

June 1, 1994

Ms. Jennifer Eberle  
Hazardous Materials Specialist  
Alameda County Health Agency  
80 Swan Way, Room 350  
Oakland, California 94621

Subject: Report of Vacuum Extraction Feasibility Testing at Former Gin's Arco at 7th and Harrison Streets in Oakland, California

Dear Ms. Eberle:

Please find enclosed one copy of Remediation Testing and Design's (RTD) letter report regarding vacuum extraction feasibility testing (VEFT) at the Former Gin's Arco Site located at 706 Harrison Street in Oakland, California. The project was conducted by RTD during the week of April 18 to April 22, 1994.

Sincerely,



Bo K. Gin

Attachment

ALCO  
HAZMAT  
94 JUN -9 PM 1:29

# REMEDIATION TESTING AND DESIGN

ENVIRONMENTAL INVESTIGATION REMEDIATION SITE CLOSURE

609 Pacific Avenue, Suite 201, Santa Cruz CA 95060

Phone: (408) 458-1612 Fax: (408) 458-1509

May 27, 1994

Mr. Bo K. Gin  
288 Eleventh Street  
Oakland, California 94607

Subject: Report of Vacuum Extraction Feasibility Testing at Former Gin's Arco at 7th and Harrison Streets in Oakland, California

Dear Mr. Gin:

Remediation, Testing and Design (RTD) is pleased to submit the following letter report regarding vacuum extraction feasibility testing (VEFT) at the Former Gin's Arco Site located at 706 Harrison Street in Oakland, California. The Scope of Work proposed was conducted for Mr. Gin by RTD during the week of April 18 to April 22, 1994.

## SITE BACKGROUND

The subject Site is located at 706 Harrison Street in Oakland on the corner of 7th Street and Harrison Street. A General Site Location Map is included as **Figure 1** and a detailed Site Features Map is included as **Figure 2**. The Site contained a gasoline service station for many years. Seven underground fuel tanks have been removed from the Site, as well as the above ground structures. Three monitoring wells and two vent wells have been installed at the Site. Subsequent investigations indicate soils and groundwater impacts.

## SCOPE OF WORK

RTD conducted the following activities: 1) Notified the Bay Area Air Quality Management District (BAAQMD) of the VEFT, 2) Performed vacuum extraction feasibility testing (VEFT), and 3) Prepared this VEFT summary report. The site work required four full days of field work. Exact testing details for the site were modified based on site conditions, but generally followed the proposed field activities described below.

### BAAQMD Notification

For the VEFT, air discharge permits were not needed, as the extracted hydrocarbon vapors were abated by vapor phase, granular activated carbon (GAC) and the test was considered a short term pilot study. RTD submitted an exemption request letter to the Bay Area Air Quality Management District (BAAQMD) outlining testing procedures and notifying them of the test date, the equipment to be used, the type of vapor abatement, and the monitoring procedures one week prior to conducting the VEFT. A copy of the BAAQMD exemption request is included in **Appendix A**.

## Vacuum Extraction Feasibility Testing

As part of the VEFT activities, groundwater levels in all existing on-site monitor wells were measured. Also as part of the VEFT activities, flow screening was performed to determine preliminary flow characteristics of the vapor extraction wells. Standard vacuum extraction (SVE) flow screening was conducted on each vent well for a period of approximately 1-hour each. During SVE flow screening, a pump induced vacuum was applied to each vent well determine general vacuum flow characteristics and extracted vapor concentrations. The extracted vapors were field screened for total volatile hydrocarbons (TVH) using a Beckman Model 400 Total Hydrocarbon Analyzer equipped with a flame ionization detector (FID). The FID was calibrated with a propane standard of 30,000 parts per million by volume (ppmv), and 500 microliters (uL) of regular unleaded gasoline in 50 liters (L) of zero-grade air. TVH was also periodically monitored using Sensidyne/Gastec detector tubes calibrated specifically to gasoline in vapor. Following SVE flow screening, drop pipe flow screening was conducted for approximately 1-hour in each vent well to evaluate the utility of using the drop pipe, and to determine the best drop pipe position for the longer term testing. The drop pipe consists of 1-inch diameter, schedule 40, flush threaded PVC pipe with a 3-foot range of perforations on the bottom section of pipe. The flow screening activities were conducted on April 18, 1994.

