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JUN 18 2002

R137

June 13, 2002

Mr. Don Hwang
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: *Risk-Based Corrective Action Evaluation*
Former Chevron Service Station No. 9-0019
210 Grand Avenue, Oakland, California
Report No. DG90019G.3C01

Mr. Hwang:

At the request of Chevron Products Company (Chevron), Delta Environmental Consultants, Inc. network associate Gettler-Ryan Inc. (GR) is submitting this report to document the results of implementation of the Risk-Based Corrective Action (RBCA) planning process, as described in ASTM E2081-00 "Standard Guide for Risk-Based Corrective Action". This Tier 2 RBCA was conducted with site-specific data from the former Chevron service station located at 210 Grand Avenue, in Oakland, California. This RBCA was prepared in response to a letter from the Alameda County Health Care Services (ACHCS), dated September 20, 2001, requesting that a RBCA be prepared to evaluate TPHg and a future residential use scenario. The purpose of this work was to evaluate whether the residual hydrocarbons in the site soils and groundwater pose a risk to human health. This report describes site conditions and the RBCA model results for the site (Groundwater Services, Inc. RBCA Toolkit for Chemical Releases, version 1.3a).

Risk-Based Corrective Action (RBCA)

Tier 1 of the RBCA process involves comparison of the site constituent concentrations to generic Risk-Based Screening Levels (RBSL) to evaluate whether further evaluation and/or active remediation is warranted. RBSL values are derived from standard exposure equations and reasonable maximum exposure (RME) estimates per U.S. EPA guidelines. RBSL concentrations are designed to be protective of human health even if exposure occurs directly within the onsite area of impacted soil or groundwater, and inherently provides conservative estimates of potential threats to human health and the environment. According to the RBCA process, if Tier 1 limits are not exceeded, the user may proceed directly to compliance monitoring and/or no further action. However, if these defined screening levels are exceeded, the affected media may be addressed by: 1) remediating to the generic Tier 1 limits, if practicable; 2) conducting Tier 2 evaluation to develop site-specific remediation goals; or 3) implement an interim remedial action to abate risk "hot spots". Tier 2 analysis evaluates baseline risks both on and offsite, utilizing site specific soil, groundwater and air parameters. Additionally, Tier 2 analyses allow the use of transport models in calculating risks and cleanup standards related to offsite receptors, and utilizes Site Specific Target Levels (SSTL). The SSTL is a chemical of concern (COC) concentration limit (clean-up level) in the source medium derived by multiplying the risk-based exposure limit at the point of exposure by the natural attenuation factor for the exposure pathway.

Site Parameters

Complete exposure pathways are those that could pose a reasonable potential for contaminant contact with human or environmental receptors. Under Tier 2 RBCA, both onsite and offsite receptors apply. For the purpose of this Tier 2 evaluation, a residential exposure pathway with a risk factor of $1.0E-5$ was evaluated for the site (Oakland Risk Based Corrective Action: Technical Background Document, January 1, 2000). Groundwater beneath and in the site vicinity is not used for drinking water purposes, therefore, groundwater ingestion or subsurface soil leaching to groundwater (ingestion) exposure pathways are not complete. As requested by the ACHCS in their September 20, 2001 letter, the following risk pathways were evaluated: subsurface soil and groundwater volatilization to indoor and outdoor air; and ingestion, dermal contact and inhalation from surficial and subsurface soils.

Where available, site specific physical data were used in this RBCA evaluation. Site specific parameters included contaminated soil area ($1,200 \text{ ft}^2$), depth to top of affected soil (5 ft), soil type (silty sand), length of affected soil parallel to wind (100 ft) and thickness of affected subsurface soils (2 ft). The depth of groundwater is estimated to be approximately 7 feet below ground surface (GR Second Semi-Annual Event of September 10, 2001 Groundwater Monitoring and Sampling Report). Where appropriate and consistent with site conditions, default values were used. The Chemicals of Concern (COC) were evaluated with a conservative 95% Upper Control Limit (UCL) factor as well as the California adjusted oral slope factor for benzene (0.1) for this RBCA analysis. TPHg was evaluated by inputting the reported TPHg values from soil and groundwater into the aromatic fraction C08-C10 (Total Petroleum Hydrocarbon Criteria Working Group Series, Volume 5, June 1999).

Results of RBCA Analysis

Based on information from previous site investigations and groundwater monitoring and sampling data, the Tier 2 RBCA program evaluated the complete exposure pathways identified at the site. The RBCA program findings for the identified pathways are surface soil exposure with a cumulative risk factor of $1.4E-6$, and subsurface soil and groundwater volatilization to outdoor and indoor air exposures with cumulative risk factors of $8.3E-8$ and $9.0E-6$, respectively (Appendix A, Tier 2 Baseline Risk Summary Table). Using the residential risk factor of $1.0E-5$ and site conditions, the SSTLs for BTEX, MtBE and TPHg were determined to be below established Tier 2 SSTLs (Appendix A, SSTL Values). According to the RBCA decision making process, no further work is warranted to protect against exposure via these pathways. Pertinent input and output data including site specific parameters used in the analysis are presented in Appendix A.

Conclusions And Recommendations

GR performed the RBCA evaluation for the assessment and response to petroleum hydrocarbons in the subsurface soil and groundwater beneath the subject site. A Tier 2 evaluation was performed utilizing available site specific data. The results of these analyses confirm that current site conditions do not exceed the calculated Tier 2 SSTLs specific to the site (Appendix A). Based on the RBCA program and findings

Mr. Don Hwang
June 13, 2002
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presented in this report, it is GR's opinion that no further work is warranted and the site should be considered for case closure.

If you have any questions or comments on the enclosed materials please feel free to contact us at (916) 631-1300.

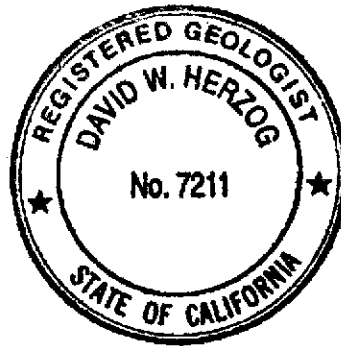
DELTA ENVIRONMENTAL CONSULTANTS, INC.
Network Associate **GETTLER-RYAN INC.**

Jed A. Douglas for

Jed A. Douglas
Project Geologist

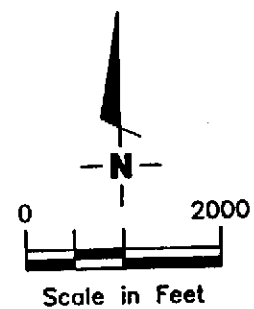
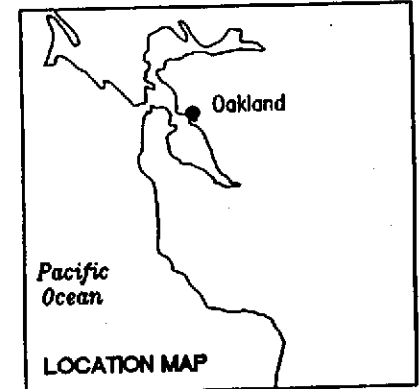
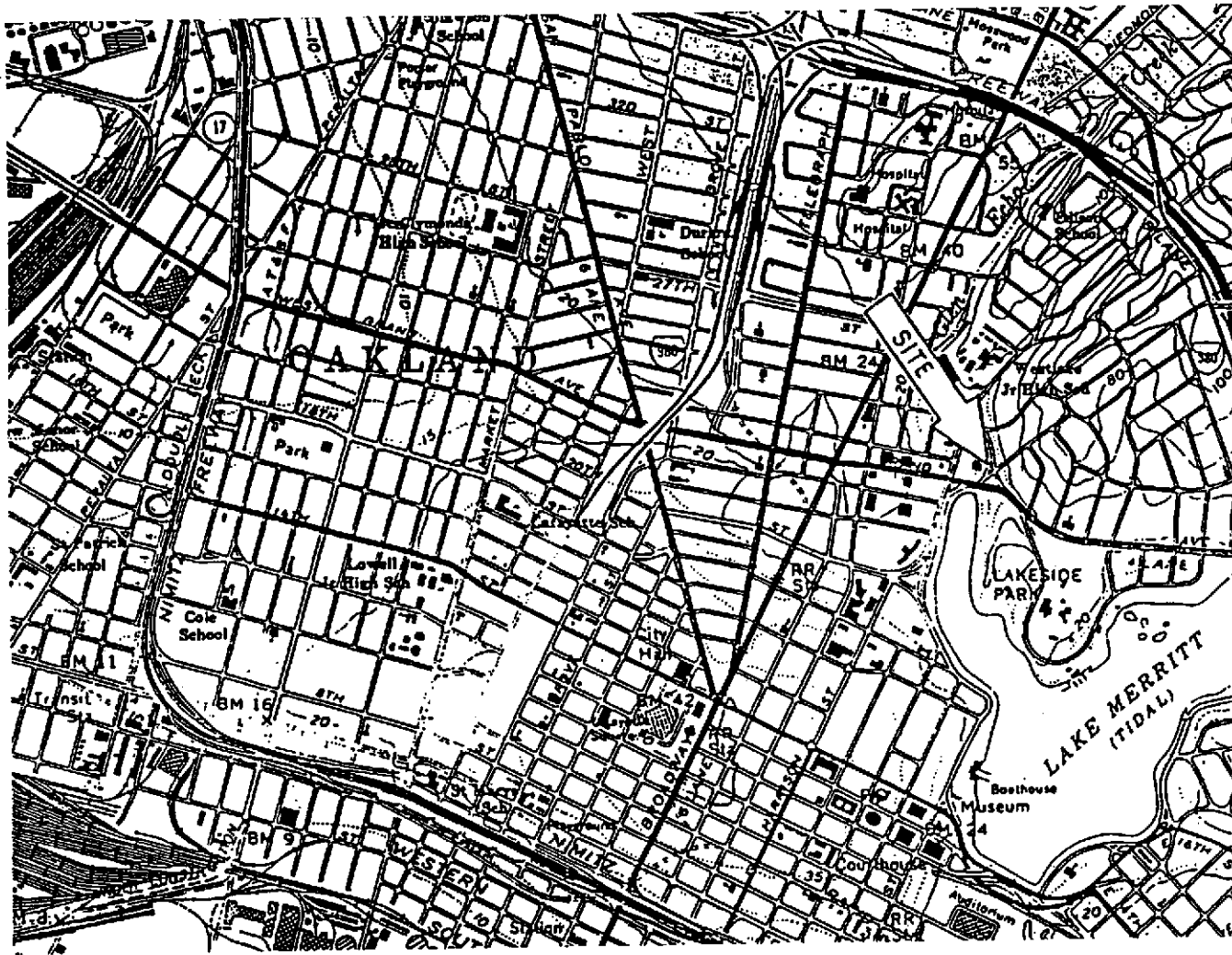
David W. Herzog

David W. Herzog
Senior Geologist
R.G. 7211



Attachments: Figure 1. Site Location Map
Figure 2. Site Plan
Tier 2 RBCA Input/Output Data

Cc: Ms. Karen Streich, Chevron Products Company, P.O. Box 6004, San Ramon, CA 94583
Mr. Jim Brownell, Delta Environmental Consultants, Inc.



