

ENVIRONMENTAL
PROTECTION
00 DEC -8 PM 4: 13

November 30, 2000

Ms. Eva Chu
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: Good Chevrolet, 1630 Park Street, Alameda, CA

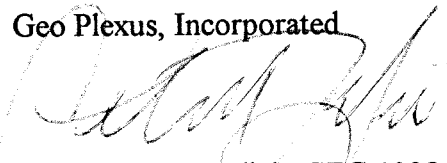
Dear Ms. Chu:

Please find attached copies of the RBCA Tier-1 analyses for the three risk levels evaluated (10-4, 10-5, and 10-6) which were performed for the previous risk assessment along with tabulated and graphical evaluations of the ground water elevation fluctuations for the monitoring wells.

I trust that this will assist you in your evaluation for site closure. Feel free to call if you have additional questions.

Respectfully submitted,

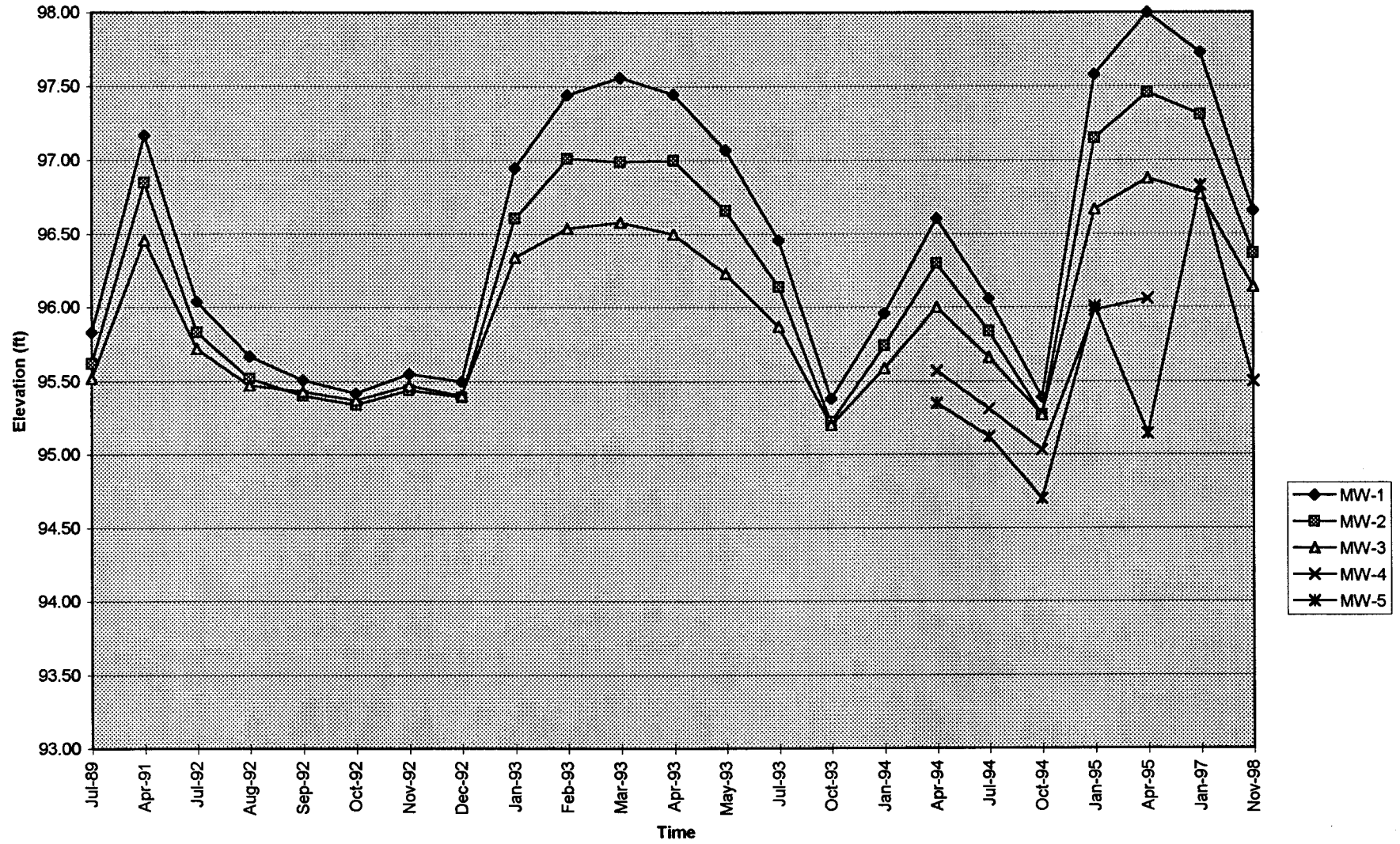
Geo Plexus, Incorporated



Cathrene Diane Glick, CEG 1338, HG 32
Director, Geologic and Environmental Services

