Subsurface Consultants, Inc.

R William Rudolph, P E
President

October 28, 1997
SCI 838.003

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

Addendum
Risk Assessment and Case Closure Petition
2801 MacArthur Boulevard
Oakland, California

Dear Ms. Chu:

Subsurface Consultants, Inc. (SCI) prepared a *Risk Assessment and Case Closure Petition* for the above-referenced site dated January 9, 1997. For this assessment, SCI conducted an RBCA Tier 2 site analysis for soil and groundwater at the site. Groundwater data was relatively current; however, soil data was generated as much as eight years ago, and according to biotreatability studies, it is likely that natural attenuation has been occurring since that time. The assessment indicated that groundwater posed no significant risk. The only potential risk would arise from volatilization of benzene from soils into a commercial building if it were to be constructed over one localized area (near boring B-9). However, since there is no structure over the localized hot spot, there is no significant current risk.

At the request of the Alameda County Health Care Services Agency (County), future site use scenarios needed to be evaluated. Ms. Madhulla Logan, the resident County toxicologist, suggested that selected parameters and methods used in our assessment be modified to make the assessment specific to the hot spot area. The assessment scenario was modified as follows:

- Commercial exposure time was changed from 24 hours per day to 8 hours per day for 350 days per year
- Porosity was changed from 38 percent to 30 percent (with corresponding changes in the vadose zone water and air contents - proportionalities were kept the same)
- Foundation crack thickness was changed from one percent (0.01) to one-half of one percent (0.005).

SCI implemented the suggested modifications. The RBCA worksheet and output results representing these changes are attached for your review. These modifications did not alter the overall outcome of the risk assessment evaluation (i.e., mitigation of the hot spot area would be required if a building were to be constructed over the area).

Soil in the area of boring B-9 was modeled in the RBCA spreadsheet program as described in the original report. Representative values of benzene, toluene, ethylbenzene, and xylenes for soil from boring B-9 were obtained by calculating the mean value of analytical test data collected between depths of 6.5 and 27 feet. The "representative onsite" benzene value of 1.6 milligrams per kilogram (mg/kg) exceeds the Cal-EPA corrected site specific target level of 0.25 mg/kg. Toluene, ethylbenzene, and total xylenes did not exceed their respective site specific target levels.

The original risk assessment and the revised assessment were both run using soil data from eight years ago. Therefore, it is unclear whether a risk really exists at this site given the length of time since the soil data was collected and the likelihood of natural attenuation. Before the design and implementation of site-specific remediation, SCI recommends that the risk assessment be revised using current soil data from the previously identified hot spot area to determine whether volatilization of chemicals is still of concern. It is likely that the process of natural attenuation has in fact reduced chemical concentrations and hence the potential risk would in turn be reduced. In the event that there is still a potential risk for the likely future use scenario of building construction, SCI would recommend remediation of soils in the localized area based on the new soil data.

If you have any questions regarding this site, please call either of the undersigned at (510) 299-7960.

Yours very truly,

Subsurface Consultants, Inc.

Meg Mendoza
Project Engineer

Jeriann N. Alexander, PE, REA
Civil Engineer 40469 (expires 3/31/99)
Registered Environmental Assessor 03130 (exp. 6/30/00)

MM:JNA:ly 838.003\riskupdt.doc

Attachments: RBCA Output Table
RBCA Worksheet

cc: APA Fund Ltd., c/o Mr. Nicholas Molnar
Ms. Aniko Molnar, Environmental Consultant (2 copies)

ADDRESS INFORMATION

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Mill Valley, California 94941

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: APA Fund/Comm./Area B-9 | Job Identification: 838.003 | Software: GSI RBCA Spreadsheet
Site Location: 2801 MacArthur Blvd | Date Completed: 6/23/97 | Version: v 1.0
Completed By: Meg Mendoza

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

DEFAULT PARAMETERS

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial 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			***117***	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	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

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

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

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	***1.0E-05***	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	1	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Commercial/Industrial Chronic	Commercial/Industrial Construction
t	Exposure duration (yr)	30	25	1
A	Contaminated soil area (cm^2)	***7.3E+04***		***7.3E+04***
W	Length of affected soil parallel to wind (cm)	***3.0E+02***		***3.0E+02***
W gw	Length of affected soil parallel to groundwater (cm	***9.1E+02***		
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)	1.0E+02		
Pe	Particulate areal emission rate (g/cm^2/s)	2.2E-10		

Groundwater	Definition (Units)	Value
delta gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
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	FALSE
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01
foc sat	Fraction organic carbon in water-bearing unit	1.0E-03

Soil	Definition (Units)	Value	capillary	vadose	foundation
hc	Capillary zone thickness (cm)	***9.1E+01***			
hv	Vadose zone thickness (cm)	***7.3E+02***			
rho	Soil density (g/cm^3)	1.7			
foc	Fraction of organic carbon in vadose zone	0.01			
phi	Soil porosity in vadose zone	***0.3***			
Lgw	Depth to groundwater (cm)	***8.2E+02***			
Ls	Depth to top of affected soil (cm)	***1.8E+02***			
Lsubs	Thickness of affected subsurface soils (cm)	***6.4E+02***			
pH	Soil/groundwater pH	6.5			
phi w	Volumetric water content	***0.27***	***0.09***	***0.09***	
phi a	Volumetric air content	***0.03***	***0.21***	***0.21***	

Building	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	***0.005***	

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)		

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: APA Fund/Comm./Area B-9
Site Location: 2801 MacArthur Blvd

Completed By: Meg Mendoza
Date Completed: 12/6/1996

SUBSURFACE SOIL SSTL VALUES (> 3 FT BGS)

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

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 1

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

CONSTITUENTS OF CONCERN		Representative Concentration		Soil Leaching to Groundwater			X	Soil Volatilization to Indoor Air		X	Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left	
71-43-2	Benzene	0.0E+0	NA	NA	NA		NA	8.5E-1		NA	>Res	8.5E-1	☐	<1	
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA		NA	>Res		NA	>Res	>Res	☐	<1	
108-88-3	Toluene	0.0E+0	NA	NA	NA		NA	2.9E+2		NA	>Res	2.9E+2	☐	<1	
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA		NA	>Res		NA	>Res	>Res	☐	<1	

Software: GSI RBCA Spreadsheet Serial: 0
Version: v 1.0

0.85 X 029 = 0.25 mg/kg
cal EPA
conv

B-9
AVE
= 1.6 mg/kg