Base Map: USGS Topographic Map



Gettler - Ryan Inc.

6747 Sierra Ct., Suite J (925) 551-7555
Dublin, CA 94568

VICINITY MAP

Former Chevron Service Station #9-0019
210 Grand Avenue
Oakland, California

FIGURE 1

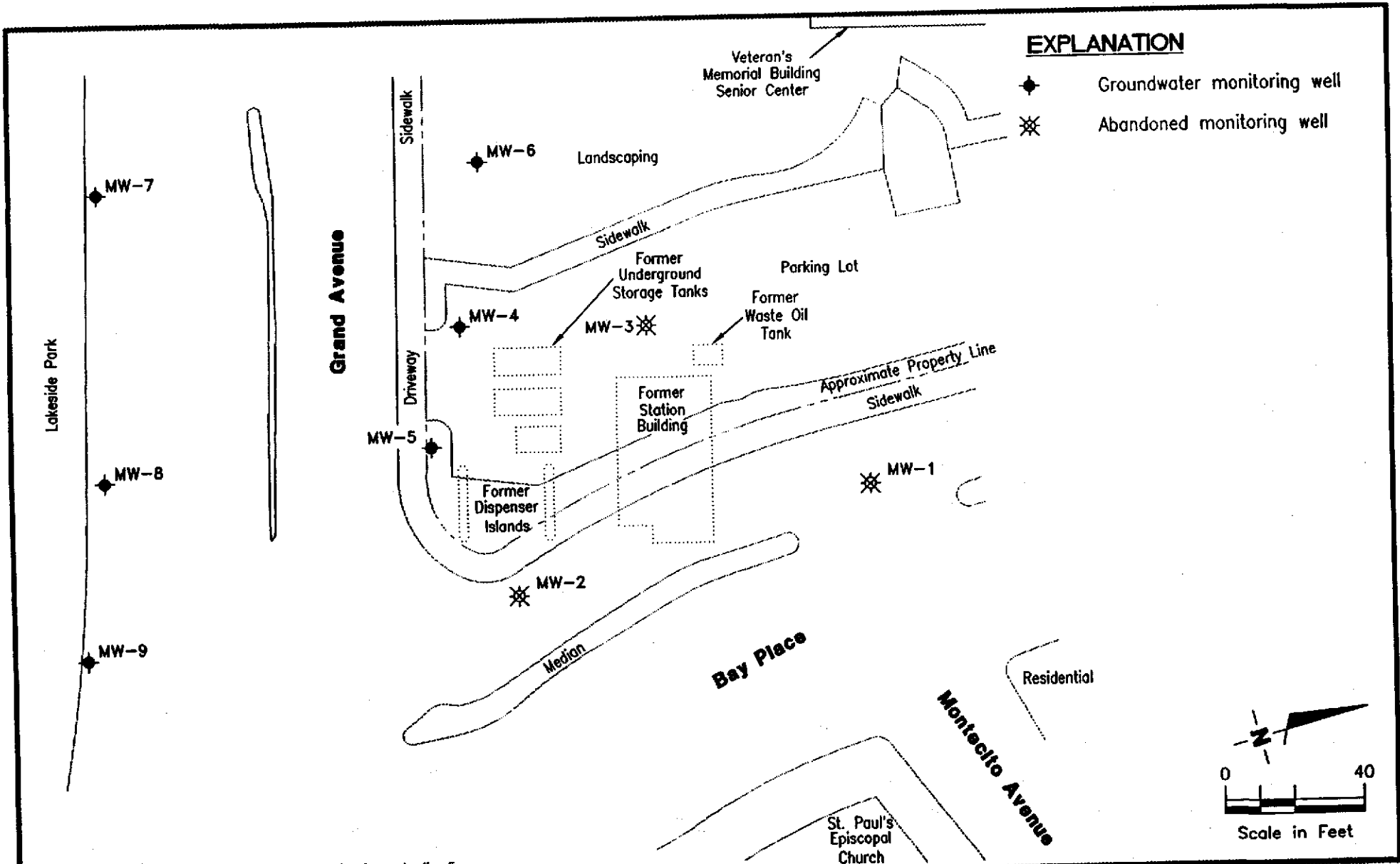
JOB NUMBER
346500.02

REVIEWED BY



DATE
02/00

REVISED DATE



Source: Figure Modified From Drawing Provided by RRM engineering contracting firm

FIGURE



Gettler - Ryan Inc.

6747 Sierra Ct., Suite J (925) 551-7555
Dublin, CA 94568

SITE PLAN

Former Chevron Service Station #9-0019
210 Grand Avenue
Oakland, CA

2

JOB NUMBER
346500.02

REVIEWED BY

DATE
02/00

REVISED DATE

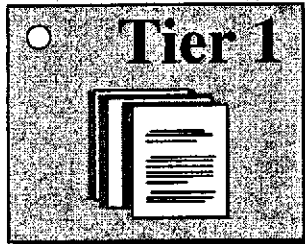
Main Screen

RBCA Tool Kit for Chemical Releases
Version 1.3a © 2000

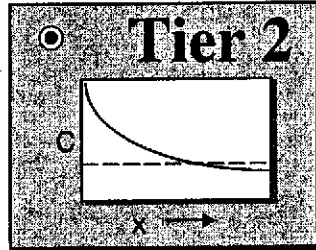
1. Project Information

Site Name:	Former Chevron SS No. 9-0019		
Location:	210 Grand Ave. Oakland, CA		
Compl. By:	J. Douglas		
Date:	6-May-02	Job ID:	DG90019G.3C01

2. Which Type of RBCA Analysis? ?



Tier 1
Generic Values
On-Site
Exposure



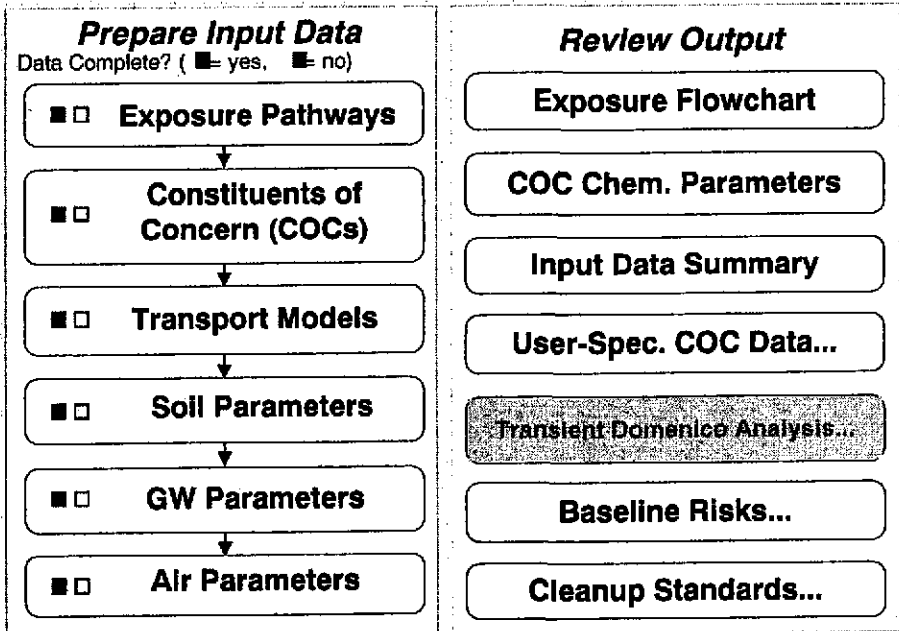
Tier 2
Site-Specific Values
On- or Off-Site Exposure

3. Calculation Options ?

Affects which Input data are required

- Baseline Risks (Forward mode)**
- RBCA Cleanup Standards (Backward mode)**

4. RBCA Evaluation Process

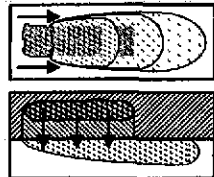


5. Commands and Options

New Site	Load Data...	Save Data As...	Quit
Print Sheet	Set Units	Custom Chem. Data...	Help

Exposure Pathway Identification

1. Groundwater Exposure (?)



**Groundwater Ingestion/
Surface Water Impact**

Receptor: None ▼ None ▼ None ▼
 Type: On-site Off-site1 Off-site2

Source Media:

Affected Groundwater

Affected Soils Leaching to Groundwater

Distance to GW receptors

0	0	0	(ft)
On-site	Off-site1	Off-site2	
0	0	0	(ft)

