05	
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	3.51E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.51E-09	0.00E+00	0.00E+00	3.51E-09	
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	1.23E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-11	0.00E+00	0.00E+00	1.23E-11	
0025	0.00E+00	1.11E-08	0.00E+00	1.11E-08	0.00E+00	1.11E-08	0.00E+00	0.00E+00	0.00E+00	1.11E-08	1.11E-08	0.00E+00	0.00E+00	1.11E-08	
0026	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-10	0.00E+00	0.00E+00	2.03E-10	
SUM	1.31E-04	1.45E-04	0.00E+00	1.36E-04	0.00E+00	3.23E-05	0.00E+00	2.66E-07	0.00E+00	2.77E-07	3.22E-05	0.00E+00	2.66E-07	1.45E-04	380641 3738324

APPENDIX D

NEW HEATER UNIT B-401 AMBIENT AIR QUALITY ANALYSIS

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Philips 66
Los Angeles Refinery
Ambient Air Quality Analysis
New Heater Unit B-401

December 15, 2017

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Phillips 66
Los Angeles Refinery
Ambient Air Quality Analysis
New Heater Unit B-401

FACILITY DESCRIPTION

The Phillips 66 Los Angeles Refinery operates at two different sites in the South Coast Air Basin, which is a subarea of the South Coast Air Quality Management District's (AQMD) area of jurisdiction. One of the sites is located in the City of Carson (Carson Plant) and the other site is in the City of Los Angeles in the Wilmington community (Wilmington Plant).

The Carson Plant is bounded on the north by Sepulveda Boulevard; on the west by Wilmington Avenue; on the south by railroad tracks; and on the east by Alameda Boulevard. Property to the north of the Carson Plant is occupied by another refinery. The western boundary of the Carson Plant borders a shipping and container storage facility. Property across Wilmington Boulevard includes a residential neighborhood to the northwest and commercial uses to the southwest. Land uses to the south of the Carson Plant are heavy industrial. Land south of Lomita Avenue is dominated by port-related activities. Land east of Alameda Street is occupied by a storage tank farm and the Tesoro Refinery.

The Phillips 66 Wilmington Plant consists of approximately 400 acres and is located in Los Angeles County at 1660 West Anaheim Street, Wilmington, California (see Figure 1). The eastern part of the Wilmington Plant borders a residential area, a roofing materials plant, and a portion of the Harbor 110 Freeway. The northern portion of the site borders Harbor Lake Park, Harbor College, Harbor Golf Course, and a small residential area. The western part of the site borders Gaffey Street including a firing range, vacant fields, recreational fields, and a U.S. Navy fuel storage facility. Finally, the southern portion of the site shares a border with a warehouse facility.

INTRODUCTION

The Phillips 66 Los Angeles Refinery first proposed modifications to produce Ultra Low Sulfur Diesel (ULSD) in 2004 to comply with the federal, state, and South Coast AQMD regulations that limit the sulfur content of diesel fuels. As the lead agency, pursuant to the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (South Coast AQMD) prepared a Negative Declaration, an Addendum, and a Subsequent Negative Declaration for the required modifications.

Following legal challenge, the California Supreme Court concluded that there were certain deficiencies in previously prepared CEQA documents for the Phillips 66 ULSD Project and required the South Coast AQMD to prepare an EIR to analyze the air quality impacts of the Project. The decision by the California Supreme Court resulted in decertification of the previously prepared CEQA documents but did not require that the issuance of required permits for the project be set aside. As a result, a Draft EIR was prepared and a Final EIR is being prepared for the ULSD Project as required by the California Supreme Court to correct deficiencies identified in the Court's decision and satisfy the court's request. However, the Refinery modifications proposed as part of the ULSD Project have been completed and Phillips 66 has been producing ULSD at its Los Angeles Refinery since 2006, as required by federal, state, and South Coast AQMD ULSD regulations.

The 2004 Final Negative Declaration included an analysis of the reactor charge heater B-201 which was removed from service, demolished, and replaced with a functionally identical replacement heater referred to as B-401. The heater had to be replaced to reduce the pressure drop through the tubes at the higher reactor inlet pressure, and to ensure the heater would meet the current American Petroleum Institute Standard No. 560, Fired Heaters for General Refinery Services, at all expected firing rates. Consistent with current South Coast AQMD policy, the air quality permit was updated to include the equipment's maximum design rating. Best Available Control Technology (BACT) for the new heater was determined to be low NOx burners and a Selective Catalytic Reduction Unit for NOx control[1]. NOx emissions from replacement charge heater B-401 were limited to a concentration of five parts per million by volume (ppmv). BACT for CO and SOx control was 10 ppmv CO and 40 ppm total reduced sulfur, respectively.