RTD conducted the VEFT using the vapor extraction wells (VW-1 and VW-2) and the three monitoring wells (MW-1 to MW-3) to determine the effectiveness of using vacuum extraction for remediation of soils, groundwater and removal of insoluble hydrocarbons.

The VEFT determines the capture radius, the distance at which the pressure differential created by a vacuum is measured in the lateral plane. This was noted by recording the vacuum gradient in neighboring wells in inches of water ("H<sub>2</sub>O) using magnehelic differential pressure gauges. The detection limit for the vacuum gradient ranged from 0.01 to 5.0 "H<sub>2</sub>O. During all extraction testing, TVH was monitored with the Beckman FID and gasoline vapors were monitored with Sensidyne/Gastec direct reading gasoline detector tubes.

The VEFT was conducted using RTDs vacuum extraction testing unit (VETU) consisting of: a Kohler 12-horsepower engine directly driving a Sutorbilt Model 3ML positive displacement blower capable of displacing 125 standard cubic feet per minute (scfm) under a vacuum load of 15 inches of mercury, a 55-gallon water accumulator to remove any vaporized water, and two granular activated carbon (GAC) canisters in series, each containing 200-pounds of vapor phase GAC. Flow rates were measured with a direct reading in-line Rotometer.

RTD conducted the longer term VEFT using VW-1 and VW-2 combined as the extraction points with drop pipes installed in each well. The testing duration was approximately for 8-hours on April 19, 1994, 8-hours on April 21, 1994 and 4-hours on April 22, 1994. Based on the results of the flow screening, the drop pipe perforation interval for VW-1 was 15- to 18-feet below grade and for VW-2 was 14- to 17-feet below grade.

At the end of the testing, extracted soil gasses were collected into a 1-L Tedlar air bag. RTD transported the air sample under chain of custody documentation to AN/EN, Inc, a California Department of Health Services Certified Analytical Laboratory for analysis of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethyl benzene and total xylenes (BTEX).

## **RESULTS**

### Groundwater Level and Free Product Measurements

Prior to conducting any vacuum extraction testing, RTD measured depths to groundwater in the three monitor wells and free product thickness in the vent wells. These data are included on

**Table 1 and Table 2.** These measurements indicated that groundwater levels in the monitor wells is above the screen interval, making reliable vacuum influence measurements using these wells physically impossible. Approximately 0.4-feet of free product was measured in each of the vent wells.

### Flow Screening

**Table 1** presents the results of the flow screening performed as the initial testing protocol to verify flow capabilities and characteristics from the vent well VW-1. SVE flow screening resulted in: a flow rate of 8 standard cubic feet per minute (scfm) under a vacuum load of approximately 17.5-inches of mercury ("Hg), TVH as gasoline using the FID was approximately 6,200 ppmv, the average groundwater removal rate was approximately 0.11 gallons per minute (gpm). Drop pipe flow screening resulted in: a flow rate of approximately 10 scfm under a vacuum load of 17.6 "Hg, TVH as gasoline using the FID was approximately 6,800 ppmv and using the Sensidyne/Gastec detector tubes was 10,500 ppmv, and the average groundwater removal rate was approximately 0.29 gpm. Both positive and negative pressures were noted in the monitor wells, indicating that these wells were not reliable for measuring vacuum influence.