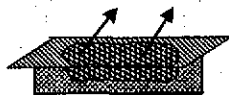
GW Discharge to Surface Water Exposure



- Swimming
- Fish Consumption
- Aquatic Life Protection

Enter ALP Criteria

2. Surface Soil Exposure (?)



**Direct Ingestion
and Dermal Contact**

Receptor: Res. ▼ No off-site receptors
 Type: On-site

Construction Worker

Site Name: Former Chevron SS No. 9-0019

Location: 210 Grand Ave. Oakland, CA

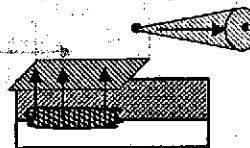
Compl. By: J. Douglas

Job ID: DG90019G.3C01

Date: 6-May-02

3. Air Exposure (?)

**Volatilization and Particulates
to Outdoor Air Inhalation**



Receptor: Res. ▼ None ▼ None ▼
 Type: On-site Off-site1 Off-site2
 0 0 0 (ft)

Construction worker

- Affected Soils--Volatilization to Ambient Outdoor Air
- Affected Groundwater--Volatilization to Ambient Outdoor Air
- Affected Surface Soils--Particulates to Ambient Outdoor Air



**Volatilization to
Indoor Air Inhalation**

Receptor: Res. ▼ No off-site receptors
 Type: On-site

- Affected Soils--Volatilization to Enclosed Space
- Affected Groundwater--Volatilization to Enclosed Space

4. Commands and Options

Main Screen

Print Sheet

Set Units

Help

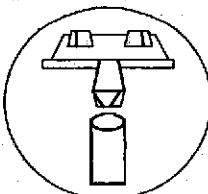
Exposure Factors & Target Risks

Exposure Flowchart

Exposure Factors and Target Risk Limits

1. Exposure Parameters

Age Adjustment?	Residential		Commercial	
	Adult	(Age 0-6) (Age 0-16)	Chronic	Construc.
Averaging time, carcinogens (yr)	70			
Averaging time, non-carcinogens (yr)	30		25	1
Body weight (kg)	70	15 35	70	
Exposure duration (yr)	30	6 16	25	1
Exposure frequency (days/yr)	350		250	180
Dermal exposure frequency (days/yr)	350		250	
Skin surface area, soil contact (cm ²)	<input type="checkbox"/> 5800	2023	5800	5800
Soil dermal adherence factor (mg/cm ² /day)	1			
Water ingestion rate (L/day)	2		1	
Soil ingestion rate (mg/day)	<input type="checkbox"/> 100	200	50	100
Swimming exposure time (hr/event)	3			
Swimming event frequency (events/yr)	12	12 12		
Swimming water ingestion rate (L/hr)	<input type="checkbox"/> 0.05	0.5		
Skin surface area, swimming (cm ²)	<input type="checkbox"/> 23000	8100		
Fish consumption rate (kg/day)	0.025			
Contaminated fish fraction (unitless)	1			



Site Name: Former Chevron SS No. 9-0019
 Location: 210 Grand Ave. Oakland, CA
 Compl. By: J. Douglas
 Job ID: DG90019G.3C01 Date: 6-May-02

2. Risk Goal Calculation Options

- Individual Constituent Risk Goals Only
- Individual and Cumulative Risk Goals

3. Target Health Risk Limits

	Individual	Cumulative
Target Risk (Class A/B carcin.)	1.0E-5	1.0E-5
Target Risk (Class C carcinogens)	1.0E-5	
Target Hazard Quotient	1.0E+0	
Target Hazard Index		1.0E+0

4. Commands and Options

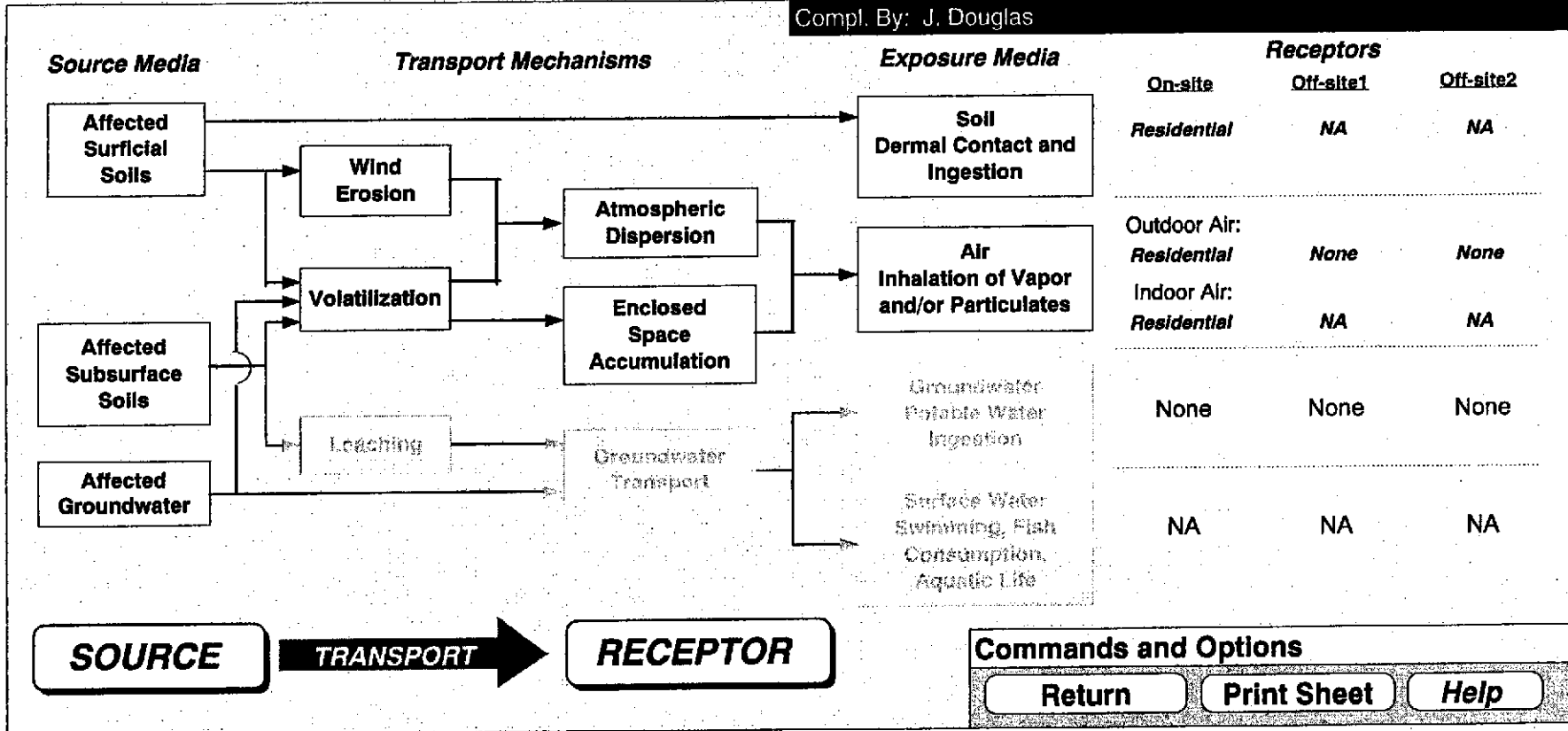
[Return to Exposure Pathways](#)

[Use Default Values](#) [Print Sheet](#)

[Help](#)

Exposure Pathway Flowchart

Site Name: Former Chevron SS No. 9-0019 Job ID: DG90019G.3C01
 Location: 210 Grand Ave. Oakland, CA Date: 6-May-02
 Compl. By: J. Douglas



Site Name: Former Chevron SS No. 9-0019
 Location: 210 Grand Ave. Oakland, CA
 Compl. By: J. Douglas

Job ID: DG90019G.3C01
 Date: 6-May-02

Commands and Options

Main Screen

Print Sheet

Help

Source Media Constituents of Concern (COCs)

Selected COCs

COC Select: **Sort List:** (?)

Benzene*
 Toluene
 Ethylbenzene
 Xylene (mixed isomers)
 Methyl t-Butyl ether
 TPH - Arom >C08-C10

* = Chemical with user-specified data

Representative COC Concentration (?)

Groundwater Source Zone

Enter Site Data

(mg/L)	note
3.7E-1	oral slope changed to 0.1
8.7E-1	
2.0E-1	
6.0E-1	
1.0E-1	
6.4E+0	

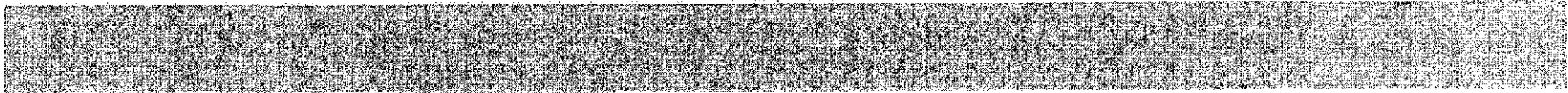
Soil Source Zone

Enter Site Data

(mg/kg)	note
2.4E+0	oral slope changed to 0.1
8.5E+0	
5.1E+0	
1.9E+1	
1.3E-3	
2.3E+2	

Apply Raoult's Law (?)
 Mole Fraction in Source Material

(?)



