



VAC

1651 Alvarado Street, San Leandro, CA 94577-2636
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ENVIRONMENTAL
PROTECTION

97 JUL 22 PM 4:10

July 14, 1997

Ms. Madhulla Logan
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Way Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Hand Augered Vadose Zone Samples
Former Chevron Service Station #9-4587
609 Oak Street
Oakland, CA

Dear Ms. Logan:

On June 12, 1997, Terra Vac hand augered at two locations at the above site to obtain additional vadose zone soil samples. A two inch auger was used to core down and obtain samples in brass sleeves at five and seven feet below grade at the locations noted on the attached site map. A photoionization detector (PID) calibrated to 100 ppm isobutylene was used to monitor ambient conditions and to obtain readings in the borehole. Both locations were as per agreement with Jennifer Eberle of Alameda County Health Care Services.

Location 1 was located 16 feet north of DVE-3, between the fuel islands and C-2. All PID readings associated with the borehole and samples never exceeded background concentrations. The hand auger was advanced to 5 feet below grade. A 2x4 inch brass sample sleeve was placed in a collection fitting and driven with a slide hammer to obtain the sample. The sleeve was then recovered, the ends covered with teflon and a plastic cap, then sealed with tape. The sample was labelled as HA-1-5 and placed in a cooler with blue ice. Hand augering continued to 7 feet, where another sample was obtained and labelled as HA-1-7. Before moving to the next location, the collection tool was washed with a low phosphate detergent and rinsed with distilled water.

Location 2 was 15 feet west of DVE-3, in the middle of the southernmost pump island, at the approximate location of a line leak that resulted in a high concentration of TPH and benzene in soil samples collected in 1987. PID readings, as measured in the hole, were at background for the first three feet. At three to four feet, readings in the hole increased to 1000 ppm, while remaining at background levels in the breathing zone.

The odor was of very weathered gasoline. Conditions remained the same at five feet, where a sample (HA-2-5) was obtained. At six feet, PID readings in the hole dropped to 200 ppm. At seven feet, where another sample (HA-2-7) was collected, the soil became sandier, darker and moister than the silt encountered above.


All samples were submitted to Sequoia Laboratories for TPHg and BTEX analysis. Results were below detection limits for all compounds at the first location, closest to residences. ~~The samples taken from the area of the 1987 line leak indicated 23 ppm benzene at 5 feet and 2.1 ppm benzene at seven feet. The composite from five and seven feet at this location in 1987 was 150 ppm benzene versus an average of 12.5 ppm~~ $\frac{23+2}{2}$ for the current samples, so natural attenuation has substantially reduced the residual.

Also attached is a volatilization model to indoor air, utilized to calculate the risk that would be associated with the residual maximum benzene concentration of 23 ppm. The formulae are taken from the *USEPA Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A)*. The parameters used are for a commercial case with a 30x30 foot building, a 6-inch foundation, 14 feet in height (standard drop ceiling), and a very conservative air exchange rate of 20 liters/day. The risk is calculated to be 3.74×10^{-7} , below 1 in 1,000,000 with the maximum benzene concentration. As in other commonly used models, soil concentrations are assumed to be constant over the entire time period, with no biodegradation taken into consideration either at the source nor between the source and the receptor.

Both TPHg & B are exceed prior cleanup levels (100/1 ppm).
A revised Table 2 for management plan threshold limits at the site is included that utilizes the site specific target levels generated by GSI-RBCA software that is protective of human health from onsite inhalation potential from hydrocarbon impacted groundwater. An average of 420 ppb benzene in groundwater samples from the listed onsite wells of C-1, C-2 and CR-1 would require notification to Alameda County, resampling and, if initial results are confirmed, a reevaluation of site conditions and further activities.

If you have any questions or comments, please call me at (510) 351-8900.