EMISSION ESTIMATES

The emissions estimates associated with B-401 are based on 34 mmbtu per hour refinery fuel gas fired external fired heater. Best available control technology (BACT) considerations were used in these calculations when creating a worst-case scenario for the evaluation. The unit is estimated to operate 8,760 hours per year, a maximum 24 hours per day, 365 days per year. The calculated emissions are presented in Table 1.

AMBIENT AIR QUALITY STANDARDS

The Clean Air Act, which was established in 1963 and last amended in 1990, requires United States Environmental Protection Agency (EPA) to set national ambient air quality standards (AAQS) for pollutants which may be harmful to the public health and environment. The Clean Air Act identifies two types of national AAQS. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

California also has AAQS, which were established in 1969 and amended in 2002. California law continues to mandate state standards, although attainment of the national standards has precedence over attainment of the state standards due to federal penalties for failure to meet federal attainment deadlines. Further, the local agency (South Coast AQMD) Regulations XIII and XX set standards for permit projects in order to comply with both federal and state standards.

South Coast AQMD Regulations XIII and XX require permit projects to verify compliance with state and federal AAQS through the use of screening thresholds or air quality modeling. Screening thresholds were designed to assist applicants by establishing allowable emissions for both

[1] As analyzed in the 2004 Final Negative Declaration, ultra low NOx burners were originally considered to be BACT for the ULSD Project. However, upon further engineering review by South Coast AQMD staff, it was concluded that SCR in addition to low NOx burners constituted BACT for the Project. As a result, the 2005 Final Subsequent Negative Declaration was prepared to analyze the change in BACT from ultra low NOx burners to low NOx burners and SCR.

combustion and noncombustion sources. If the emissions are less than the allowable emissions, a significant change (increase) in air quality concentration will not occur at any receptor location, no state or national ambient air quality standards are exceeded, and no further analysis is required. If the emissions are greater than the allowable emissions, a more detailed air quality modeling analysis is required. Table 2 shows the South Coast AQMD Rule 1303 screening analysis for heater B-401.

CRITERIA POLLUTANT IMPACT MODELING

The Draft EIR for Phillips 66 Los Angeles Refinery ULSD Project determined that the emissions from heater B-401 were less than the allowable emissions threshold for a 30 to 40 mmbtu per hour combustion source under South Coast AQMD Rule 1303 such that no modeling was required. However, a more detailed air quality modeling analysis was prepared to confirm the conclusion of the Draft EIR. Generally, the more detailed air quality model is only prepared when the calculated emissions exceed the allowable emissions under South Coast AQMD Rule 1303. This is because the allowable emissions under Rule 1303 were developed using conservative assumptions for the source and the project site, and as previously mentioned, a significant change (increase) in air quality concentration will not occur at any receptor location and no state or national ambient air quality standards are exceeded. The more detailed modeling analysis uses site specific parameters, which are more accurate, to determine the groundlevel concentrations of pollutants emitted by sources associated with heater B-401. The groundlevel concentrations are then compare to the state and federal AAQS.

In order to determine the groundlevel concentrations, the U.S. EPA AERMOD (version 16216r) air dispersion model was used to calculate the annual average and maximum 1-hour, 3-hour, 8-hour, and 24-hour concentrations. The location of the source was identified based on data provided by Phillips 66 and the Long Beach USGS Quadrangle (see attached Figures 1 and 2). Unitized emissions rates were used in the AERMOD model. Per South Coast AQMD guidelines, the AERMOD model was run using the most recent meteorological data (2006-2011). The meteorological data was representative of Long Beach, California, the closest meteorological station to the Phillps 66 Wilmington Refinery. The AERMOD model used all regulatory default settings.

AERMOD includes algorithms to model the effects of building downwash on emissions from nearby or adjacent point sources. The model makes use of direction-specific information for all building downwash cases. Terrain elevations were also taken into account (see Figure 2).