Good Chevrolet Ground Water Data												
	Jul-89	Apr-91	Jul-92	Aug-92	Sep-92	Oct-92	Nov-92	Dec-92	Jan-93	Feb-93	Mar-93	Apr-93
DEPTH												
MW-1	-8.93	-7.59	-8.72	-9.09	-9.25	-9.34	-9.21	-9.26	-7.81	-7.32	-7.20	-7.31
MW-2	-9.24	-8.01	-9.03	-9.34	-9.46	-9.52	-9.42	-9.47	-8.25	-7.85	-7.77	-7.86
MW-3	-9.00	-8.06	-8.82	-9.05	-9.09	-9.15	-9.05	-9.12	-8.18	-7.98	-7.94	-8.02
MW-4												
MW-5												
ELEVATION												
MW-1	95.83	97.17	96.04	95.67	95.51	95.42	95.55	95.50	96.95	97.44	97.56	97.45
MW-2	95.62	96.85	95.83	95.52	95.40	95.34	95.44	95.39	96.61	97.01	96.99	97.00
MW-3	95.52	96.46	95.72	95.47	95.43	95.37	95.47	95.40	96.34	96.54	96.58	96.50
MW-4												
MW-5												
	May-93	Jul-93	Oct-93	Jan-94	Apr-94	Jul-94	Oct-94	Jan-95	Apr-95	Jan-97	Nov-98	
DEPTH												
MW-1	-8.29	-8.30	-9.38	-8.80	-8.15	-8.70	-9.37	-7.18	-6.76	-7.03	-8.10	
MW-2	-8.20	-8.72	-9.64	-9.12	-8.56	-9.02	-9.59	-7.71	-7.40	-7.55	-8.49	
MW-3	-7.69	-8.65	-9.32	-8.93	-8.52	-8.86	-9.25	-7.85	-7.64	-7.75	-8.38	
MW-4					-9.29	-9.55	-9.83	-8.88	-8.80	-----	----	
MW-5					-8.27	-8.50	-8.92	-7.61	-8.48	-6.79	-8.12	
ELEVATION	May-93	Jul-93	Oct-93	Jan-94	Apr-94	Jul-94	Oct-94	Jan-95	Apr-95	Jan-97	Nov-98	
MW-1	97.07	96.46	95.38	95.96	96.61	96.06	95.39	97.58	98.00	97.73	96.66	
MW-2	96.66	96.14	95.22	95.74	96.30	95.84	95.27	97.15	97.46	97.31	96.37	
MW-3	96.23	95.87	95.20	95.59	96.00	95.66	95.27	96.67	96.88	96.77	96.14	
MW-4						95.57	95.31	95.03	95.98	96.06		
MW-5						95.35	95.12	94.70	96.01	95.14	96.83	95.50

Good Chevrolet Ground Water Elevations



RISK
1x10⁻⁴

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Good Chevrolet Job Identification:
 Site Location: 1630 Park Street, Alameda, CA Date Completed: 12/10/98
 Completed By: Cathrene Glick

Software: GSI RBCA Spreadsheet
 Version: v 1.0

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

DEFAULT PARAMETERS

		Residential			Commercial/Industrial	
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Constrctn
1s (yr)		70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (l/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg·yr/kg·d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m ³ /day)	15			20	
IRa.out	Inhalation rate outdoor (m ³ /day)	20			20	10
SA	Skin surface area (dermal) (cm ²)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² ·yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	<u>TRUE</u>			<u>TRUE</u>	
AAFd	Age adjustment on skin surface area	<u>TRUE</u>			<u>TRUE</u>	
tox	Use EPA tox data for air (or PEL based)	<u>TRUE</u>				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential		Commercial/Industrial	
		Chronic	Constrctn	Chronic	Constrctn
Groundwater Pathways:					
GW.i	Groundwater Ingestion	TRUE		TRUE	
GW.v	Volatilization to Outdoor Air	FALSE		TRUE	
GW.b	Vapor Intrusion to Buildings	FALSE		TRUE	
Soil Pathways					
S.v	Volatiles from Subsurface Soils	TRUE		TRUE	
SS.v	Volatiles and Particulate Inhalation	TRUE		TRUE	TRUE
SS.d	Direct Ingestion and Dermal Contact	FALSE		TRUE	TRUE
S.l	Leaching to Groundwater from all Soils	TRUE		TRUE	
S.b	Intrusion to Buildings - Subsurface Soils	FALSE		TRUE	