**Table 2** presents the results of the flow screening performed as the initial testing protocol to verify flow capabilities and characteristics from the vent well VW-2. SVE flow screening resulted in: a flow rate of 1 scfm under a vacuum load of approximately 18.1 "Hg, TVH as gasoline using the FID was approximately 8,100 ppmv and using the Sensidyne/Gastec detector tubes was 16,000 ppmv, and the average groundwater removal rate was approximately 0.16 gpm. Drop pipe flow screening resulted in: a flow rate of approximately 2 scfm under a vacuum load of 18 "Hg, TVH as gasoline using the FID was approximately 8,200 ppmv and using the Sensidyne/Gastec detector tubes was 15,000 ppmv, and the average groundwater removal rate was approximately 0.27 gpm. Both positive and negative pressures were noted in the monitor wells, indicating that these wells were not reliable for measuring vacuum influence.

### Vacuum Extraction Feasibility Testing

The first 8-hour VEFT was conducted on April 19, 1994 and the results are presented on **Table 3**. The testing was conducted using combined flow from VW-1 and VW-2 using the drop pipe. This VEFT resulted in: a stabilized flow rate of approximately 14 scfm under a vacuum load of 15.1 "Hg, TVH as gasoline using the FID was approximately 7,200 ppmv and using the Sensidyne/Gastec detector tubes was 10,000 ppmv, and the average groundwater removal rate was approximately 0.20 gpm. Both positive and negative pressures were noted in the monitor wells, indicating that these wells were not reliable for measuring vacuum influence.

The second 8-hour VEFT was conducted on April 21, 1994 and the results are presented on **Table 4**. The testing was conducted using combined flow from VW-1 and VW-2 using the drop pipe. This VEFT resulted in: a stabilized flow rate of approximately 16 scfm under a vacuum load of 15 "Hg, TVH as gasoline using the FID was approximately 5,900 ppmv and using the Sensidyne/Gastec detector tubes was 8,000 ppmv, and the average groundwater removal rate was approximately 0.15 gpm. Both positive and negative pressures were noted in the monitor wells, indicating that these wells were not reliable for measuring vacuum influence.

The final phase VEFT was conducted on April 22, 1994 for a period of 4-hours and the results are presented on **Table 5**. The testing was conducted using combined flow from VW-1 and VW-2 using the drop pipe. This VEFT resulted in: a stabilized flow rate of approximately 16 scfm under a vacuum load of 16 "Hg, TVH as gasoline using the FID was approximately 5,900 ppmv and using the Sensidyne/Gastec detector tubes was 6,000 ppmv, and the average groundwater removal rate was approximately 0.15 gpm. A 1-L Tedlar air bag was collected at the end of the test and analyzed for TPHg and BTEX and AN/EN. The laboratory report is included in

Appendix B and indicated a gasoline vapor concentration of 5,200 ppmv. Both positive and negative pressures were noted in the monitor wells, indicating that these wells were not reliable for measuring vacuum influence.

## DISCUSSION

The VEFTs showed that vacuum extraction can be used as an effective remediation technique at the site for removing hydrocarbons from unsaturated soils, the capillary fringe and the water table surface. At the end of the last test, the overall gasoline removal rate was approximately 1.26 pounds per hour. The testing was conducted during seasonal high water table conditions and likely represents the lowest vapor flow rate. As the water table declines, vapor flow rates and gasoline removal rates will most likely increase and groundwater removal rates may also decline.

## RECOMMENDATIONS

Based on recent and past environmental compliance activities conducted at the subject site, RTD makes the following recommendations for future work:

1. Design, permit, install, and operate a vacuum extraction treatment system with drop pipe for extracting and treating soil vapors and groundwater utilizing VW-1 and VW-2 as the extraction points. Incorporation of three additional vacuum/sparging points, as shown on Figure 3, will likely reduce the overall remediation time and add flexibility to the system. The treatment system should be capable of extracting up to 100 standard cubic feet per minute (scfm) vapor flow under a vacuum load of 15 "Hg, abating up to 5 pounds per hour of gasoline, and the ability to treat groundwater up to 1000 gallons per day in batch mode.
2. Implement the remedial program in such a manner that minimizes the overall system construction and equipment operation impacts on neighboring business operations. Schedule and coordinate work to minimize overall impacts. Install the system above ground directly adjacent to VW-1 and VW-2. Fence the area and provide for sound abatement of the equipment, if necessary.
3. Continue the groundwater monitoring program for MW-1, MW-2, MW-3 on the required basis.