For most combustion sources, only a fraction of the NOx emissions coming from the stack is actually NO_2. NO_2 forms as nitrogen oxide (NO) interacts with the ozone in the atmosphere. The longer NO is exposed to ozone, the higher the conversion rate to NO_2. As such, NOx to NO_2 conversion becomes a function of distance from the stack and ambient ozone concentration. The model used the Ambient Ratio Method (EPA Tier 2 analysis) outlined in the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W).

The AERMOD model is run using a receptor grid of 100 meters, and extends at least 1,000 meters in every cardinal direction from the boundaries of the Refinery (see Figure 2).

The maximum impact location for a receptor is determined from the applicable averaging periods from the AERMOD model output. The maximum groundlevel concentration and the Universal Tranverse Mercator (NAD 84) coordinates for each maximum impacted receptor are presented in Table 3. An electronic copy of the model is presented in Appendix A.

CRITERIA POLLUTANT IMPACT ANALYSIS

The unit maximum groundlevel concentrations are compared to the significance thresholds established in South Coast AQMD Rules 1303 and 2005 to demonstrate that the project will not cause a violation of any state or federal AAQS. The AAQS were established to protect public health and the environment.

In order to compare the modeled results with the established AAQS, the ambient background concentrations of certain criteria pollutants are required. The ambient air quality data for South Coastal Los Angeles County (Station No. 072 and 033), the closest meteorological stations to the Phillips 66 Los Angeles Refinery is used to establish background levels of CO, NO_2, PM10, and PM2.5. Unlike state thresholds, federal NOx and SOx ambient background concentrations are based on the 98^{th} and 99^{th} percentile of the last 3 years of data, respectively. Table 4 identifies the ambient background concentrations of these pollutants at Station No. 072 for the last three published years (2014, 2015, and 2016), as well as federal NO_2 and SOx ambient background concentration data published by South Coast AQMD.

The CO 1-hour, CO 8-hour, NO_2 1-hour, NO_2 annual average, SOx 1-hour, SOx 3-hour, SOx 24-hour, and SOx annual average concentrations are combined with the ambient background concentrations and compared to the Most Stringent Air Quality Standard (State and Federal standards). The PM10 and PM2.5 24-hour, and PM10 and PM2.5 annual average concentrations are compared to the Significant Change in Air Quality Concentration thresholds established by the South Coast AQMD, since the South Coast Air Basin does not meet the AAQS for these pollutants and is designated "nonattainment" for these pollutants.

State Standards

The maximum CO impact concentrations for 1-hour and 8-hour averages are 4,597.96 and 2,988.55 micrograms per cubic meter ($\mu g/m^3$), respectively. The maximum NO_2 impact concentrations for 1-hour and annual averages are 255.00 and 39.09 $\mu g/m^3$, respectively. The maximum SOx impact concentrations for 1-hour and 24-hour averages are 98.84 and 9.50 $\mu g/m^3$, respectively. The maximum PM10 impact concentrations for 24-hour and annual averages are 0.05 and 0.02 $\mu g/m^3$, respectively. The maximum PM2.5 impact concentrations for 24-hour and annual averages are 0.05 and 0.02 $\mu g/m^3$, respectively. Therefore, the modeling results are below all state criteria pollutant significance thresholds. The results are presented in Table 5.

Federal Standards

The maximum CO impact concentrations for 1-hour and 8-hour averages are 4,597.96 and 2,988.55 micrograms per cubic meter ($\mu g/m^3$), respectively. The maximum NO_2 impact concentrations for 1-hour and annual averages are 160.23 and 39.09 $\mu g/m^3$, respectively. The maximum SOx impact concentrations for 1-hour, 3-hour, 24-hour, and annual averages are 31.80, 31.67, 9.50, and 3.59 $\mu g/m^3$, respectively. The maximum PM10 impact concentrations for 24-hour and annual averages are 0.05 and 0.02 $\mu g/m^3$, respectively. The maximum PM2.5 impact concentrations for 24-hour and annual averages are 0.05 and 0.02 $\mu g/m^3$, respectively. Therefore, the modeling results are below all federal criteria pollutant significance thresholds. The results are presented in Table 6.