Matrix of Receptor Distance and Location on- or off-site		Residential		Commercial/Industrial	
		Distance	On-Site	Distance	On-Site
GW	Groundwater receptor (cm)	4.6E+04	FALSE		TRUE
S	Inhalation receptor (cm)	4.6E+04	FALSE		TRUE

Matrix of Target Risks		Residential	
		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	<u>1.0E-04</u>	1.0E-04
TRc	Target Risk (class C carcinogens)	<u>1.0E-04</u>	
THQ	Target Hazard Quotient	1.0E+00	1.0E+00
Opt	Calculation Option (1, 2, or 3)	3	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Commercial/Industrial		
		Residential	Chronic	Construction
t	Exposure duration (yr)	30		1
A	Contaminated soil area (cm ²)	<u>6.5E+06</u>	25	<u>9.3E+05</u>
W	Length of affected soil parallel to wind (cm)	<u>2.4E+03</u>		<u>1.5E+03</u>
W.gw	Length of affected soil parallel to groundwater (cm)	<u>3.0E+03</u>		
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02		
delta	Air mixing zone height (cm)	2.0E+02		
Lss	Definition of surficial soils (cm)	<u>9.1E+01</u>		
Pe	Particulate areal emission rate (g/cm ² /s)	2.2E-10		

Groundwater Parameters	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	<u>2.6E+02</u>
I	Groundwater infiltration rate (cm/yr)	<u>1.5E+01</u>
Ugw	Groundwater Darcy velocity (cm/yr)	<u>1.5E+03</u>
Ugw.tr	Groundwater Transport velocity (cm/yr)	6.6E+03
Ks	Saturated Hydraulic Conductivity (cm/s)	
grad	Groundwater Gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
BC	Biodegradation Capacity (mg/L)	
BIO?	Is Bioattenuation Considered	TRUE
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03

Soil Parameters	Definition (Units)	Value
hc	Capillary zone thickness (cm)	<u>4.6E+00</u>
hv	Vadose zone thickness (cm)	<u>2.4E+02</u>
rho	Soil density (g/cm ³)	1.7
foc	Fraction of organic carbon in vadose zone	0.01
phi	Soil porosity in vadose zone	0.38
Lgw	Depth to groundwater (cm)	<u>2.4E+02</u>
Ls	Depth to top of affected soil (cm)	<u>9.1E+01</u>
Lsubs	Thickness of affected subsurface soils (cm)	<u>3.7E+02</u>
pH	Soil/groundwater pH	6.5
		<u>capillary</u> <u>vadose</u> <u>foundation</u>
phi.w	Volumetric water content	0.342 0.12 0.12
phi.a	Volumetric air content	0.038 0.26 0.26

Building Parameters	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s ⁻¹)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Dispersive Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersion coefficient (cm)		
ay	Transverse dispersion coefficient (cm)		
az	Vertical dispersion coefficient (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

A-1

RBCA CHEMICAL DATABASE

Physical Property Data

Vapor

CAS Number	Constituent	type	Molecular Weight (g/mole) MW ref	Diffusion Coefficients				log (Koc) or log(Kd) (@ 20 - 25 C) (l/kg)		Henry's Law Constant (@ 20 - 25 C) (atm-m ³) (unitless)		Pressure (@ 20 - 25 C) (mm Hg) Pure		Solubility (@ 20 - 25 C) (mg/l) Pure		acid pKa	base pKb	ref
				Dair	re	Dwat	re	Koc	ref	mol	re	Component	ref	Component	ref			
71-43-2	Benzene	A	78.1 5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A		
100-41-4	Ethylbenzene	A	106.2 5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5		
1634-04-4	Methyl t-Butyl Ether	O	88.146 5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A		
108-88-3	Toluene	A	92.4 5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29		
1330-20-7	Xylene (mixed isomers)	A	106.2 5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5		