Sincerely,
Terra Vac Corporation

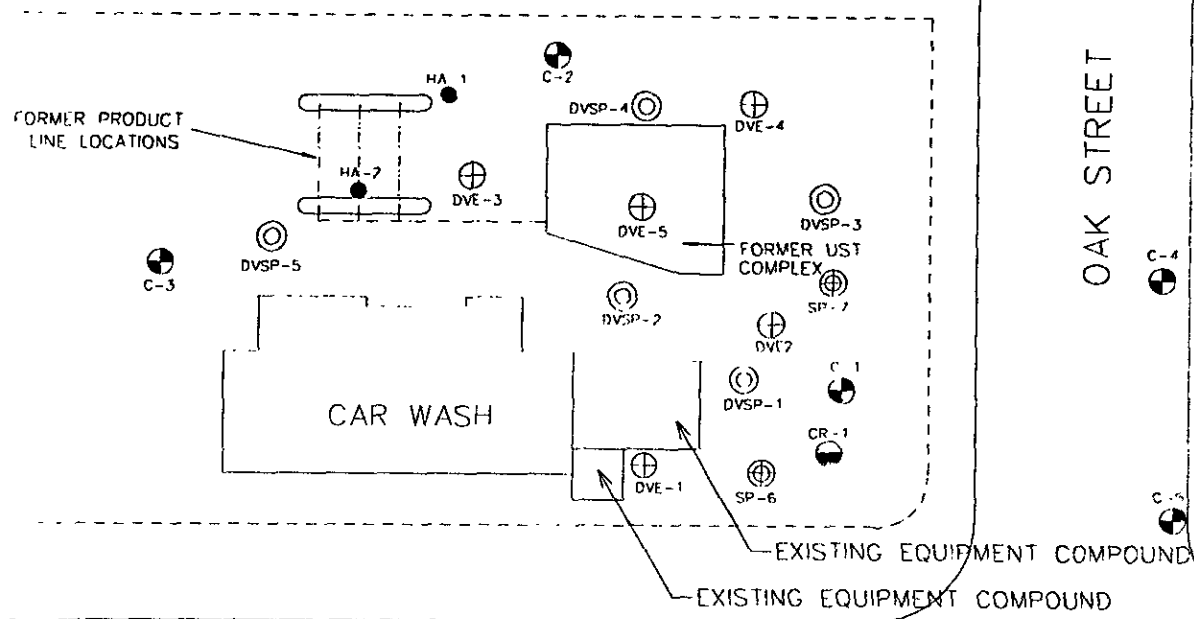

Robert A. Dahl
Project Manager

cc: Phil Briggs, Chevron
Jennifer Eberle, ACHCS
30-0219.10



PRINTING COMPANY

PARKING LOT



OAK STREET

Former Auto Repair Shop

6th STREET

LEGEND

- Groundwater Monitoring Well
- Groundwater Recovery Well
- Entrainment Extraction Well
- Drill Completed Well
- Charge Well
- Free Product

Extended Site Plan
Former Chevron Station 9-4587
609 Oak Street
Oakland, California

Project	30-0219	Drawn	RJT
Date	9/17/96	Revision	
Scale	1" = 30'	Checked	

TERRA VAC 1651 Alvarado Street
San Leandro, CA 94577
(510) 351-8900 Fax: -0221

Figure
3

$$\text{RISK} = \text{CDI} \cdot \text{SF}$$

$$\text{CDI (mg/kg-day)} = \frac{C_{\text{indoor}} \cdot \text{IR}_{\text{air}} \cdot \text{ET} \cdot \text{EF} \cdot \text{ED}}{\text{BW} \cdot \text{AT}_c}$$

<u>Variable</u>	<u>Value</u>	<u>Unit</u>	<u>Description</u>
C_{indoor}	442.0E-9	mg/m ³	Contaminant concentration in air
BW	70	kg	Adult body weight
AT_c	70	years	Averaging time for carcinogens
SF_i	0.1	(mg/kg-day) ⁻¹	Inhalation cancer slope factor
IR_{air}	0.83	m ³ /hr	Daily indoor inhalation rate
EF	250	days/year	Exposure frequency
ED	25	year	Exposure duration, com.
ET	8.00	hours/day	Exposure time
SF	0.1	(mg/kg-day) ⁻¹	slope factor for benzene (CA)
CDI	3.74E-06	mg/kg-day	chronic daily intake

RISK = 3.74E-07

$$C_{\text{indoor}} \text{ (g/cm}^3\text{)} = \frac{E_{\text{max}}}{V_B * E_B}$$

$$E_{\text{max}} \text{ (g/d)} = \frac{Q_B * C_v^{\text{eq}} * (D_s^{\text{eff}} * A_B) / (Q_B * L_s) * \exp\{(Q_{\text{soil}} * L_{\text{crack}}) / (D_{\text{crack}}^{\text{eff}} * A_{\text{crack}})\}}{\exp\{(Q_{\text{soil}} * L_{\text{crack}}) / (D_{\text{crack}}^{\text{eff}} * A_{\text{crack}})\} + (D_s^{\text{eff}} * A_B) / (Q_B * L_s) + (D_s^{\text{eff}} * A_B) / (Q_B * L_s) * \exp\{(Q_{\text{soil}} * L_{\text{crack}}) / (D_{\text{crack}}^{\text{eff}} * A_{\text{crack}})\}}$$