CONCLUSIONS

The screening air quality analysis in the Draft EIR for the Phillps 66 Los Angeles Refinery ULSD Project determined that no significant changes in air quality and no exceedances of any state or federal AAQS for CO, NOx, SOx, PM10, and PM2.5 would occur due to heater B-401. A more detailed air quality modeling analysis was prepared to confirm the conclusion of the Draft EIR. The more detailed air quality modeling analysis confirm the screening results presented in the Draft EIR that heater B-401 results in no significant changes in air quality and no exceedances of any state or federal AAQS.

MRB:mc

Attachments

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TABLES

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TABLE 1

Phillips 66 Los Angeles Refinery - B-401
Source Parameters and Criteria Pollutant Emission Rates

Source	UTME	UTMN	Height (ft)	Temperature (F)	Diameter (ft)	Velocity (ft/s)
Heater B-401	380869.9	3737598.4	150	785	4.7	3.6

	CO	VOC	NOx	SOx	PM10	PM2.5
Emission Factor (lb/mmscf)		7			7.5	7.5
Emission Factor (lb/hr)	0.25	0.23	0.21	0.17	0.24	0.24
Emission Factor (lb/mmBtu)				0.0051		
Emissions (lbs/day)	6.04	5.4	4.96	4.19	5.83	5.83

Heater B-401 emissions based on maximum duty of 34 mmBtu/hr using permit-limitted emission factors or South Coast AQMD default factors, as appropriate.

Emission Calculation for CO (lbs/hr) = CONC x O x SV x Fd x FF

CONC	10 ppmv	CO Concentration
O	20.9%/(20.9%-3%)	Correction for 3% oxygen
SV	28.01 lb/lb-mol)/385.3 dscf/lb-mol)	Specific molar volume
Fd	8710 dscf/mmBtu	Dry Fuel Factor for gas
FF	34 mm Btu/hr	Fuel Flow Rate

Emission Calculation for NOx (lbs/hr) = CONC x O x SV x Fd x FF

CONC	5 ppmv	CO Concentration
O	20.9%/(20.9%-3%)	Correction for 3% oxygen
SV	46.01 lb/lb-mol)/385.3 dscf/lb-mol)	Specific molar volume
Fd	8710 dscf/mmBtu	Dry Fuel Factor for gas
FF	34 mm Btu/hr	Fuel Flow Rate

Emission Calculation for SOx (lbs/hr) = x CONC/HHV/SV x MW x HD

CONC	40 ppm	CO Concentration
HHV	1316 Btu/scf	High heat value
SV	379 dscf/lb-mol	Specific molar volume as SO2
MW	64.07 lb/lb-mole	Molecular weight
HD	34 mm Btu/hr	Heater Duty

Emission Calculation for VOC, PM10, PM2.5 = EF x 24/HH x FF

EF	Emission Factor (lb/mmscf) (7 for VOC and 7.5 PM10/PM2.5)
24	Operating Hours Per Day
HH	High heating value (1050 mmscf/Btu)
FF	Fuel Flow Rate (34 mmBtu/hr)

TABLE 2

Phillips 66 Los Angeles Refinery - B-401
South Coast AQMD Rule 1303 Screening Analysis

	CO	VOC	NOx	SOx	PM10	PM2.5
Emission Factor (lb/hr)	0.25	0.23	0.21	0.17	0.24	0.24
South Coast AQMD Rule 1303 Thresholds[(a)]	72.1	NA	1.31	NA	7.9	NA
Significant?	NO	NA	NO	NA	NO	NA

(a) Thresholds for a combustions source between 30 and 40 mmbtu/hr.

TABLE 3

Phillips 66 Los Angeles Refinery - B-401
Criteria Pollutant Groundlevel
Concentration Calculations

Criteria Pollutant	Averaging Period	Modeled GLC ($\mu g/m^3$)	UTM Coordinates	
			Easting	Northing
CO	1-hr	0.36	385420.31	3738238.44
	8-hr	0.11	385350.75	3738263.38
NO_2	1-hr	0.12	385420.31	3738238.44
	Annual	0.01	385413.75	3738300.12
SO_2	1-hr	0.25	385420.31	3738238.44
	3-hr	0.12	385350.75	3738263.38
	24-hr	0.04	385350.75	3738263.38
	Annual	0.01	385413.75	3738300.12
PM10	24-hr	0.05	385350.75	3738263.38
	Annual	0.02	385413.75	3738300.12
PM2.5	24-hr	0.05	385350.75	3738263.38
	Annual	0.02	385413.75	3738300.12