If you have any questions or comments regarding this report, please call me or Tom Armstrong at (408) 458-1612.

Sincerely,

## **REMEDATION TESTING AND DESIGN**



Howard E. Whitney, R.G.  
Principal Hydrogeologist



Attachments

cc: Dr. John Sammons, Dennis Bates Associates, Inc.  
Ms. Jennifer Eberle, Alameda County Health Agency

**Table 1 - Vacuum Extraction Flow Screening - VW-1**

**SITE LOCATION:** 7th & Harrison, Oakland, California

**DATE:** April 18, 1994

**EXTRACTION POINT ID#:** VW-1

**START TIME:** 09:30

<b>TIME MONITORED</b>	09:40	09:55	10:35	10:45	11:10	11:30	
<b>TIME INTERVAL (min)</b>	10	25	65	75	100	120	
<b>VACUUM ("Hg)</b>	17.6	17.6	17.5	<b>Begin Drop Pipe</b>	17.6	17.6	
<b>FLOW RATE (scfm)</b>	8	8	8	<b>Testing</b>	9	10	
<b>TVH, ppm (as propane)</b>	-----	28,125	27,750	-----	30,000	30,375	
<b>(as gasoline)</b>	-----	6,328	6,244	-----	6,750	6,834	
<b>Sensidyne/GASTEC ppm as gasoline</b>	-----	-----	-----	-----	10,500	-----	
<b>INFLUENCE DATA</b>	<b>Inches of Water</b>						
<b>ID#</b>	<b>Distance</b>						
MW-1	32	-----	-----	ND	-----	+0.02	-0.01
MW-2	27	-----	-----	ND	-----	-0.02	+0.01
MW-3	70	-----	-----	ND	-----	-0.01	ND
<b>Total H2O (gallons)</b>		-----	3	7	8	13	21

**NOTES:** Pre-testing groundwater levels: MW-1 = 17.18-feet below top of casing (BTOC), MW-2 = 18.17-feet BTOC and MW-3 = 17.60-feet BTOC. Calibrate FID at 0930 hours. Prior to testing, VW1 contained 0.42-feet free product. After testing, VW1 contained 0.04-feet free product.

**Table 2 - Vacuum Extraction Flow Screening - VW-2**

**SITE LOCATION:** 7th & Harrison, Oakland, California

**DATE:** April 18, 1994

**EXTRACTION POINT ID#:** VW-2

**START TIME:** 12:10

<b>TIME MONITORED</b>	12:15	12:45	13:20	13:30	13:50	14:30	
<b>TIME INTERVAL (min)</b>	5	35	70	80	100	140	
<b>VACUUM ("Hg)</b>	18.2	18.2	18.1	<b>Begin Drop Pipe</b>	18	18	
<b>FLOW RATE (scfm)</b>	1	1	1	<b>Testing</b>	2	2	
<b>TVH, ppm (as propane)</b>	-----	34,500	36,375	-----	36,750	37,125	
<b>(as gasoline)</b>	-----	7,763	8,184	-----	8,269	8,353	
<b>Sensidyne/GASTEC ppm as gasoline</b>	-----	-----	16,000	-----	-----	15,000	
<b>INFLUENCE DATA</b>	<b>Inches of Water</b>						
<b>ID#</b>	<b>Distance</b>						
MW-1	32	-----	-----	ND	-----	+0.01	ND
MW-2	27	-----	-----	ND	-----	-0.02	-0.01
MW-3	70	-----	-----	ND	-----	-0.01	ND
<b>Total H2O (gallons)</b>		-----	5	11	12	17	28

**NOTES:** Calibrate FID at 1155 hours. Prior to testing, VW2 contained 0.43-feet free product. After testing, VW2 contained 0.38-feet free product.