$$D_s^{\text{eff}} \text{ (cm}^2\text{/s)} = \frac{D_{\text{air}} * (q_{\text{as}}^{3.33} / q_T^2) + D_{\text{wat}} * H^{-1} * (q_{\text{ws}}^{3.33} / q_T^2)}{}$$

$$D_{\text{crack}}^{\text{eff}} \text{ (cm}^2\text{/s)} = \frac{D_{\text{air}} * (q_{\text{acrack}}^{3.33} / q_T^2) + D_{\text{wat}} * H^{-1} * (q_{\text{wcrack}}^{3.33} / q_T^2)}{}$$

$$C_v^{\text{eq}} \text{ (g/cm}^3\text{-vapor)} = \frac{H * C_{\text{soil}} * r_s}{q_{\text{ws}} + k_s * r_s + H * q_{\text{as}}}$$

Variable	Value	Unit	Description
q_{ws}	0.12	$\text{cm}^3\text{-H}_2\text{O/cm}^3\text{-soil}$	volumetric water content in foundation/wall
k_s	0.38	$\text{cm}^3\text{-H}_2\text{O/g-soil}$	soil-water sorption coefficient ($f_{\text{oc}} \times k_{\text{oc}}$)
r_s	1.70	$\text{g-soil/cm}^3\text{-soil}$	soil bulk density
H	0.22	$\text{cm}^3\text{-H}_2\text{O/cm}^3\text{-vapor}$	Henry's Law Constant
q_{as}	0.26	$\text{cm}^3\text{-vapor/cm}^3\text{-soil}$	volumetric air content in vadose zone soils
L_s	76.20	cm	distance between foundation/walls and hydrocarbon vapor source
Q_B	0.60	$\text{cm}^3\text{/s}$	volumetric flowrate of air within enclosed space
h	426.72	cm	height of structure
L_{crack}	15.24	cm	enclosed space foundation or wall thickness
f_{oc}	0.01	g-C/g-soil	fraction of organic carbon in soil
$\text{LOG}k_{\text{oc}}$	1.58	$\text{cm}^3\text{-H}_2\text{O/g-C}$	carbon-water sorption coefficient
q_T	0.31	$\text{cm}^3\text{/cm}^3\text{-soil}$	total soil porosity, actual data from DVE3 sample at 5 ft depth
D_{air}	8,035.20	$\text{cm}^2\text{/d}$	diffusion coefficient in air
D_{wat}	0.95	$\text{cm}^2\text{/d}$	diffusion coefficient in water
q_{acrack}	0.26	$\text{cm}^3\text{-air/cm}^3\text{-total vol.}$	volumetric air content in foundation/wall cracks
A_B	8.36E+05	cm^2	total area of enclosed space exposed to vapor intrusion (area of foundation)
Q_{soil}	0.60	$\text{cm}^3\text{/s}$	volumetric infiltration flowrate of soil gas into enclosed space
A_{crack}	8.36E+03	cm^2	area of foundation through which vapors are transported (area of crack, open seams, etc.)
V_B	3.57E+08	cm^3	volume of enclosed space
E_B	19.87	1/d	enclosed space air exchange rate
C_{soil}	2.30E-05	g/g-soil	total soil hydrocarbon concentration (maximum recorded)
D_s^{eff}	8.14E+07	$\text{cm}^2\text{/d}$	effective diffusion coefficient in soil based on vapor-phase concentration
$D_{\text{crack}}^{\text{eff}}$	8.14E+07	$\text{cm}^2\text{/d}$	effective diffusion coefficient through foundation cracks
C_v^{eq}	1.04E-05	$\text{g/cm}^3\text{-vapor}$	equilibrium vapor concentration
E_{max}	3.13E-06	g/day	vapor emission rate into enclosed space

$$C_{\text{indoor}} \text{ (g/cm}^3\text{)} = 4.42\text{E-16}$$

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Chevron 9-4587
 Site Location: Oak Street, Oakland

Completed By: R.A. Dahl
 Date Completed: 6/20/1997

1 OF 1

GROUNDWATER SSTL VALUES

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: 2

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

CONSTITUENTS OF CONCERN		Representative Concentration (mg/L)	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL (mg/L)	SSTL Exceeded ? "■" if yes	Required CRF Only if "yes" left
			X	Residential: 1000 feet	Commercial: (on-site)	Regulatory(MCL): 1000 feet	X	Residential: (on-site)	Commercial: (on-site)			
CAS No.	Name	(mg/L)										
71-43-2	Benzene	3.5E-3	>Sol	NA	>Sol	NA	4.2E-1	NA	4.2E+1	4.2E-1	<input type="checkbox"/>	<1