Site Name: Good Chevrolet

Site Location: 1630 Park Street, AI Completed By: Cathrene Glick

Date Completed: 12/10/1998

Software version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day)				Slope Factors 1/(mg/kg/day)				EPA Weight of Evidence	Is Constituent Carcinogenic ?
		Oral RfD_oral	ref	Inhalation RfD_inhal	re	Oral SF_oral	ref	Inhalation SF_inhal	ref		
71-43-2	Benzene	-	R	1.70E-03	R	2.90E-02	A	2.90E-02	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-	R	-	R	D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-	R	-	R		FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	,	-	R	-	R	D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-	R	-	R	D	FALSE

Site Name: Good Chevrol Site Location: 1630 Park Street, Ala Completed By: Cathrene Glick Date Completed: 12/10/1998

Software version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene	
Ethylbenzene	
Methyl t-Butyl Ether	
Toluene	
Xylene (mixed isomers)	

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	4.5E+0		7.1E-2		8.6E+0	
Ethylbenzene	5.7E-1		2.6E-2		5.1E+1	
Methyl t-Butyl Ether	2.0E-2		1.0E-2		3.1E+0	
Toluene	4.5E-1		5.2E-2		9.0E+1	
Xylene (mixed isomers)	1.0E+0		7.4E-2		2.3E+2	

Site Name: Good Chevrolet
 Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick
 Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene	720
Ethylbenzene	228
Methyl t-Butyl Ether	360
Toluene	28
Xylene (mixed isomers)	360

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

Dilution Attenuation Factor

(DAF) in Groundwater

CONSTITUENT	Residential	Comm./Ind.
	Receptor	Receptor
Benzene	1.0E+0	1.0E+0
Ethylbenzene	1.0E+0	1.0E+0
Methyl t-Butyl Ether	1.0E+0	1.0E+0
Toluene	1.0E+0	1.0E+0
Xylene (mixed isomers)	1.0E+0	1.0E+0

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda, CA

Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m ³)
Benzene		
Ethylbenzene		
Methyl t-Butyl Ether		
Toluene		
Xylene (mixed isomers)		

Site Name: Good Chevrolet
 Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick
 Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda, CA

Date Completed: 12/10/1998

1 OF 1

**SURFACE SOIL SSTL VALUES
(< 3 FT BGS)**

Target Risk (Class A & B) 1.0E-4

MCL exposure limit?

Calculation Option: 3

Target Risk (Class C) 1.0E-4

PEL exposure limit?

Target Hazard Quotient 1.0E+0

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

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Ingestion, Inhalation and Dermal Contact		Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: 1500 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: 1500 feet	Commercial: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	7.1E-2	1.4E+0	4.5E+0	NA	>Res	3.5E+2	>Res	1.4E+0	<input type="checkbox"/>	<1
100-41-4	Ethylbenzene	2.6E-2	3.7E+1	1.0E+2	NA	>Res	>Res	>Res	3.7E+1	<input type="checkbox"/>	<1
1634-04-4	Methyl t-Butyl Ether	1.0E-2	3.4E-1	9.4E-1	NA	>Res	2.0E+2	2.4E+2	3.4E-1	<input type="checkbox"/>	<1
108-88-3	Toluene	5.2E-2	1.0E+2	2.8E+2	NA	>Res	>Res	>Res	1.0E+2	<input type="checkbox"/>	<1
1330-20-7	Xylene (mixed isomers)	7.4E-2	>Res	>Res	NA	>Res	>Res	>Res	>Res	<input type="checkbox"/>	<1

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

Software: GSI RBCA Spreadsheet
Version: v 1.0

Serial: G-265-VHX-686

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda, CA

Date Completed: 12/10/1998

1 OF 1

**SUBSURFACE SOIL SSTL VALUES
(> 3 FT BGS)**

Target Risk (Class A & B) 1.0E-4
Target Risk (Class C) 1.0E-4
Target Hazard Quotient 1.0E+0

MCL exposure limit?
 PEL exposure limit?