**Table 3 - Drop Pipe Vacuum Extraction Testing - VW-1 & VW-2**

**SITE LOCATION:** 7th & Harrison, Oakland, California

**DATE:** April 19, 1994

**EXTRACTION POINT ID#:** VW-1 & VW-2

**START TIME:** 09:10

<b>TIME MONITORED</b>	09:15	10:15	11:13	12:09	13:14	14:03	
<b>TIME INTERVAL (min)</b>	5	65	123	179	244	293	
<b>VACUUM ("Hg)</b>	15.5	15.5	15.4	15.4	15.3	15.3	
<b>FLOW RATE (scfm)</b>	12	12	13	13	13	13	
<b>TVH, ppm (as propane) (as gasoline)</b>	-----	34,500 7,763	36,000 8,100	33,750 7,594	33,750 7,594	33,375 7,509	
<b>Sensidyne/GASTEC ppm as gasoline</b>	-----	-----	12,500	-----	-----	11,000	
<b>INFLUENCE DATA</b>	<b>Inches of Water</b>						
<b>ID#</b>	<b>Distance</b>						
MW-1	32	-----	ND	ND	+0.01	-0.01	ND
MW-2	27	-----	ND	ND	ND	-0.04	-0.02
MW-3	70	-----	ND	+0.04	ND	-0.03	-0.01
<b>Total H2O (gallons)</b>		-----	13	25	39	52	63

**NOTES:** Calibrate FID at 0855 and 1331 hours. Prior to testing, VW1 contained 0.1-feet free product and VW2 contained 0.40-feet free product.



**Table 3 cont. - Drop Pipe Vacuum Extraction Testing - VW-1 & VW-2**

**SITE LOCATION:** 7th & Harrison, Oakland, California

**DATE:** April 19, 1994

**EXTRACTION POINT ID#:** VW-1 & VW-2

**START TIME:** 09:15

<b>TIME MONITORED</b>	14:58	15:56	16:59	17:15		
<b>TIME INTERVAL (min)</b>	343	401	464	480		
<b>VACUUM ("Hg)</b>	15.2	15.1	15.1	15.1		
<b>FLOW RATE (scfm)</b>	13	14	14	14		
<b>TVH, ppm (as propane) (as gasoline)</b>	33,000 7,425	32,625 7,341	32,250 7,256	----- -----		
<b>Sensidyne/GASTEC ppm as gasoline</b>	10,000	-----	-----	-----		
<b>INFLUENCE DATA</b>	<b>Inches of Water</b>					
<b>ID#</b>	<b>Distance</b>					
<b>MW-1</b>	32	+0.02	+0.02	ND	-----	
<b>MW-2</b>	27	+0.005	+0.005	ND	-----	
<b>MW-3</b>	70	+0.15	+0.15	+0.10	-----	
<b>Total H2O (gallons)</b>		73	83	93	95	

**NOTES:** Stop testing at 1712 hours. At 1718 hours, VW2 contained 0.33-feet free product. At 1720 hours, VW1 contained no free product, depth to water (DTW) =17.36-feet BTOC; at 1735 hours DTW=17.59-feet BTOC; at 1746 hours DTW=17.68-feet BTOC; at 1801 hours DTW=17.75-feet BTOC