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Chevron 9-4587
 Site Location: Oak Street, Oakland

Job Identification: 30-0219
 Date Completed: 6/20/97
 Completed By: R.A. Dahl

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	Constructn
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	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?	TRUE				

Matrix of Exposed Persons to Complete Exposure Pathways	Residential		Commercial/Industrial	
	Chronic	Constructn	Chronic	Constructn
Groundwater Pathways:				
GW i	Groundwater Ingestion	TRUE		FALSE
GW v	Volatilization to Outdoor Air	FALSE		TRUE
GW b	Vapor Intrusion to Buildings	FALSE		TRUE
Soil Pathways				
S v	Volatiles from Subsurface Soils	FALSE		TRUE
SS v	Volatiles and Particulate Inhalation	FALSE		TRUE
SS d	Direct Ingestion and Dermal Contact	FALSE		TRUE
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		Commercial/Industrial		
	Distance	On-Site	Distance	On-Site	
GW	Groundwater receptor (cm)	3.0E+04	FALSE	3.0E+04	FALSE
S	Inhalation receptor (cm)		FALSE		TRUE

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

Surface Parameters	Definition (Units)	Commercial/Industrial		
		Residential	Chronic	Construction
t	Exposure duration (yr)	30	25	1
A	Contaminated soil area (cm ²)	<u>1.9E+08</u>		1.0E+06
W	Length of affected soil parallel to wind (cm)	<u>1.2E+03</u>		1.0E+03
Wgw	Length of affected soil parallel to groundwater (cm)	<u>1.4E+03</u>		
Uar	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>		
Pa	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)	<u>1.9E+02</u>
Ugw tr	Groundwater Transport velocity (cm/yr)	<u>5.0E+02</u>
Ks	Saturated Hydraulic Conductivity (cm/s)	
grad	Groundwater Gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	1.8E+03
Sd	Depth of groundwater source zone (cm)	3.0E+02
BC	Biodegradation Capacity (mg/L)	
BIO?	Is Bioattenuation Considered	TRUE
phi eff	Effective Porosity in Water-Bearing Unit	3.8E-01
fcc.sat	Fraction organic carbon in water-bearing unit	1.0E-03

Soil	Definition (Units)	Value
hc	Capillary zone thickness (cm)	<u>3.0E+00</u>
hv	Vadose zone thickness (cm)	<u>2.6E+02</u>
rho	Soil density (g/cm ³)	1.8
toc	Fraction of organic carbon in vadose zone	0.01
phi	Soil porosity in vadose zone	0.38
Lgw	Depth to groundwater (cm)	<u>2.8E+02</u>
Ls	Depth to top of affected soil (cm)	<u>7.8E+01</u>
Lsubs	Thickness of affected subsurface soils (cm)	<u>1.8E+02</u>
pH	Soil/groundwater pH	6.5
phi w	Volumetric water content	0.342
phi a	Volumetric air content	0.038

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	<u>5.6E-04</u>
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)	3.0E+03	
ay	Transverse dispersion coefficient (cm)	1.0E+03	
az	Vertical dispersion coefficient (cm)	1.5E+02	
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

Table 2
Management Plan Threshold Limits
Former Chevron Station 9-4587
609 Oak Street
Oakland, CA

Well ID	Benzene Concentration Highest Observed (ppb)	Benzene Concentration 12/19/96 (ppb)	Benzene Concentration Threshold Limit (ppb)
C-1	11,000	<0.5	*420
C-2	8,200	<0.5	*420
C-5	330	4.2	100
CR-1	9400	0.9	*420
			*as average for onsite

**APPENDIX A
LABORATORY REPORTS**



Terra Vac	Client Proj. ID: Chevron 9-4587/30-0219	Sampled: 06/12/97
1651 Alvarado St.	Sample Descript: HA-1-5	Received: 06/13/97
San Leandro, CA 94577	Matrix: SOLID	Extracted: 06/17/97
Attention: Tony Dahl	Analysis Method: 8015Mod/8020	Analyzed: 06/17/97
	Lab Number: 9706769-01	Reported: 06/20/97


QC Batch Number: GC061797BTEXEXA
Instrument ID: GCHP07

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	83
4-Bromofluorobenzene	60 140	110