Calculation Option: 3

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

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: 1500 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: 1500 feet	Commercial: (on-site)	(mg/kg)	*■* If yes	Only if "yes" left
71-43-2	Benzene	8.6E+0	1.4E+0	4.5E+0	NA	NA	7.6E-1	1.7E+2	2.0E+2	7.6E-1	■	1.1E+01
100-41-4	Ethylbenzene	5.1E+1	3.7E+1	1.0E+2	NA	NA	1.3E+2	>Res	>Res	3.7E+1	■	1.0E+00
1634-04-4	Methyl t-Butyl Ether	3.1E+0	3.4E-1	9.4E-1	NA	NA	6.3E+2	>Res	>Res	3.4E-1	■	9.0E+00
108-88-3	Toluene	9.0E+1	1.0E+2	2.8E+2	NA	NA	5.4E+1	>Res	>Res	5.4E+1	■	2.0E+00
1330-20-7	Xylene (mixed isomers)	2.3E+2	>Res	>Res	NA	NA	>Res	>Res	>Res	>Res	□	<1

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

Software: GSI RBCA Spreadsheet
Version: v 1.0

Serial: G-265-VHX-686

RBCA SITE ASSESSMENT

Site Name: Good Chevrolet
 Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick
 Date Completed: 12/10/1998

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-4
 Target Risk (Class C) 1.0E-4
 Target Hazard Quotient 1.0E+0

MCL exposure limit?
 PEL exposure limit?

Calculation Option: 3

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

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded?	Required CRF
CAS No.	Name	(mg/L)	Residential: 1500 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L)	■* If yes	Only if "yes" left
71-43-2	Benzene	4.5E+0	2.9E-1	9.9E-1	NA	NA	1.2E+0	NA	1.8E+2	2.9E-1	■	1.5E+01
100-41-4	Ethylbenzene	5.7E-1	3.7E+0	1.0E+1	NA	NA	>Sol	NA	>Sol	3.7E+0	□	<1
1634-04-4	Methyl t-Butyl Ether	2.0E-2	1.8E-1	5.1E-1	NA	NA	3.6E+3	NA	>Sol	1.8E-1	□	<1
108-88-3	Toluene	4.5E-1	7.3E+0	2.0E+1	NA	NA	8.0E+1	NA	>Sol	7.3E+0	□	<1
1330-20-7	Xylene (mixed isomers)	1.0E+0	7.3E+1	>Sol	NA	NA	>Sol	NA	>Sol	7.3E+1	□	<1

Site Name: Good Chevrolet

Job Identification:

Site Location: 1630 Park Street, Alameda, Date Completed: 12/10/1998

SUMMARY CALCULATIONS - SSTL BY CUMULATIVE RISK

CAS No.	Constituent	Representative Concentration Groundwater (mg/L)	Representative Concentration Surface Soil (mg/kg)	Representative Concentration Subsurface Soil (mg/kg)	SSTL exceeded?			Relevant SSTL		
					Groundwater	Surface Soil	Subsurface Soil	Groundwater (mg/L)	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
71-43-2	Benzene	4.5E+0	7.1E-2	8.6E+0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2.9E-1	1.4E+0	7.4E-1
100-41-4	Ethylbenzene	5.7E-1	2.6E-2	5.1E+1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1.7E+0	7.0E-1	4.4E+0
1634-04-4	Methyl t-Butyl Ether	2.0E-2	1.0E-2	3.1E+0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5.9E-2	2.7E-1	2.7E-1
108-88-3	Toluene	4.5E-1	5.2E-2	9.0E+1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1.3E+0	1.4E+0	7.8E+0
1330-20-7	Xylene (mixed isomers)	1.0E+0	7.4E-2	2.3E+2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3.0E+0	2.0E+0	2.0E+1

Completed By: Cathrene Glick

Cumulative Target Risk: 1.0E-4

Target Hazard Index: 1.0E+0

Software: GSI RBCA Spreadsheet

Version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

Serial: G-265-VHX-

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Good Chevrolet Job Identification:
 Site Location: 1630 Park Street, Alameda, CA Date Completed: 12/10/98
 Completed By: Cathrene Glick

Software: GSI RBCA Spreadsheet
 Version: v 1.0

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

DEFAULT PARAMETERS

Exposure Parameter	Definition (Units)	Residential		Commercial/Industrial		
		Adult	(1-6yrs)	(1-16 yrs)	Chronic	Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (l/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg*yr/kg*d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m ³ /day)	15			20	
IRa.out	Inhalation rate outdoor (m ³ /day)	20			20	10
SA	Skin surface area (dermal) (cm ²)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² *yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	<u>TRUE</u>			<u>TRUE</u>	
AAFd	Age adjustment on skin surface area	<u>TRUE</u>			<u>TRUE</u>	
tox	Use EPA tox data for air (or PEL based)	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Surface Parameters	Definition (Units)	Commercial/Industrial		
		Residential	Chronic	Construction
t	Exposure duration (yr)	30	25	1
A	Contaminated soil area (cm ²)	<u>6.5E+06</u>		<u>9.3E+05</u>
W	Length of affected soil parallel to wind (cm)	<u>2.4E+03</u>		<u>1.5E+03</u>
W.gw	Length of affected soil parallel to groundwater (c)	<u>3.0E+03</u>		
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02		
delta	Air mixing zone height (cm)	2.0E+02		
Lss	Definition of surficial soils (cm)	<u>9.1E+01</u>		
Pe	Particulate areal emission rate (g/cm ² /s)	2.2E-10		