**Table 4 - Drop Pipe Vacuum Extraction Testing - VW-1 & VW-2**

**SITE LOCATION:** 7th & Harrison, Oakland, California

**DATE:** April 21, 1994

**EXTRACTION POINT ID#:** VW-1 & VW-2

**START TIME:** 09:15

<b>TIME MONITORED</b>	09:20	10:15	12:15	14:15	15:35	16:15
<b>TIME INTERVAL (min)</b>	5	60	180	300	380	420
<b>VACUUM ("Hg)</b>	16.2	16	16.2	16.4	16.4	16.1
<b>FLOW RATE (scfm)</b>	12	12	16	16	14	14
<b>TVH, ppm (as propane) (as gasoline)</b>	-----	24,750 5,569	24,375 5,484	24,750 5,569	24,750 5,569	24,750 5,569
<b>Sensidyne/GASTEC ppm as gasoline</b>	-----	8,000	-----	11,300	-----	6,600 8,100
<b>INFLUENCE DATA</b>	<b>Inches of Water</b>					
<b>ID#</b>	<b>Distance</b>					
MW-1	32	-----	+0.01	ND	+0.03	+0.12 +0.19
MW-2	27	-----	ND	ND	ND	ND +0.02
MW-3	70	-----	ND	ND	ND	ND +0.04
<b>Total H2O (gallons)</b>		0	14	35	50	60 66

**NOTES:** Calibrate FID at 0900, 1110 and 1538 hours. Collect replicate samples for Sensidyne/Gastec at 1615 hours.

**Table 4 cont. - Drop Pipe Vacuum Extraction Testing - VW-1 & VW-2**

**SITE LOCATION:** 7th & Harrison, Oakland, California

**DATE:** April 21, 1994

**EXTRACTION POINT ID#:** VW-1 & VW-2

**START TIME:** 09:15

<b>TIME MONITORED</b>	17:15					
<b>TIME INTERVAL (min)</b>	480					
<b>VACUUM ("Hg)</b>	15					
<b>FLOW RATE (scfm)</b>	16					
<b>TVH, ppm (as propane) (as gasoline)</b>	26,250 5,906					
<b>Sensidyne/GASTEC ppm as gasoline</b>	8,000					
<b>INFLUENCE DATA</b>	<b>Inches of Water</b>					
<b>ID#</b>	<b>Distance</b>					
MW-1	32	+0.09				
MW-2	27	+0.02				
MW-3	70	+0.10				
<b>Total H2O (gallons)</b>		73				