GLC = Groundlevel Concentration

PM2.5 = PM10

TABLE 4

Phillips 66 Los Angeles Refinery - B-401
Criteria Pollutant Ambient
Concentration Calculations

Criteria Pollutant	Averaging Period	Concentration (ppm)			Max Conc.		Federal 1-hr Conc.	
		2014	2015	2016	(ppm)	($\mu g/m^3$)	(ppm)	($\mu g/m^3$)
CO	1-hr	4	3.3	3.3	4	4597.60		
	8-hr	2.6	2.2	2.2	2.6	2988.44		
NO_2	1-hr	0.135	0.101	0.0756	0.135	254.88	0.08	160.11
	AAM	0.0207	0.0198	0.0185	0.0207	39.08		
SO_2	1-hr	0.0147	0.0375	0.0178	0.0375	98.59	0.01	31.55
	3-hr	0.0147	0.0375	0.0178	0.0375	98.59		
	24-hr	0.003	0.0029	0.0036	0.0036	9.46		
	AAM	0.00132	0.00099	0.00092	0.00132	3.47		
		Concentration ($\mu g/m^3$)						
PM10	24-hr	59	62	56		62.00		
	AAM	26.6	26.5	27.8		27.80		
PM2.5	24-hr	52.2	48.3	28.93		52.20		
	AAM	10.72	10.26	9.62		10.72		

Data from Source No. 4 South Coastal LA County Station number 077 and 033.

AAM = Annual Arithmetic Mean

SO2 24-hr and annual data from EPA Outdoor Air Quality Data Monitor for Long Beach. 1-hr emissions used for 3-hr.

TABLE 5

Phillips 66 Los Angeles Refinery - B-401
State Significance Threshold Evaluation

Criteria Pollutant	Averaging Period	Ambient Background Conc. ($\mu g/m^3$)	Calculated Conc. ($\mu g/m^3$)	Total Conc. ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$)	Significant Change in Air Quality Conc. ($\mu g/m^3$)	Below Threshold? Yes/No
CO	1-hr	4597.60	0.36	**4597.96**	**23000**	1100	Yes
	8-hr	2988.44	0.11	**2988.55**	**10000**	500	Yes
NO_2	1-hr	254.88	0.12	**255.00**	**339**	20	Yes
	AAM	39.08	0.01	**39.09**	**57**	1	Yes
SO_2	1-hr	98.59	0.25	**98.84**	**655**	NA	Yes
	24-hr	9.46	0.04	**9.50**	**105**	NA	Yes
PM10	24-hr	62.00	**0.05**	62.05	50	**2.5**	Yes
	AAM	27.80	**0.02**	27.82	20	**1**	Yes
PM2.5	24-hr	52.20	**0.05**	52.25	35	**2.5**	Yes
	AAM	10.72	**0.02**	10.74	12	**1**	Yes

Evaluation Criteria **Bolded**

TABLE 6

Phillips 66 Los Angeles Refinery - B-401
Federal Significance Threshold Evaluation

Criteria Pollutant	Averaging Period	Ambient Background Conc. ($\mu g/m^3$)	Calculated Conc. ($\mu g/m^3$)	Total Conc. ($\mu g/m^3$)	Most Stringent Air Quality Standard ($\mu g/m^3$)	Significant Change in Air Quality Conc. ($\mu g/m^3$)	Below Threshold? Yes/No
CO	1-hr	4597.60	0.36	**4597.96**	**40000**	1100	Yes
	8-hr	2988.44	0.11	**2988.55**	**10000**	500	Yes
NO_2	1-hr	160.11	0.12	**160.23**	**188**	20	Yes
	AAM	39.08	0.01	**39.09**	**100**	1	Yes
SO_2	1-hr	31.55	0.25	**31.80**	**197**	NA	Yes
	3-hr	31.55	0.12	**31.67**	**1314**	NA	Yes
	24-hr	9.46	0.04	**9.50**	**105**	NA	Yes
	AAM	3.47	0.01	**3.48**	**80**	NA	Yes
PM10	24-hr	62.00	**0.05**	62.05	150	**2.5**	Yes
	AAM	27.80	**0.02**	27.82	NA	**1**	Yes
PM2.5	24-hr	52.20	**0.05**	52.25	35	**2.5**	Yes
	AAM	10.72	**0.02**	10.74	15	**1**	Yes