Groundwater Parameters	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	<u>2.6E+02</u>
I	Groundwater infiltration rate (cm/yr)	<u>1.5E+01</u>
Ugw	Groundwater Darcy velocity (cm/yr)	<u>1.5E+03</u>
Ugw.tr	Groundwater Transport velocity (cm/yr)	6.6E+03
Ks	Saturated Hydraulic Conductivity(cm/s)	
grad	Groundwater Gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
BC	Biodegradation Capacity (mg/L)	
BIO?	Is Bioattenuation Considered	TRUE
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01
loc.sat	Fraction organic carbon in water-bearing unit	1.0E-03

Matrix of Exposed Persons to Complete Exposure Pathways	Residential		Commercial/Industrial	
	Chronic	Constrctn	Chronic	Constrctn
Groundwater Pathways:				
GW.i	Groundwater Ingestion	TRUE		TRUE
GW.v	Volatilization to Outdoor Air	FALSE		TRUE
GW.b	Vapor Intrusion to Buildings	FALSE		TRUE
Soil Pathways				
S.v	Volatiles from Subsurface Soils	TRUE		TRUE
SS.v	Volatiles and Particulate Inhalation	TRUE		TRUE
SS.d	Direct Ingestion and Dermal Contact	FALSE		TRUE
S.I	Leaching to Groundwater from all Soils	TRUE		TRUE
S.b	Intrusion to Buildings - Subsurface Soils	FALSE		TRUE

Soil Parameters	Definition (Units)	Value
hc	Capillary zone thickness (cm)	<u>4.6E+00</u>
hv	Vadose zone thickness (cm)	<u>2.4E+02</u>
rho	Soil density (g/cm ³)	1.7
foc	Fraction of organic carbon in vadose zone	0.01
phi	Soil porosity in vadose zone	0.38
Lgw	Depth to groundwater (cm)	<u>2.4E+02</u>
Ls	Depth to top of affected soil (cm)	<u>9.1E+01</u>
Lsubs	Thickness of affected subsurface soils (cm)	<u>3.7E+02</u>
ph	Soil/groundwater pH	6.5
		<u>capillary</u> <u>vadose</u> <u>foundation</u>
phi.w	Volumetric water content	0.342 0.12 0.12
phi.a	Volumetric air content	0.038 0.26 0.26

Matrix of Receptor Distance and Location on- or off-site	Residential		Commercial/Industrial	
	Distance	On-Site	Distance	On-Site
GW	Groundwater receptor (cm)	4.6E+04	FALSE	TRUE
S	Inhalation receptor (cm)	4.6E+04	FALSE	TRUE

Building Parameters	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s ⁻¹)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Matrix of Target Risks	Residential	
	Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06 <u>1.0E-06</u>
TRc	Target Risk (class C carcinogens)	<u>1.0E-06</u>
THQ	Target Hazard Quotient	1.0E+00 1.0E+00
Opt	Calculation Option (1, 2, or 3)	3
Tier	RBCA Tier	2

Dispersive Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersion coefficient (cm)		
ay	Transverse dispersion coefficient (cm)		
az	Vertical dispersion coefficient (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RISK
1x10⁻⁶

RBCA CHEMICAL DATABASE

Physical Property Data

Vapor

CAS Number	Constituent	type	Molecular Weight (g/mole)	MW ref	Diffusion Coefficients				log (Koc) or log(Kd) (@ 20 - 25 C)		Henry's Law Constant (@ 20 - 25 C)		Pressure (@ 20 - 25 C)		Solubility (@ 20 - 25 C)		acid pKa	base pKb	ref
					In air (cm2/s)	Dair	re	In water (cm2/s)	Dwat	re	Koc	ref	(atm-m3) mol	(unitless)	re	Pure Component			
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A		
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5		
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A		
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29		
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5		