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210



Tod Granicher
Project Manager





Terra Vac
1651 Alvarado St.
San Leandro, CA 94577

Client Proj. ID: Chevron 9-4587/30-0219
Sample Descript: HA-1-7
Matrix: SOLID
Analysis Method: 8015Mod/8020
Lab Number: 9706769-02

Sampled: 06/12/97
Received: 06/13/97
Extracted: 06/17/97
Analyzed: 06/17/97
Reported: 06/20/97

QC Batch Number: GC061797BTEXEXA
Instrument ID: GCHP07

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	86
4-Bromofluorobenzene	60 140	105

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210



Tod Granicher
Project Manager





Terra Vac 1651 Alvarado St. San Leandro, CA 94577	Client Proj. ID: Chevron 9-4587/30-0219 Sample Descript: HA-2-5 Matrix: SOLID Analysis Method: 8015Mod/8020 Lab Number: 9706769-03	Sampled: 06/12/97 Received: 06/13/97 Extracted: 06/17/97 Analyzed: 06/19/97 Reported: 06/20/97
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QC Batch Number: GC061797BTEXEXA
Instrument ID: GCHP01

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	500	2800
Benzene	2.5	20
Toluene	2.5	210
Ethyl Benzene	2.5	60
Xylenes (Total)	2.5	830
Chromatogram Pattern:		Gas
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70	130
4-Bromofluorobenzene	60	140

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager





Terra Vac Client Proj. ID: Chevron 9-4587/30-0219 Sampled: 06/12/97
1651 Alvarado St. Sample Descript: HA-2-7 Received: 06/13/97
San Leandro, CA 94577 Matrix: SOLID Extracted: 06/17/97
Attention: Tony Dahl Analysis Method: 8015Mod/8020 Analyzed: 06/18/97
Lab Number: 9706769-04 Reported: 06/20/97

QC Batch Number: GC061797BTEXEXA
Instrument ID: GCHP07

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Table with columns: Analyte, Detection Limit mg/Kg, Sample Results mg/Kg. Rows include TPHH as Gas (100, 310), Benzene (0.50, 2.1), Toluene (0.50, 21), Ethyl Benzene (0.50, 7.5), Xylenes (Total) (0.50, 52), Chromatogram Pattern (Gas), Surrogates (Control Limits %, % Recovery).

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager





Terra Vac
1651 Alvarado St.
San Leandro, CA 94577
Attention: Tony Dahl

Client Project ID: Chevron 9-4587 / 30-0219
Matrix: Solid

Work Order #: 9706769 -01-09

Reported: Jul 9, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC061797BTEXEXA	GC061797BTEXEXA	GC061797BTEXEXA	GC061797BTEXEXA	GC061797BTEXEXA
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030

Analyst:	A. Porter	A. Porter	A. Porter	A. Porter	A. Porter
MS/MSD #:	970649501	970649501	970649501	970649501	970649501
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Analyzed Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Instrument I.D.#:	GCHP7	GCHP7	GCHP7	GCHP7	GCHP7
Conc. Spiked:	0.20 mg/Kg	0.20 mg/Kg	0.20 mg/Kg	0.60 mg/Kg	1.2 mg/Kg
Result:	0.18	0.18	0.18	0.54	1.1
MS % Recovery:	90	90	90	90	92
Dup. Result:	0.17	0.17	0.18	0.52	1.1
MSD % Recov.:	85	85	90	87	92
RPD:	5.7	5.7	0.0	3.8	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-25

LCS #:	BLK061797	BLK061797	BLK061797	BLK061797	BLK061797
Prepared Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Analyzed Date:	6/17/97	6/17/97	6/17/97	6/17/97	6/17/97
Instrument I.D.#:	GCHP7	GCHP7	GCHP7	GCHP7	GCHP7
Conc. Spiked:	0.20 mg/Kg	0.20 mg/Kg	0.20 mg/Kg	0.60 mg/Kg	1.2 mg/Kg
LCS Result:	0.20	0.20	0.20	0.61	1.3
LCS % Recov.:	100	100	100	102	108

MS/MSD	60-140	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130	70-130
Control Limits					

Please Note:

The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL


Tod Granicher
Project Manager

** MS= Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

9706769.TTT <1>





Terra Vac

Client Proj. ID: Chevron 9-4587/30-0219

Received: 06/13/97

1651 Alvarado St.

Lab Proj. ID: 9706769

Reported: 06/20/97

San Leandro, CA 94577

Attention: Tony Dahl

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 9 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL



Tod Granicher
Project Manager