Commands and Options			Site Name: Former Chevron SS No. 95619: DG90019G.3C01				
<input type="button" value="Return"/> <input type="button" value="Print Sheet"/> <input type="button" value="Help"/>			Location: 210 Grand Ave. Oakland, CA		Date: 6-May-02		
			Compl. By: J. Douglas				
Groundwater Source Zone Concentration Calculator						UCL Percentile <input type="text" value="95%"/>	
			<input type="button" value="Paste Defaults"/>	<input type="button" value="Mean Option"/>			
<i>Constituent</i>	Detection Limit (mg/L)	No. of Samples	No. of Detects	Estimated Distribution of Data	Max. Conc. (mg/L)	Mean Conc. (mg/L)	UCL on Mean (mg/L)
Benzene*	5.0E-4	8	8	Lognormal	4.3E+0	1.6E-2	3.7E-1
Toluene	5.0E-4	8	8	Lognormal	1.7E+1	2.8E-2	8.7E-1
Ethylbenzene	5.0E-4	8	8	Lognormal	2.3E+0	1.1E-2	2.0E-1
Xylene (mixed isomers)	5.0E-4	8	8	Lognormal	7.2E+0	2.4E-2	6.0E-1
Methyl t-Butyl ether	2.5E-3	8	8	Lognormal	7.5E-1	1.1E-2	1.0E-1
TPH - Arom >C08-C10	5.0E-2	8	8	Lognormal	6.0E+1	5.4E-1	6.4E+0
* = Chemical with user-specified data							

RBCA Tool Kit for Chemical Releases, Version 1.3a

Enter Analytical Data from
Groundwater Source Zone
(up to 50 Data Points)

Analytical Data

	1	2	3	4	5	6	7	8	9	10	11	12	13
ID	MW-4	MW-4	MW-4	MW-4	MW-5	MW-5	MW-5	MW-5					
Date	10-Sep-01	21-Mar-01	29-Aug-00	28-Sep-99	10-Sep-01	21-Mar-01	29-Aug-00	10-Mar-00					
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	2.50E-4	2.50E-4	2.50E-4	2.50E-4	2.90E-2	2.50E+0	3.30E+0	4.28E+0					
	2.50E-4	2.50E-4	2.50E-4	6.90E-4	5.00E-2	7.30E+0	6.30E+0	1.71E+1					
	2.50E-4	2.50E-4	2.50E-4	2.50E-4	7.70E-3	1.50E+0	1.70E+0	2.28E+0					
	2.50E-4	2.50E-4	2.50E-4	9.01E-4	6.60E-2	4.20E+0	4.30E+0	7.21E+0					
	1.25E-3	1.25E-3	1.25E-3	2.50E-4	2.50E-3	7.50E-1	5.00E-1	5.00E-1					
	2.50E-2	2.50E-2	2.50E-2	2.50E-2	3.00E-1	2.60E+1	4.20E+1	5.98E+1					

Commands and Options			Site Name: Former Chevron SS NoJ950019DG90019G.3C01
<input type="button" value="Return"/>	<input type="button" value="Print Sheet"/>	<input type="button" value="Help"/>	Location: 210 Grand Ave. Oakland, CA Date: 6-May-02
			Compl. By: J. Douglas

Soil Source Zone Concentration Calculator

UCL
Percentile
95%

<i>Constituent</i>	Detection Limit	No. of Samples	No. of Detects	Estimated Distribution of Data	Max. Conc.	Mean Conc.	UCL on Mean
	(mg/kg)				(mg/kg)	(mg/kg)	(mg/kg)
Benzene*	5.0E-3	8	8	Lognormal	4.5E+0	1.2E+0	2.4E+0
Toluene	5.0E-3	8	8	Lognormal	1.6E+1	4.2E+0	8.5E+0
Ethylbenzene	5.0E-3	8	8	Lognormal	8.4E+0	2.7E+0	5.1E+0
Xylene (mixed isomers)	5.0E-3	8	8	Lognormal	3.2E+1	1.0E+1	1.9E+1
Methyl t-Butyl ether	2.5E-2	1	1	-	1.3E-3	1.3E-3	NA
TPH - Arom >C08-C10	5.0E-1	8	8	Lognormal	3.9E+2	1.3E+2	2.3E+2

* = Chemical with user-specified data

RBCA Tool Kit for Chemical Releases, Version 1.3a

Enter Analytical Data from
Soil Source Zone
(up to 50 Data Points)

Analytical Data

	1	2	3	4	5	6	7	8	9	10	11	12	13
ID	B1-5	B2-5	B3-5	B4-5	B5-5	OX1-4.5	OX2-4.5	OX3-5.5					
Date	9-Mar-89	9-Mar-89	9-Mar-89	9-Mar-89	9-Mar-89	14-Nov-96	14-Nov-96	14-Nov-96					
	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>
	2.50E-3	4.50E+0	8.60E-1	4.00E-1	3.40E+0	1.90E-1	5.40E-1	9.60E-3					
	2.50E-3	1.60E+1	2.50E+0	1.10E+0	1.30E+1	3.90E-1	7.80E-1	1.40E-2					
	2.50E-3	8.40E+0	2.30E+0	1.00E+0	8.30E+0	2.60E-1	1.30E+0	2.50E-3					
	2.50E-3	3.20E+1	1.00E+1	4.00E+0	2.90E+1	1.00E+0	4.80E+0	1.60E-2					
	1.25E-3												
	2.50E-1	3.40E+2	1.30E+2	3.00E+1	3.90E+2	1.60E+1	1.40E+2	2.50E-1					

RBCA SITE ASSESSMENT	Baseline Risk Summary-All Pathways
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Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	8.3E-8	1.0E-5	8.3E-8	1.0E-5	<input type="checkbox"/>	9.3E-3	1.0E+0	1.4E-2	1.0E+0	<input type="checkbox"/>
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	9.0E-6	1.0E-5	9.0E-6	1.0E-5	<input type="checkbox"/>	4.2E-1	1.0E+0	7.2E-1	1.0E+0	<input type="checkbox"/>
SOIL EXPOSURE PATHWAYS										
Complete:	1.4E-6	1.0E-5	1.4E-6	1.0E-5	<input type="checkbox"/>	2.4E-1	1.0E+0	2.8E-1	1.0E+0	<input type="checkbox"/>
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NA	NA	NA	NA	<input type="checkbox"/>	NA	NA	NA	NA	<input type="checkbox"/>
SURFACE WATER EXPOSURE PATHWAYS										
Complete:	NA	NA	NA	NA	<input type="checkbox"/>	NA	NA	NA	NA	<input type="checkbox"/>
CRITICAL EXPOSURE PATHWAY (Maximum Values From Complete Pathways)										
	9.0E-6	1.0E-5	9.0E-6	1.0E-5	<input type="checkbox"/>	4.2E-1	1.0E+0	7.2E-1	1.0E+0	<input type="checkbox"/>
	<i>Indoor Air</i>		<i>Indoor Air</i>			<i>Indoor Air</i>		<i>Indoor Air</i>		

RBCA SITE ASSESSMENT

Input Parameter Summary

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

Job ID: DG90019G.3C01

1 OF 1

Exposure Parameters	Residential		Commercial/Industrial		
	Adult	(1-12yrs)	(1-12yrs)	Children	Construction
AT _c	70				
AT _n	30			25	1
BW	70	15	35	70	
ED	30	6	16	25	1
τ	30			25	1
EF	350			250	180
EH _D	350			250	
IR _w	2			1	
IR _s	100	200		50	100
SA	5800		2023	5800	5800
M	1				
ET _{swim}	3				
EV _{swim}	12	12	12		
IR _{swim}	0.05	0.5			
SA _{swim}	23000		8100		
IR _{fish}	0.025				
F _{fish}	1				

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
Groundwater:			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
Applicable Surface Water Exposure Routes:			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
Soil:			
Direct Ingestion and Dermal Contact	Residential		
Outdoor Air:			
Particulates from Surface Soils	Residential	None	None
Volatilization from Soils	Residential	None	None
Volatilization from Groundwater	Residential	None	None
Indoor Air:			
Volatilization from Subsurface Soils	Residential	NA	NA
Volatilization from Groundwater	Residential	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	0	NA	NA	(ft)

Target Health Risk Values	Individual	Cumulative
TR _h Target Risk (class A&B carcinogens)	1.0E-5	1.0E-5
TR _c Target Risk (class C carcinogens)	1.0E-5	
THQ Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modelling Options	
RBCA tier	Tier 2
Outdoor air volatilization model	Surface & subsurface models
Indoor air volatilization model	Johnson & Ettinger model
Soil leaching model	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE: NA = Not applicable

Surface Parameters	General	Construction	(Units)
A	1.2E+3	NA	(ft ²)
W	1.0E+2	NA	(ft)
W _{gr}	NA	NA	(ft)
U _{av}	7.4E+0		(ft/s)
h _{mix}	6.6E+0		(ft)
P _s	6.9E-14		(g/cm ² /s)
L _{so}	1.0E+0		(ft)

Surface Soil Column Parameters	Value	(Units)
h _{cap}	3.0E-1	(ft)
h _v	6.7E+0	(ft)
ρ _s	1.7E+0	(g/cm ³)
f _{oc}	1.0E-1	(-)
θ _t	4.1E-1	(-)
K _{av}	8.6E+1	(cm/d)
k _v	1.1E-12	(ft ²)
L _{gw}	7.0E+0	(ft)
L _s	6.0E+0	(ft)
L _{base}	7.0E+0	(ft)
l _{soils}	2.0E+0	(ft)
pH	6.8E+0	(-)
θ _v	0.389	capillary vadosea foundation (-)
θ _a	0.041	0.12 0.26 (-)

Building Parameters	Residential	Commercial	(Units)
L _b	6.66E+0	NA	(ft)
A _b	7.53E+2	NA	(ft ²)
X _{ext}	1.12E+2	NA	(ft)
ER	1.40E-4	NA	(1/s)
L _{ext}	4.92E-1	NA	(ft)
Z _{ext}	4.92E-1	NA	(ft)
η	1.00E-3	NA	(-)
dP	0.00E+0	NA	(g/cm/s ²)
Q _a	0.00E+0	NA	(ft ³ /s)

Groundwater Parameters	Value	(Units)
h _{gw}	NA	(ft)
i _g	NA	(cm/yr)
U _{gw}	NA	(cm/d)
V _{gw}	NA	(cm/d)
K _s	NA	(cm/d)
I	NA	(-)
S _w	NA	(ft)
S _d	NA	(ft)
θ _{eff}	NA	(-)
f _{oc, gw}	NA	(-)
pH _{gw}	NA	(-)
Biodegradation considered?	NA	(-)

Transport Parameters	Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
Lateral Groundwater Transport	Groundwater Ingestion		Soil Leaching to GW		
α _x Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α _y Transverse dispersivity	NA	NA	NA	NA	(ft)
α _z Vertical dispersivity	NA	NA	NA	NA	(ft)
Lateral Outdoor Air Transport	Soil to Outdoor Air Inhal.		GW to Outdoor Air Inhal.		
α _y Transverse dispersion coefficient	NA	NA	NA	NA	(ft)
α _z Vertical dispersion coefficient	NA	NA	NA	NA	(ft)
ADF Air dispersion factor	NA	NA	NA	NA	(-)

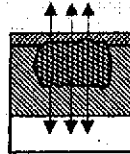
Surface Water Parameters	Off-site 2	(Units)
Q _{sw} Surface water flowrate	NA	(ft ³ /s)
W _{pl} Width of GW plume at SW discharge	NA	(ft)
h _{pl} Thickness of GW plume at SW discharge	NA	(ft)
DF _{sw} Groundwater-to-surface water dilution factor	NA	(-)

Transport Modeling Options

1. Vertical Transport, Surface Soil Column

Outdoor Air Volatilization Factors ?