Site Name: Good Chevrolet

Site Location: 1630 Park Street, Al Completed By: Cathrene Glick

Date Completed: 12/10/1998

Software version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

CAS Number	Constituent	Reference Dose (mg/kg/day)				Slope Factors 1/(mg/kg/day)				EPA Weight of Evidence	Is Constituent Carcinogenic ?
		Oral RfD_oral	ref	Inhalation RfD_inhal	re	Oral SF_oral	ref	Inhalation SF_inhal	ref		
71-43-2	Benzene	-	R	1.70E-03	R	2.90E-02	A	2.90E-02	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-	R	-	R	D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-	R	-	R	D	FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	,	-	R	-	R	D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-	R	-	R	D	FALSE

Site Name: Good Chevrol Site Location: 1630 Park Street, Ala Completed By: Cathrene Glick Date Completed: 12/10/1998

Software version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level		Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors		Detection Limits			Half Life (First-Order Decay) (days)			ref
		MCL (mg/L)	reference			Oral	Dermal	Groundwater (mg/L)	ref	Soil (mg/kg)	re	Saturated	Unsaturated	
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	6 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	360	H
108-88-3	Toluene	1.00E+00	6 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	6 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: Good Chevrol Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick Date Completed: 12/10/1998

Software version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	4.5E+0		7.1E-2		8.6E+0	
Ethylbenzene	5.7E-1		2.6E-2		5.1E+1	
Methyl t-Butyl Ether	2.0E-2		1.0E-2		3.1E+0	
Toluene	4.5E-1		5.2E-2		9.0E+1	
Xylene (mixed isomers)	1.0E+0		7.4E-2		2.3E+2	

Site Name: Good Chevrolet
 Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick
 Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene	
Ethylbenzene	
Methyl t-Butyl Ether	
Toluene	
Xylene (mixed isomers)	

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

Dilution Attenuation Factor

(DAF) in Groundwater

CONSTITUENT	Residential	Comm./Ind.
	Receptor	Receptor
Benzene	1.0E+0	1.0E+0
Ethylbenzene	1.0E+0	1.0E+0
Methyl t-Butyl Ether	1.0E+0	1.0E+0
Toluene	1.0E+0	1.0E+0
Xylene (mixed isomers)	1.0E+0	1.0E+0

Site Name: Good Chevrolet

Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick

Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene	720
Ethylbenzene	228
Methyl t-Butyl Ether	360
Toluene	28
Xylene (mixed isomers)	360

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater	Air (Comm. only)
	(MCL) (mg/L)	(PEL/TLV) (mg/m ³)
Benzene		
Ethylbenzene		
Methyl t-Butyl Ether		
Toluene		
Xylene (mixed isomers)		

Site Name: Good Chevrolet
 Site Location: 1630 Park Street, Alameda, CA

Completed By: Cathrene Glick
 Date Completed: 12/10/1998

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda, CA

Date Completed: 12/10/1998

1 OF 1

**SURFACE SOIL SSTL VALUES
(< 3 FT BGS)**

Target Risk (Class A & B) 1.0E-6

MCL exposure limit?

Calculation Option: 3

Target Risk (Class C) 1.0E-6

PEL exposure limit?

Target Hazard Quotient 1.0E+0

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

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Ingestion, Inhalation and Dermal Contact		Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: 1500 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: 1500 feet	Commercial: (on-site)	Commercial: (on-site)	(mg/kg)	"■" if yes	Only if "yes" left
71-43-2	Benzene	7.1E-2	1.4E-2	4.5E-2	NA	3.3E+1	3.5E+0	7.3E+1	1.4E-2	■	5.0E+00
100-41-4	Ethylbenzene	2.6E-2	3.7E+1	1.0E+2	NA	>Res	>Res	>Res	3.7E+1	□	<1
1634-04-4	Methyl t-Butyl Ether	1.0E-2	3.4E-1	9.4E-1	NA	>Res	2.0E+2	2.4E+2	3.4E-1	□	<1
108-88-3	Toluene	5.2E-2	1.0E+2	2.8E+2	NA	>Res	>Res	>Res	1.0E+2	□	<1
1330-20-7	Xylene (mixed isomers)	7.4E-2	>Res	>Res	NA	>Res	>Res	>Res	>Res	□	<1

-210

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda, CA

Date Completed: 12/10/1998

1 OF 1

**SUBSURFACE SOIL SSTL VALUES
(> 3 FT BGS)**

Target Risk (Class A & B) 1.0E-6

MCL exposure limit?