**NOTES:** Stop testing at 1720 hours.

**Table 5 - Drop Pipe Vacuum Extraction Testing - VW-1 & VW-2**

**SITE LOCATION:** 7th & Harrison, Oakland, California

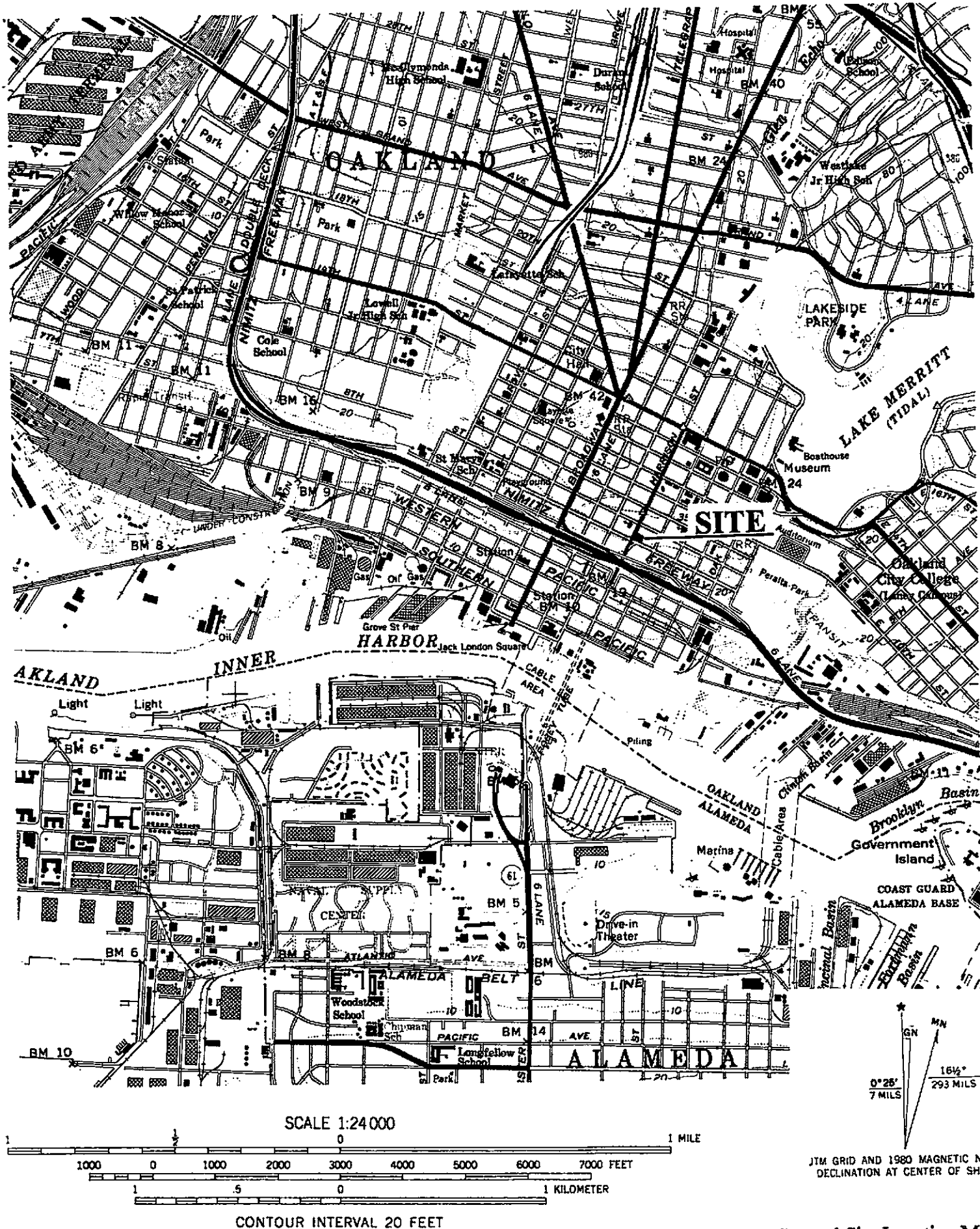
**DATE:** April 22, 1994

**EXTRACTION POINT ID#:** VW-1 & VW-2

**START TIME:** 08:15

<b>TIME MONITORED</b>		08:37	09:15	10:15	11:15	12:15	
<b>TIME INTERVAL (min)</b>		22	60	120	180	240	
<b>VACUUM ("Hg)</b>		16.5	16.3	16.2	16.2	16	
<b>FLOW RATE (scfm)</b>		11	14	16	16	16	
<b>TVH, ppm (as propane) (as gasoline)</b>		24,000 5,400	28,875 6,497	27,375 6,159	27,000 6,075	26,250 5,906	
<b>Sensidyne/GASTEC ppm as gasoline</b>		-----	6,000	-----	-----	6,300	
<b>INFLUENCE DATA</b>		<b>Inches of Water</b>					
<b>ID#</b>	<b>Distance</b>						
MW-1	32	+0.03	+0.02	-0.04	-0.04	-0.01	
MW-2	27	+0.02	ND	-0.04	-0.05	ND	
MW-3	70	ND	ND	ND	-0.005	ND	
<b>Total H2O (gallons)</b>		4	12	21	29	38	

**NOTES:** Calibrate FID at 0807 hours. Prior to testing, VW1 contained 0.02-foot free product and VW2 contained 0.1-foot free product. Collect 1-L Tedlar air bag for TPHg and BTEX laboratory analysis at 1215 hours. End testing at 1220 hours. After test, VW1 contained 0.003-foot free product and VW2 contained 0.08-foot free product. Post test groundwater levels: MW-1 = 17.16-foot BTOC, MW-2 = 18.16-foot BTOC and MW-3 = 17.58-foot BTOC.