Evaluation Criteria **Bolded**

FIGURES

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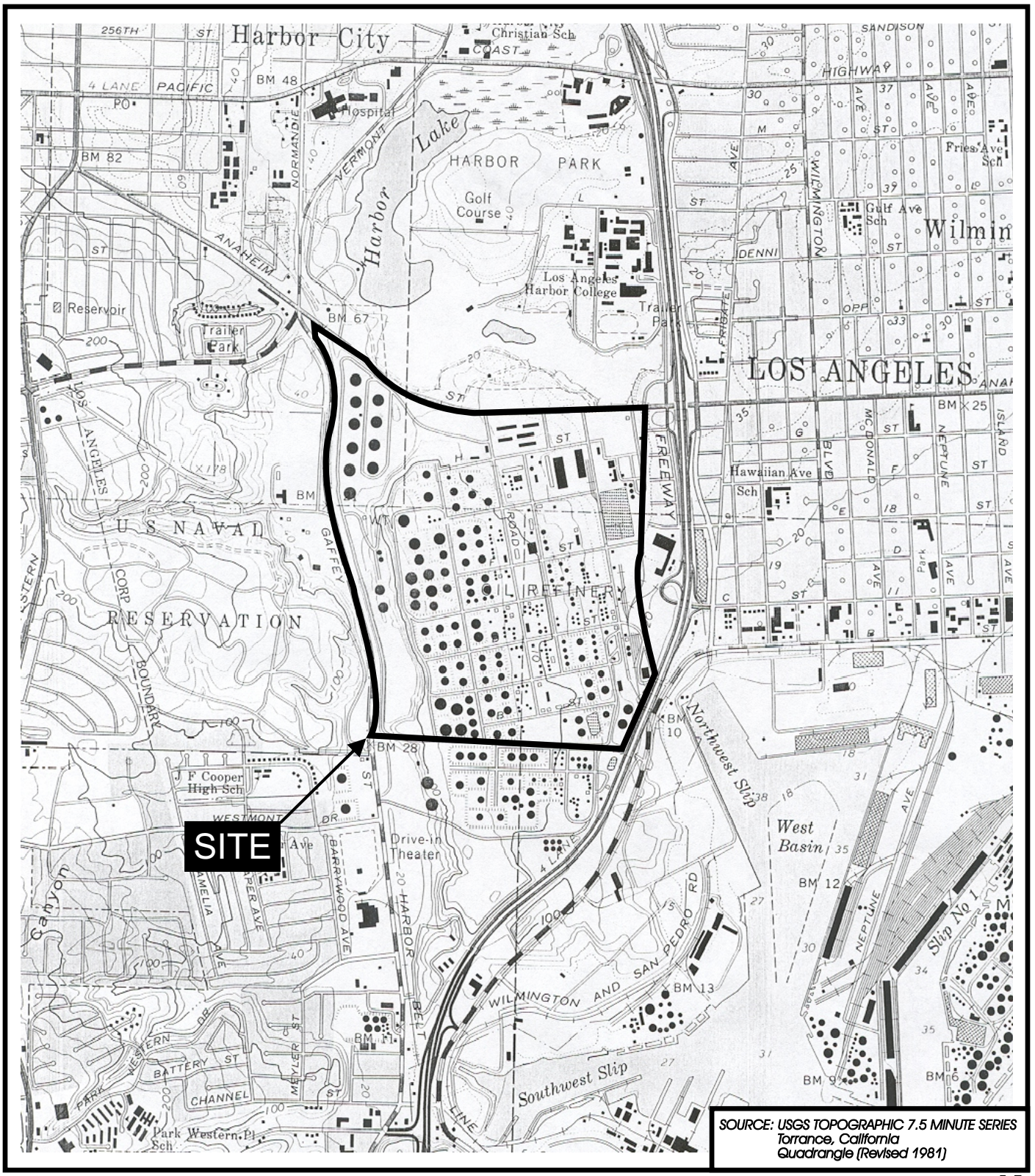
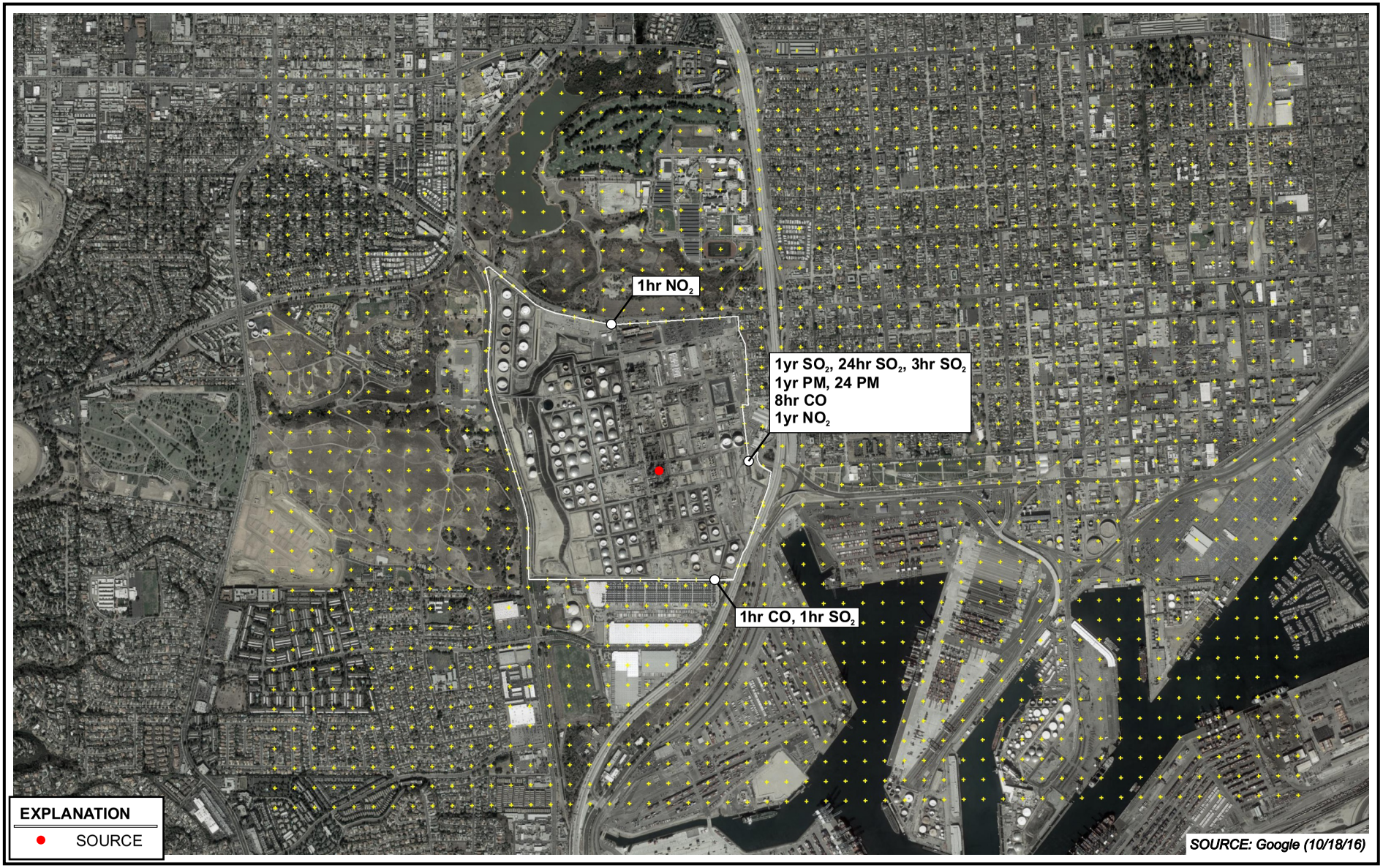


Environmental Audit, Inc.

FIGURE 1
SITE LOCATION MAP
Phillips 66 Los Angeles Refinery
Wilmington Plant

Project No. 2696

N:\2696\Response to Comments\Site Location Map (rev.2).cdr



ENVIRONMENTAL AUDIT, INC.

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FIGURE 2
POST-PROJECT - MAX IMPACT LOCATION MAP
Phillips 66 Los Angeles Refinery
Wilmington Plant

Project No. 2696
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APPENDIX A

AERMOD Model Electronic Files

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Electronic Modeling files are on file at the South Coast AQMD. Please contact Barbara Radlein at (909) 396-2716 or at bradlein@aqmd.gov for more information.

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