- Surface soil volatilization model only
- Combination surface soil/Johnson & Ettinger models
- Thickness of surface soil zone (ft)
- User-specified VF from other model



Indoor Air Volatilization Factors ?

- Johnson & Ettinger model
- User-specified VF from other model

Soil-to-Groundwater Leaching Factor ?

- ASTM Model
 - Apply Soil Attenuation Model (SAM)
 - Allow first-order biodecay
- User-specified LF from other model

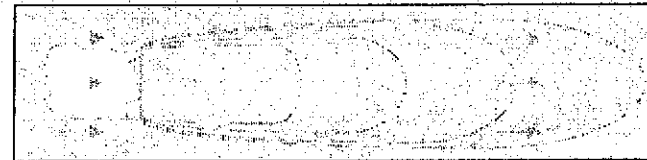
2. Lateral Air Dispersion Factor



- 3-D Gaussian dispersion model
 - User-Specified ADF
- Off-site 1 Off-site 2 (-)

Site Name: Former Chevron SS No. 9-0019 Job ID: DG90019G.3C01
 Location: 210 Grand Ave. Oakland, CA Date: 6-May-02
 Compl. By: J. Douglas

3. Groundwater Dilution Attenuation Factor



Calculate DAF using Domenico Model ?

- Domenico equation with dispersion only (no biodegradation)
- Domenico equation first-order decay
- Modified Domenico equation using electron acceptor superposition
 - Biodegradation Capacity (mg/L)

User-Specified DAF Values

- DAF values from other model
- or site data

4. Commands and Options

Site-Specific Soil Parameters

Site Name: Former Chevron SS No. 9-0019 Job ID: DG90019G.3C01
 Location: 210 Grand Ave. Oakland, CA Date: 6-May-02
 Compl. By: J. Douglas

1. Soil Source Zone Characteristics ?

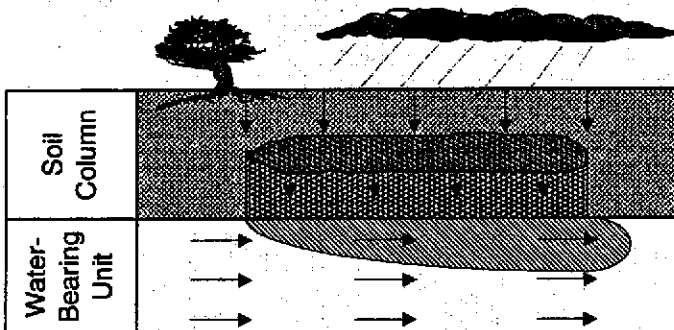
Hydrogeology

General Case Construction

Depth to water-bearing unit (ft)
 Capillary zone thickness (ft)
 Soil column thickness (ft)

Affected Soil Zone

Depth to top of affected soils (ft)
 Depth to base of affected soils (ft)
 Affected soil area (ft²)
 Length of affected soil parallel to assumed wind direction (ft)
 Length of affected soil parallel to assumed GW flow direction (ft)



2. Surface Soil Column ?

Vadose Zone Capillary Fringe

Predominant USCS Soil Type

SM: Silty Sand ?

or

Total porosity (-)
 Volumetric water content (-)
 Volumetric air content (-)
 Dry bulk density (kg/L)
 Vertical hydraulic conductivity (cm/d)
 Vapor permeability (ft²)
 Capillary zone thickness (ft)

Net Rainfall Infiltration

Net infiltration estimate (cm/yr)
 or
 Average annual precipitation (cm/yr)

Partitioning Parameters

Fraction organic carbon (-)
 Soil/water pH (-)

3. Commands and Options

Site-Specific Groundwater Parameters

Site Name: Former Chevron SS No. 9-0019 Job ID: DG90019G.3C01
 Location: 210 Grand Ave. Oakland, CA Date: 6-May-02

Compl. By: J. Douglas

1. Water-Bearing Unit ?

Hydrogeology

Groundwater Darcy velocity (cm/d)
 Groundwater seepage velocity (ft/d)
 or

Hydraulic conductivity (cm/d)
 Hydraulic gradient (-)
 Effective porosity (-)

Sorption

Fracton organic carbon-saturated zone (-)
 Groundwater pH (-)

2. Groundwater Source Zone ?

Groundwater plume width at source (ft)
 Plume (mixing zone) thickness at source (ft)
 or

Entrance thickness (ft)
 Length of source zone (ft)

The diagram illustrates a groundwater plume source zone. It shows a central source area with a plume extending to the right. The plume is divided into several zones: a central core, a mixing zone, and an entrance zone. Arrows indicate the direction of groundwater flow from the source towards the right.

3. Groundwater Dispersion ?

Model: GW Ingestion: Soil Leaching to GW:

	Off site 1	Off site 2	Off site 1	Off site 2	
Distance to GW receptors	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	(ft)
or <input type="text" value="NA"/> <input type="button" value="↓ or ↓"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Longitudinal dispersivity	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	(ft)
Transverse dispersivity	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	(ft)
Vertical dispersivity	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	(ft)

4. Groundwater Discharge to Surface Water ?

Distance to GW/SW discharge point (ft) Wells?

Plume width at GW/SW discharge (ft)

Plume thickness at GW/SW discharge (ft)

Surface water flowrate at GW/SW discharge (ft³/s)

5. Commands and Options

Main Screen

Use Default Values

Print Sheet

Set Units

Help

Site-Specific Air Parameters

Site Name: Former Chevron SS No. 9-0019 Job ID: DG90019G.3C01
 Location: 210 Grand Ave. Oakland, CA Date: 6-May-02
 Compl. By: J. Douglas

1. Outdoor Air Pathway

Dispersion in Air

Distance to onsite air receptor or **NA**

Off-site 1 Off-site 2 (ft) ?

Horizontal dispersivity (ft)

Vertical dispersivity (ft)

Air Source Zone

Air mixing zone height **6.56167979** (ft)

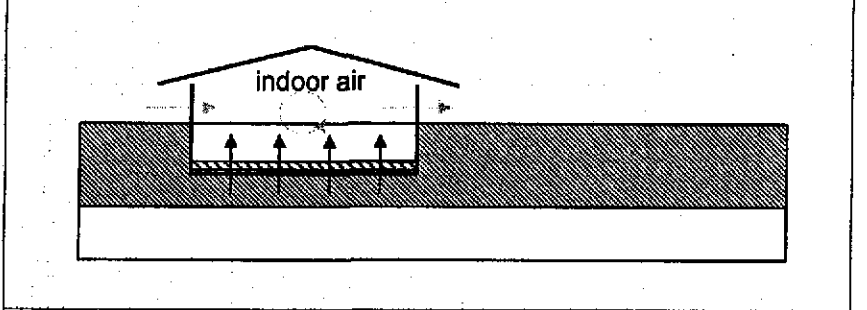
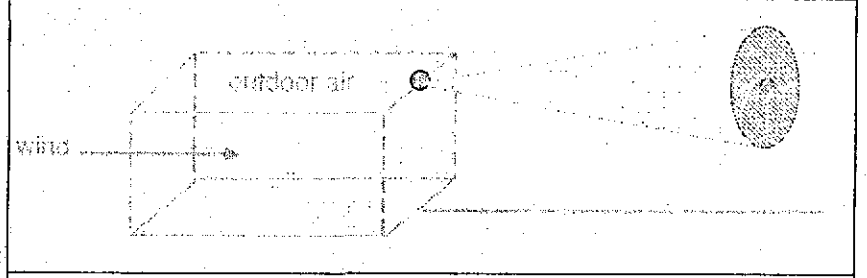
Ambient air velocity in mixing zone **7.381889764** (ft/s)

Areal particulate emission flux **6.9E-14** (g/cm²/s)

2. Indoor Air Pathway

Building Parameters

	Residential	Commercial	
Building volume/area ratio	6.56168	0.04202	(ft)
Foundation area	753.474	753.474	(ft ²)
Foundation perimeter	111.549	111.549	(ft)
Building air exchange rate	1.4E-4	2.3E-4	(1/s)
Depth to bottom of foundation slab	0.49213	0.49213	(ft)
Convective air flow through cracks	0.0E+0	0.0E+0	(ft ³ /s)
Foundation thickness	0.492125984		(ft)
Foundation crack fraction	0.001		(-)
Volumetric water content of cracks	0.12		(-)
Volumetric air content of cracks	0.26		(-)
Indoor/Outdoor differential pressure	0		(g/cm/s ²)