Calculation Option: 3

Target Risk (Class C) 1.0E-6

PEL exposure limit?

Target Hazard Quotient 1.0E+0

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

CONSTITUENTS OF CONCERN		Representative Concentration (mg/kg)	Soil Leaching to Groundwater			Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL (mg/kg)	SSTL Exceeded ? "■" if yes	Required CRF Only if "yes" left
			X	Residential: 1500 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	X	Residential: (on-site)	Commercial: (on-site)			
71-43-2	Benzene	8.6E+0	1.4E-2	4.5E-2	NA	NA	4.3E-2	8.2E+0	1.2E+1	1.4E-2	■	6.3E+02
100-41-4	Ethylbenzene	5.1E+1	3.7E+1	1.0E+2	NA	NA	1.3E+2	>Res	>Res	3.7E+1	■	1.0E+00
1634-04-4	Methyl t-Butyl Ether	3.1E+0	3.4E-1	9.4E-1	NA	NA	6.3E+2	>Res	>Res	3.4E-1	■	9.0E+00
108-88-3	Toluene	9.0E+1	1.0E+2	2.8E+2	NA	NA	5.4E+1	>Res	>Res	5.4E+1	■	2.0E+00
1330-20-7	Xylene (mixed isomers)	2.3E+2	>Res	>Res	NA	NA	>Res	>Res	>Res	>Res	□	<1

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Good Chevrolet

Completed By: Cathrene Glick

Site Location: 1630 Park Street, Alameda, CA

Date Completed: 12/10/1998

1 OF 1

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
 Target Risk (Class C) 1.0E-6
 Target Hazard Quotient 1.0E+0

MCL exposure limit?
 PEL exposure limit?

Calculation Option: 3

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

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded?	Required CRF
CAS No.	Name	(mg/L)	Residential: 1500 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L)	■ " If yes	Only if "yes" left
71-43-2	Benzene	4.5E+0	2.9E-3	9.9E-3	NA	NA	7.0E-2	NA	1.0E+1	2.9E-3	■	1.5E+03
100-41-4	Ethylbenzene	5.7E-1	3.7E+0	1.0E+1	NA	NA	>Sol	NA	>Sol	3.7E+0	□	<1
1634-04-4	Methyl t-Butyl Ether	2.0E-2	1.8E-1	5.1E-1	NA	NA	3.6E+3	NA	>Sol	1.8E-1	□	<1
108-88-3	Toluene	4.5E-1	7.3E+0	2.0E+1	NA	NA	8.0E+1	NA	>Sol	7.3E+0	□	<1
1330-20-7	Xylene (mixed isomers)	1.0E+0	7.3E+1	>Sol	NA	NA	>Sol	NA	>Sol	7.3E+1	□	<1

Site Name: Good Chevrolet

Job Identification:

Site Location: 1630 Park Street, Alameda, Date Completed: 12/10/1998

SUMMARY CALCULATIONS - SSTL BY CUMULATIVE RISK

CAS No.	Constituent	Representative Concentration Groundwater (mg/L)	Representative Concentration Surface Soil (mg/kg)	Representative Concentration Subsurface Soil (mg/kg)	SSTL exceeded?			Relevant SSTL		
					Groundwater	Surface Soil	Subsurface Soil	Groundwater (mg/L)	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)
71-43-2	Benzene	4.5E+0	7.1E-2	8.6E+0	■	■	■	2.9E-3	1.4E-2	7.4E-1
100-41-4	Ethylbenzene	5.7E-1	2.6E-2	5.1E+1	□	□	■	1.7E+0	7.0E-1	4.4E+0
1634-04-4	Methyl t-Butyl Ether	2.0E-2	1.0E-2	3.1E+0	□	□	■	5.9E-2	2.7E-1	2.7E-1
108-88-3	Toluene	4.5E-1	5.2E-2	9.0E+1	□	□	■	1.3E+0	1.4E+0	7.8E+0
1330-20-7	Xylene (mixed isomers)	1.0E+0	7.4E-2	2.3E+2	□	□	■	3.0E+0	2.0E+0	2.0E+1

Completed By: Cathrene Glick

Cumulative Target Risk: 1.0E-6

Target Hazard Index: 1.0E+0

Software: GSI RBCA Spreadsheet

Version: v 1.0

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved.

Serial: G-265-VHX-

10-6
RISK