3. Commands and Options

Main Screen **Print Sheet**

Set Units **Use Default Values** **Help**

CHEMICAL DATA FOR SELECTED COCs

Physical Property Data

Constituent	CAS Number	type	Molecular Weight (g/mole)		Diffusion Coefficients				log (Koc) or log(Kd) (@ 20 - 25 C)			Henry's Law Constant (@ 20 - 25 C)		Vapor Pressure (@ 20 - 25 C)		Solubility (@ 20 - 25 C)		acid pKa	base pKb	ref	
			MW	ref	In air (cm ² /s)	ref	In water (cm ² /s)	ref	log(L/Kg) partition	ref	(atm-m ³ /mol)	(unitless)	ref	(mm Hg)	ref	(mg/L)	ref				
Benzene*	71-43-2	A	78.1	PS	8.80E-02	PS	9.80E-06	PS	1.77	Koc	PS	5.55E-03	2.29E-01	PS	9.52E+01	PS	1.75E+03	PS	-	-	-
Toluene	108-88-3	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	Koc	A	6.30E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29	-	-	-
Ethylbenzene	100-41-4	A	106.2	PS	7.50E-02	PS	7.80E-06	PS	2.56	Koc	PS	7.88E-03	3.25E-01	PS	1.00E+01	PS	1.69E+02	PS	-	-	-
Xylene (mixed isomers)	1330-20-7	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	Koc	A	7.03E-03	2.90E-01	A	7.00E+00	4	1.96E+02	5	-	-	-
Methyl t-Butyl ether	1634-04-4	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	Koc	A	5.77E-04	2.38E-02	-	2.49E+02	-	4.80E+04	A	-	-	-
TPH - Arom >C08-C10	0-00-0	T	120	T	1.00E-01	T	1.00E-05	T	3.20	Koc	T	1.16E-02	4.80E-01	T	4.79E+00	-	6.50E+01	T	-	-	-

* = Chemical with user-specified data

Site Name: Former Chevron SS No. 9-0019

Completed By: J. Douglas

Job ID: DG90019G.3C01

Site Location: 210 Grand Ave. Oakland, CA

Date Completed: 6-May-02

CHEMICAL DATA FOR SELECTED COCs

Toxicity Data

Constituent	Reference Dose (mg/kg/day)				Reference Conc. (mg/m3)			Slope Factors 1/(mg/kg/day)				Unit Risk Factor 1/(µg/m3)		EPA Weight of Evidence	Is Constituent Carcinogenic ?
	Oral		Dermal		Inhalation			Oral		Dermal		Inhalation			
	RfD_oral	ref	RfD_dermal	ref	RfC_Inhal	ref	SF_oral	ref	SF_dermal	ref	URF_Inhal	ref			
Benzene*	3.00E-03	R	-	-	5.95E-03	R	1.00E-01	PS	2.99E-02	TX	8.29E-06	PS	A	TRUE	
Toluene	2.00E-01	A,R	1.60E-01	TX	4.00E-01	A,R	-	-	-	-	-	-	D	FALSE	
Ethylbenzene	1.00E-01	PS	9.70E-02	TX	1.00E+00	PS	-	-	-	-	-	-	D	FALSE	
Xylenes (mixed isomers)	2.00E+00	A,R	1.84E+00	TX	7.00E+00	A	-	-	-	-	-	-	D	FALSE	
Methyl t-Butyl ether	1.00E-02	31	8.00E-03	TX	3.00E+00	R	-	-	-	-	-	-	-	FALSE	
TPH - Arom >C08-C10	4.00E-02	T	-	-	2.00E-01	T	-	-	-	-	-	-	D	FALSE	

* = Chemical with user-specific

Site Name: Former Chevron SS

Site Location: 210 Grand Ave

Miscellaneous Chemical Data

Constituent	Maximum Contaminant Level		Time-Weighted Average Workplace Criteria		Aquatic Life Prot. Criteria		Bioconcentration Factor (L-wat/kg-fish)
	MCL (mg/L)	ref	TWA (mg/m3)	ref	AQL (mg/L)	ref	
Benzene*	5.00E-04	-	3.25E+00	-	-	-	12.6
Toluene	1.00E+00	56 FR 3528 (30 Jan 91)	1.47E+02	ACGIH	-	-	70
Ethylbenzene	7.00E-01	56 FR 3528 (30 Jan 91)	4.35E+02	PS	-	-	1
Xylene (mixed isomers)	1.00E+01	56 FR 3528 (30 Jan 91)	4.34E+02	ACGIH	-	-	1
Methyl t-Butyl ether	-	-	6.00E+01	NIOSH	-	-	1
TPH - Arom >C08-C10	-	-	-	-	-	-	1

* = Chemical with user-specific

Site Name: Former Chevron SS

Site Location: 210 Grand Ave

CHEMICAL DATA FOR SELECTED COCs **Miscellaneous Chemical Data**

Constituent	Water Dermal Permeability Data							Detection Limits				Half Life (First-Order Decay) (days)		
	Dermal Relative Absorp. Factor (unitless)	Dermal Permeability Coeff. (cm/hr)	Lag time for Dermal Exposure (hr)	Critical Exposure Time (hr)	Relative Contr of Derm Perm Coeff (unitless)	Water/Skin Derm Adsorp Factor (cm/event)	ref	Groundwater (mg/L)	ref	Soli (mg/kg)	ref	Saturated	Unsaturated	ref
	Benzene*	0.5	0.021	0.26	0.63	0.013	7.3E-2	D	0.002	S	0.005	S	720	720
Toluene	0.5	0.045	0.32	0.77	0.054	1.6E-1	D	0.002	S	0.005	S	28	28	H
Ethylbenzene	0.5	0.074	0.39	1.3	0.14	2.7E-1	D	0.002	S	0.005	S	228	228	H
Xylene (mixed isomers)	0.5	0.08	0.39	1.4	0.16	2.9E-1	D	0.005	S	0.005	S	360	360	H
Methyl t-Butyl ether	0.5	-	-	-	-	-	-	-	-	-	-	360	180	H
TPH - Arom >C08-C10	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-

* = Chemical with user-specific

Site Name: Former Chevron SS

Site Location: 210 Grand Ave

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS:
VAPOR AND DUST INHALATION

Constituents of Concern	1) Source Medium	2) NAF Value (m ³ /kg) Receptor				3) Exposure Medium Outdoor Air: POE Conc. (mg/m ³) (1) / (2)			
	Soil Conc. (mg/kg)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	Construction Worker	None	None	Residential	Construction Worker	None	None
Benzene*	2.4E+0								
Toluene	8.5E+0								
Ethylbenzene	5.1E+0								
Xylene (mixed isomers)	1.9E+1								
Methyl t-Butyl ether	1.3E-3								
TPH - Arom >C08-C10	2.3E+2								

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 9-0019
Site Location: 210 Grand Ave. Oakland, CA
Completed By: J. Douglas

Date Completed: 6-May-02
Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

SURFACE SOILS:

VAPOR AND DUST INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)				5) Average Inhalation Exposure Concentration (mg/m ³) (3) X (4)			
	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	Construction Worker	None	None	Residential	Construction Worker	None	None
Benzene*								
Toluene								
Ethylbenzene								
Xylene (mixed isomers)								
Methyl t-Butyl ether								
TPH - Arom >C08-C10								

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former Chevron SS No. 9-0019

Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas

Date Completed: 6-May-02

Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS (5 - 7 ft):

VAPOR INHALATION

Constituents of Concern	1) Source Medium	2) NAF Value (m ³ /kg) Receptor			3) Exposure Medium Outdoor Air: POE Conc. (mg/m ³) (1) / (2)		
	Soil Conc. (mg/kg)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	None	None	Residential	None	None
Benzene*	2.4E+0	1.3E+5			1.8E-5		
Toluene	8.5E+0	1.3E+5			6.3E-5		
Ethylbenzene	5.1E+0	1.3E+5			3.8E-5		
Xylene (mixed isomers)	1.9E+1	1.3E+5			1.4E-4		
Methyl t-Butyl ether	1.3E-3	1.3E+5			9.3E-9		
TPH - Arom >C08-C10	2.3E+2	1.3E+5			1.7E-3		

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

SUBSURFACE SOILS (5 - 7 ft):
 VAPOR INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)			5) Average Inhalation Exposure Concentration (mg/m ³) (3) X (4)		
	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	None	None	Residential	None	None
Benzene*	4.1E-1			7.3E-6		
Toluene	9.6E-1			6.1E-5		
Ethylbenzene	9.6E-1			3.6E-5		
Xylene (mixed isomers)	9.6E-1			1.3E-4		
Methyl t-Butyl ether	9.6E-1			8.9E-9		
TPH - Arom >C08-C10	9.6E-1			1.7E-3		

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR
INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium	2) NAF Value (m ³ /L) Receptor			3) Exposure Medium Outdoor Air: POE Conc. (mg/m ³) (1) / (2)		
	Groundwater Conc. (mg/L)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	None	None	Residential	None	None
Benzene*	3.7E-1	5.6E+4			6.6E-6		
Toluene	8.7E-1	5.4E+4			1.6E-5		
Ethylbenzene	2.0E-1	5.4E+4			3.8E-6		
Xylene (mixed isomers)	6.0E-1	5.8E+4			1.0E-5		
Methyl t-Butyl ether	1.0E-1	4.6E+4			2.2E-6		
TPH - Arom >C08-C10	6.4E+0	3.1E+4			2.1E-4		

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 9-0019
Site Location: 210 Grand Ave. Oakland, CA
Completed By: J. Douglas

Date Completed: 6-May-02
Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

GROUNDWATER: VAPOR
 INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EF×ED)/(AT×365) (unitless)			5) Average Inhalation Exposure Concentration (mg/m ³) (3) X (4)		
	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	None	None	Residential	None	None
Benzene*	4.1E-1			2.7E-6		
Toluene	9.6E-1			1.5E-5		
Ethylbenzene	9.6E-1			3.6E-6		
Xylene (mixed isomers)	9.6E-1			9.9E-6		
Methyl t-Butyl ether	9.6E-1			2.1E-6		
TPH - Arom >C08-C10	9.6E-1			2.0E-4		

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

7 OF 7

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

TOTAL PATHWAY EXPOSURE (mg/m³)
 (Sum average exposure concentrations
 from soil and groundwater routes.)

Constituents of Concern	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	Construction Worker	None	None
Benzene*	1.0E-5			
Toluene	7.6E-5			
Ethylbenzene	4.0E-5			
Xylene (mixed isomers)	1.4E-4			
Methyl t-Butyl ether	2.2E-6			
TPH - Arom >C08-C10	1.9E-3			

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Exposure (mg/m ³)				(3) Inhalation Unit Risk Factor (μg/m ³) ⁻¹	(4) Individual COC Risk (2) x (3) x 1000			
		On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)		On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	Construction Worker	None	None		Residential	Construction Worker	None	None
Benzene*	A	1.0E-5				8.3E-6	8.3E-8			
Toluene	D									
Ethylbenzene	D									
Xylene (mixed isomers)	D									
Methyl t-Butyl ether	-									
TPH - Arom >C08-C10	D									

Total Pathway Carcinogenic Risk =

8.3E-8

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

TOXIC EFFECTS

Constituents of Concern	(5) Total Toxicant Exposure (mg/m ³)				(6) Inhalation Reference Conc. (mg/m ³)	(7) Individual COC Hazard Quotient (5) / (6)			
	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)		On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	Construction Worker	None	None		Residential	Construction Worker	None	None
Benzene*	2.3E-5				6.0E-3	3.9E-3			
Toluene	7.6E-5				4.0E-1	1.9E-4			
Ethylbenzene	4.0E-5				1.0E+0	4.0E-5			
Xylene (mixed isomers)	1.4E-4				7.0E+0	2.1E-5			
Methyl t-Butyl ether	2.2E-6				3.0E+0	7.2E-7			
TPH - Arom >C08-C10	1.9E-3				2.0E-1	9.3E-3			

Total Pathway Hazard Index = 1.4E-2

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SOILS (5 - 7 ft): VAPOR

INTRUSION INTO ON-SITE BUILDINGS

Constituents of Concern	1) Source Medium	2) NAF Value (m ³ /kg) Receptor	3) Exposure Medium Indoor Air: POE Conc. (mg/m ³) (1) / (2)	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)	5) Average Inhalation Exposure Concentration (mg/m ³) (3) X (4)
	Soil Conc. (mg/kg)	Residential	Residential	Residential	Residential
Benzene*	2.4E+0	1.6E+3	1.5E-3	4.1E-1	6.1E-4
Toluene	8.5E+0	3.3E+3	2.6E-3	9.6E-1	2.5E-3
Ethylbenzene	5.1E+0	8.1E+3	6.3E-4	9.6E-1	6.0E-4
Xylene (mixed isomers)	1.9E+1	6.3E+3	3.0E-3	9.6E-1	2.9E-3
Methyl t-Butyl ether	1.3E-3	3.7E+3	3.4E-7	9.6E-1	3.3E-7
TPH - Arom >C08-C10	2.3E+2	1.8E+4	1.3E-2	9.6E-1	1.3E-2

* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INTRUSION
INTO ON-SITE BUILDINGS

Exposure Concentration

Constituents of Concern	1) Source Medium	2) NAF Value (m ³ /L) Receptor	3) Exposure Medium Indoor Air: POE Conc. (mg/m ³) (1) / (2)	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)	5) Average Inhalation Exposure Concentration (mg/m ³) (3) X (4)
	Groundwater Conc. (mg/L)	Residential	Residential	Residential	Residential
Benzene*	3.7E-1	3.2E+2	1.2E-3	4.1E-1	4.7E-4
Toluene	8.7E-1	2.9E+2	2.9E-3	9.6E-1	2.8E-3
Ethylbenzene	2.0E-1	2.7E+2	7.5E-4	9.6E-1	7.2E-4
Xylene (mixed isomers)	6.0E-1	3.1E+2	1.9E-3	9.6E-1	1.8E-3
Methyl t-Butyl ether	1.0E-1	2.9E+3	3.6E-5	9.6E-1	3.4E-5
TPH - Arom >C08-C10	6.4E+0	1.4E+2	4.5E-2	9.6E-1	4.3E-2

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure
 Site Name: Former Chevron SS No. 9-0019 Date Completed: 6-May-02
 Site Location: 210 Grand Ave. Oakland, CA Job ID: DG90019G.3C01
 Completed By: J. Douglas

RBCA SITE ASSESSMENT

3 OF 3

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

TOTAL PATHWAY EXPOSURE (mg/m³)
*(Sum average exposure concentrations
 from soil and groundwater routes.)*

Constituents of Concern	Residential
Benzene*	1.1E-3
Toluene	5.3E-3
Ethylbenzene	1.3E-3
Xylene (mixed isomers)	4.7E-3
Methyl t-Butyl ether	3.5E-5
TPH - Arom >C08-C10	5.6E-2

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

3 OF 10

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAYS ARE ACTIVE)

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Exposure (mg/m ³) Residential	(3) Inhalation Unit Risk Factor (µg/m ³) ⁻¹	(4) Individual COC Risk (2) x (3) x 1000 Residential
	Benzene*	A	1.1E-3	8.3E-6
Toluene	D			
Ethylbenzene	D			
Xylene (mixed isomers)	D			
Methyl t-Butyl ether	-			
TPH - Arom >C08-C10	D			

Total Pathway Carcinogenic Risk = 9.0E-6

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

4 OF 10

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS (CHECKED IF PATHWAYS ARE ACTIVE)

TOXIC EFFECTS

Constituents of Concern	(5) Total Toxicant Exposure (mg/m ³)	(6) Inhalation Reference Concentration (mg/m ³)	(7) Individual COC Hazard Quotient (5) / (6)
	Residential		Residential
Benzene*	2.5E-3	6.0E-3	4.2E-1
Toluene	5.3E-3	4.0E-1	1.3E-2
Ethylbenzene	1.3E-3	1.0E+0	1.3E-3
Xylene (mixed isomers)	4.7E-3	7.0E+0	6.7E-4
Methyl t-Butyl ether	3.5E-5	3.0E+0	1.2E-5
TPH - Arom >C08-C10	5.6E-2	2.0E-1	2.8E-1

Total Pathway Hazard Index = 7.2E-1

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

Site Name: Former Chevron SS No. 9-0019 Site Location: 210 Grand Ave. Oakland, C. Completed By: J. Douglas Date Completed: 6-May-02 1 OF 1

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAY (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS:

**ON-SITE INGESTION AND
DERMAL CONTACT**

Constituents of Concern	1) Source/Exposure Medium	2) Exposure Multiplier (IR+SAxMxRAF)xEFxED/(BWxAT) (kg/kg/day)		3) Average Daily Intake Rate (mg/kg/day) (1) x (2)	
	Surface Soil Conc. (mg/kg)	Residential	Construction Worker	Residential	Construction Worker
Benzene*	2.4E+0	1.8E-5		4.2E-5	
Toluene	8.5E+0	4.1E-5		3.5E-4	
Ethylbenzene	5.1E+0	4.1E-5		2.1E-4	
Xylene (mixed isomers)	1.9E+1	4.1E-5		7.7E-4	
Methyl t-Butyl ether	1.3E-3	4.1E-5		5.1E-8	
TPH - Arom >C08-C10	2.3E+2	4.1E-5		9.6E-3	

NOTE: RAF = Relative absorption factor (-) AT = Averaging time (days) ED = Exposure duration (yrs) IR = Soil ingestion rate (mg/day)
M = Adherence factor (mg/cm²) BW = Body weight (kg) EF = Exposure frequency (days/yr) SA = Skin exposure area (cm²/day)

Site Name: Former Chevron SS No. 9-0019
Site Location: 210 Grand Ave. Oakland, CA
Completed By: J. Douglas

Date Completed: 6-May-02
Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAY

(CHECKED IF PATHWAY IS ACTIVE)

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)				(3) Slope Factor (mg/kg/day) ⁻¹		(4) Individual COC Risk	
		(a) via Ingestion		(b) via Dermal Contact		(a) Oral	(b) Dermal	(2a)x(3a) + (2b)x(3b)	
		Residential		Construction Worker				Residential	Construction Worker
Benzene*	A	1.4E-6	4.1E-5			1.0E-1	3.0E-2	1.4E-6	
Toluene	D								
Ethylbenzene	D								
Xylene (mixed isomers)	D								
Methyl t-Butyl ether	-								
TPH - Arom >C08-C10	D								

* No dermal slope factor available--oral slope factor used.

Total Pathway Carcinogenic Risk = **1.4E-6**

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAY

(CHECKED IF PATHWAY IS ACTIVE)

TOXIC EFFECTS

Constituents of Concern	(5) Total Toxicant Intake Rate (mg/kg/day)				(6) Oral		(7) Individual COC Hazard Quotient	
	(a) via Ingestion	(b) via Dermal Contact	(c) via Ingestion	(d) via Dermal Contact	Reference Dose (mg/kg-day)		(5a)/(6a) + (5b)/(6b)	(5c)/(6a) + (5d)/(6b)
	Residential		Construction Worker		(a) Oral	(b) Dermal	Residential	Construction Worker
Benzene*	3.3E-6	9.5E-5			3.0E-3	3.0E-3*	3.3E-2	
Toluene	1.2E-5	3.4E-4			2.0E-1	1.6E-1	2.2E-3	
Ethylbenzene	7.0E-6	2.0E-4			1.0E-1	9.7E-2	2.2E-3	
Xylene (mixed isomers)	2.6E-5	7.5E-4			2.0E+0	1.8E+0	4.2E-4	
Methyl t-Butyl ether	1.7E-9	5.0E-8			1.0E-2	8.0E-3	6.4E-6	
TPH - Arom >C08-C10	3.2E-4	9.3E-3			4.0E-2	4.0E-2*	2.4E-1	

* No dermal reference dose available—oral reference dose used.

Total Pathway Hazard Index =

2.8E-1

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA
 Completed By: J. Douglas

Date Completed: 6-May-02
 Job ID: DG90019G.3C01

RBCA SITE ASSESSMENT

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave., Oakland, CA

Completed By: J. Douglas
 Date Completed: 9-May-02

Job ID: DG90019G.3C01

SOIL (5 - 7 ft) SSTL VALUES

Target Risk (Class A & B) 1.0E-5
 Target Risk (Class C) 1.0E-5
 Target Hazard Quotient 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" if Complete)

CAS No.	Name	Representative Concentration (mg/kg)	Soil Leaching to Groundwater Ingestion / Discharge to Surface Water			X	Soil Vol. to Indoor Air	X	Soil Volatilization and Surface Soil Particulates to Outdoor Air			X	Surface Soil Inhalation, Ingestion, Dermal Contact		Applicable SSTL (mg/kg)	SSTL Exceeded? * if yes	Required CRF Only if "yes" left
			On-site (0 ft)	Off-site 1 (ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)	Off-site 1 (ft)	Off-site 2 (0 ft)	On-site (0 ft)	On-site (0 ft)	On-site (0 ft)					
			None	None	None	Residential	Residential	Construction Worker	None	None	Residential	Construction Worker					
71-43-2	Benzene*	2.4E+0	NA	NA	NA	4.7E+0	X	4.0E+2	NA	NA	NA	1.8E+1	NA	4.7E+0	<input type="checkbox"/>	<1	
108-88-3	Toluene	8.5E+0	NA	NA	NA	1.4E+3	X	>7.0E+3	NA	NA	NA	3.9E+3	NA	1.4E+3	<input type="checkbox"/>	<1	
100-41-4	Ethylbenzene	5.1E+0	NA	NA	NA	>6.2E+3	X	>6.2E+3	NA	NA	NA	2.4E+3	NA	2.4E+3	<input type="checkbox"/>	<1	
1330-20-7	Xylene (mixed isomers)	1.9E+1	NA	NA	NA	>4.8E+3	X	>4.8E+3	NA	NA	NA	4.5E+4	NA	4.5E+4	<input type="checkbox"/>	<1	
1834-04-4	Methyl t-Butyl ether	1.3E-3	NA	NA	NA	1.1E+4	X	>6.1E+4	NA	NA	NA	2.0E+2	NA	2.0E+2	<input type="checkbox"/>	<1	
0-00-0	TPH - Arom >C08-C10	2.3E+2	NA	NA	NA	3.7E+3	X	>1.0E+4	NA	NA	NA	9.7E+2	NA	9.7E+2	<input type="checkbox"/>	<1	

* = Chemical with user-specified data

>3 indicates risk-based target concentration greater than constituent residual saturation value. NA = Not applicable. NC = Not calculated.

RBCA SITE ASSESSMENT

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

Job ID: DG90019G.3C01

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-5
 Target Risk (Class C) 1.0E-5
 Target Hazard Quotient 1.0E+0

Groundwater DAF Option:

SSTL Results For Complete Exposure Pathways ("X" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/L)	Groundwater Ingestion / Discharge to Surface Water			X	GW Vol. to Indoor Air	X	Groundwater Volatilization to Outdoor Air			Applicable SSTL (mg/L)	SSTL Exceeded? "■" if yes	Required CRF Only if "yes" /gft
			On-site (0 ft) None	Off-site 1 (0 ft) None	Off-site 2 (0 ft) None	On-site (0 ft) Residential	On-site (0 ft) Residential	Off-site 1 (0 ft) None	Off-site 2 (0 ft) None					
71-43-2	Benzene*	3.7E-1	NA	NA	NA		9.4E-1		1.7E+2	NA	NA	9.4E-1	<input type="checkbox"/>	<1
108-88-3	Toluene	8.7E-1	NA	NA	NA		1.2E+2		>5.2E+2	NA	NA	1.2E+2	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	2.0E-1	NA	NA	NA		>1.7E+2		>1.7E+2	NA	NA	>1.7E+2	<input type="checkbox"/>	NA
1330-20-7	Xylene (mixed isomers)	6.0E-1	NA	NA	NA		>2.0E+2		>2.0E+2	NA	NA	>2.0E+2	<input type="checkbox"/>	NA
1634-04-4	Methyl t-Butyl ether	1.0E-1	NA	NA	NA		9.0E+3		>4.8E+4	NA	NA	9.0E+3	<input type="checkbox"/>	<1
0-00-0	TPH - Arom >C08-C10	6.4E+0	NA	NA	NA		2.9E+1		>6.5E+1	NA	NA	2.9E+1	<input type="checkbox"/>	<1

* = Chemical with user-specified data

">" Indicates risk-based target concentration greater than constituent solubility value.

NA = Not applicable.

NC = Not calculated.

RBCA SITE ASSESSMENT

TPH Criteria SSTL Worksheet

Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave, Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

Job ID: DG90019G.3C01

1 OF 1

CALCULATION OF SSTL VALUES FOR TPH

CONSTITUENTS OF CONCERN		Mass Fractions		Representative Concentrations		Calculated Concentration Limits		Applicable SSTL Values	
		Soil	Groundwater	Soil	Groundwater	Residual Soil Concentration	Solubility	Soils (5 - 7 ft)	Groundwater
CAS No.	Name	(-)	(-)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)
0-00-0	TPH - Arom >C08-C10	1.0E+0	1.0E+0	2.3E+2	6.4E+0	1.0E+4	6.5E+1	9.7E+2	2.9E+1
* = Chemical with user-specified data									
Total		1.0E+0	1.0E+0	2.3E+2	6.4E+0	Total TPH SSTL value		9.7E+2	2.9E+1

">" indicates risk-based target concentration greater than constituent residual saturation value. NC = Not calculated.

RBCA SITE ASSESSMENT	Cumulative Risk Worksheet
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Site Name: Former Chevron SS No. 9-0019
 Site Location: 210 Grand Ave. Oakland, CA

Completed By: J. Douglas
 Date Completed: 6-May-02

Job ID: DG90019G.3C01

1 OF 3

CUMULATIVE RISK WORKSHEET

CONSTITUENTS OF CONCERN		Representative Concentration		Proposed CRF		Resultant Target Concentration	
		Soil (mg/kg)	Groundwater (mg/L)	Soil	GW	Soil (mg/kg)	Groundwater (mg/L)
71-43-2	Benzene*	2.4E+0	3.7E-1			2.4E+0	3.7E-1
108-88-3	Toluene	8.5E+0	8.7E-1			8.5E+0	8.7E-1
100-41-4	Ethylbenzene	5.1E+0	2.0E-1			5.1E+0	2.0E-1
1330-20-7	Xylene (mixed isomers)	1.9E+1	6.0E-1			1.9E+1	6.0E-1
1634-04-4	Methyl t-Butyl ether	1.3E-3	1.0E-1			1.3E-3	1.0E-1
0-00-0	TPH - Arom >C08-C10	2.3E+2	6.4E+0			2.3E+2	6.4E+0

Cumulative Values:

RBCA SITE ASSESSMENT **Cumulative Risk Worksheet**

Site Name: Former Chevron SS No. 9-0019 Site Name: Former Chevron SS No. 9-0019 Completed By: J. Douglas Job ID: DG90019G.3C01
 Site Location: 210 Grand Ave. Oakland, CA Site Location: 210 Grand Ave. Oakland, CA Date Completed: 6-May-02 **2 OF 3**

CUMULATIVE RISK WORKSHEET Cumulative Target Risk: 1.0E-5 Target Hazard Index: 1.0E+0

ON-SITE RECEPTORS

CONSTITUENTS OF CONCERN		Outdoor Air Exposure:		Indoor Air Exposure:		Soil Exposure:		Groundwater Exposure:	
		Residential		Residential		Residential		None	
		Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0	Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0	Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0	Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0
CAS No.	Name	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient
71-43-2	Benzene*	8.3E-8	3.9E-3	9.0E-6	4.2E-1	1.4E-6	3.3E-2		
108-88-3	Toluene		1.9E-4		1.3E-2		2.2E-3		
100-41-4	Ethylbenzene		4.0E-5		1.3E-3		2.2E-3		
1330-20-7	Xylene (mixed isomers)		2.1E-5		6.7E-4		4.2E-4		
1634-04-4	Methyl t-Butyl ether		7.2E-7		1.2E-5		6.4E-6		
0-00-0	TPH - Arom >C08-C10		9.3E-3		2.8E-1		2.4E-1		
Cumulative Values:		8.3E-8	1.4E-2	9.0E-6	7.2E-1	1.4E-6	2.8E-1	0.0E+0	0.0E+0

■ indicates risk level exceeding target risk

RBCA SITE ASSESSMENT	Cumulative Risk Worksheet
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Site Name: Former Chevron SS No. 9-0019	Site Name: Former Chevron SS No. 9-0019	Completed By: J. Douglas	Job ID: DG90019G.3C01
Site Location: 210 Grand Ave. Oakland, CA	Site Location: 210 Grand Ave. Oakland, CA	Date Completed: 6-May-02	3 OF 3

CUMULATIVE RISK WORKSHEET	Cumulative Target Risk: 1.0E-5 Target Hazard Index: 1.0E+0								
OFF-SITE RECEPTORS									
CONSTITUENTS OF CONCERN		Outdoor Air Exposure:				Groundwater Exposure:			
		None		None		None		None	
		Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0	Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0	Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0	Target Risk: 1.0E-5 / 1.0E-5	Target HQ: 1.0E+0
CAS No.	Name	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient	Carcinogenic Risk	Hazard Quotient
71-43-2	Benzene*								
108-88-3	Toluene								
100-41-4	Ethylbenzene								
1330-20-7	Xylene (mixed isomers)								
1634-04-4	Methyl t-Butyl ether								
0-00-0	TPH - Arom >C08-C10								
Cumulative Values:		0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

■ Indicates risk level exceeding target risk