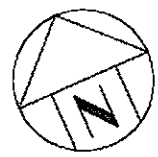
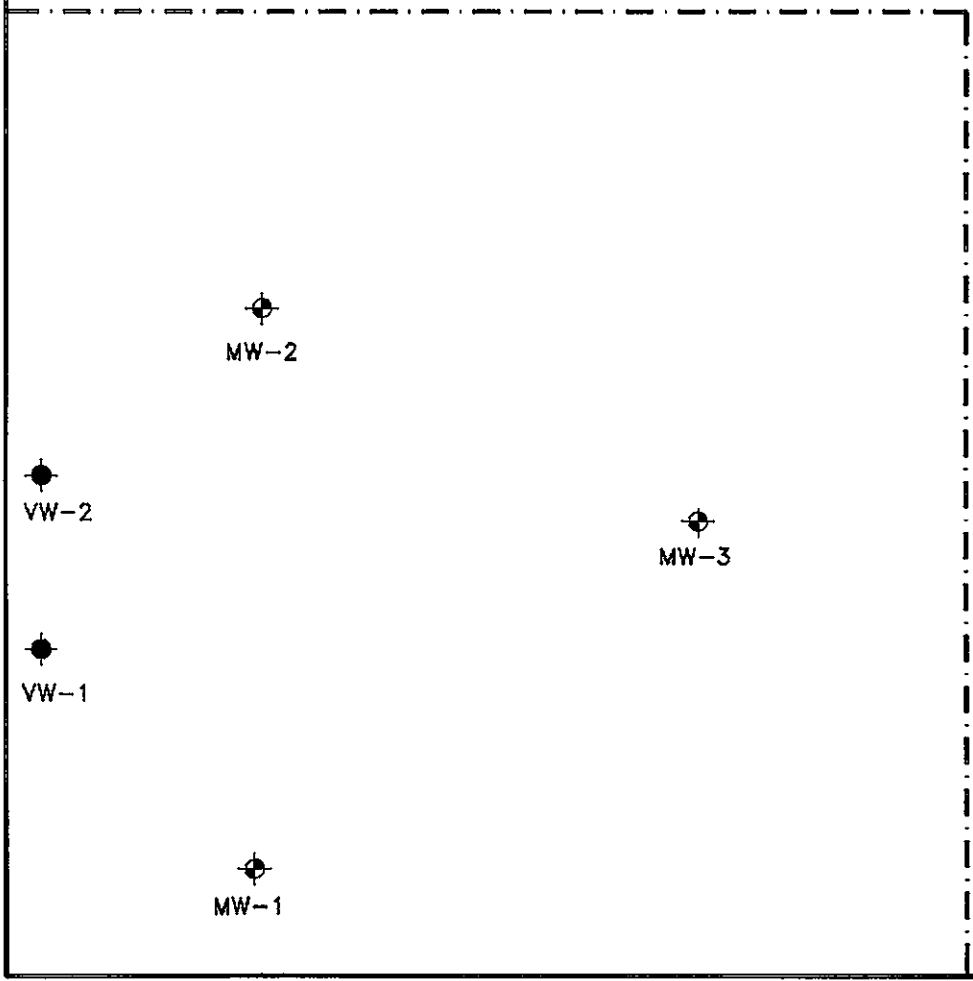


**FIGURE 1 - General Site Location Map**  
 Former Gin's Arco Site  
 7th and Harrison Streets  
 Oakland, California

↑ Unocal



Shell

HARRISON STREET



*Shell*

**LEGEND**

-  MW-1 Monitoring Well Location
-  VW-1 Vapor Recovery Well Location

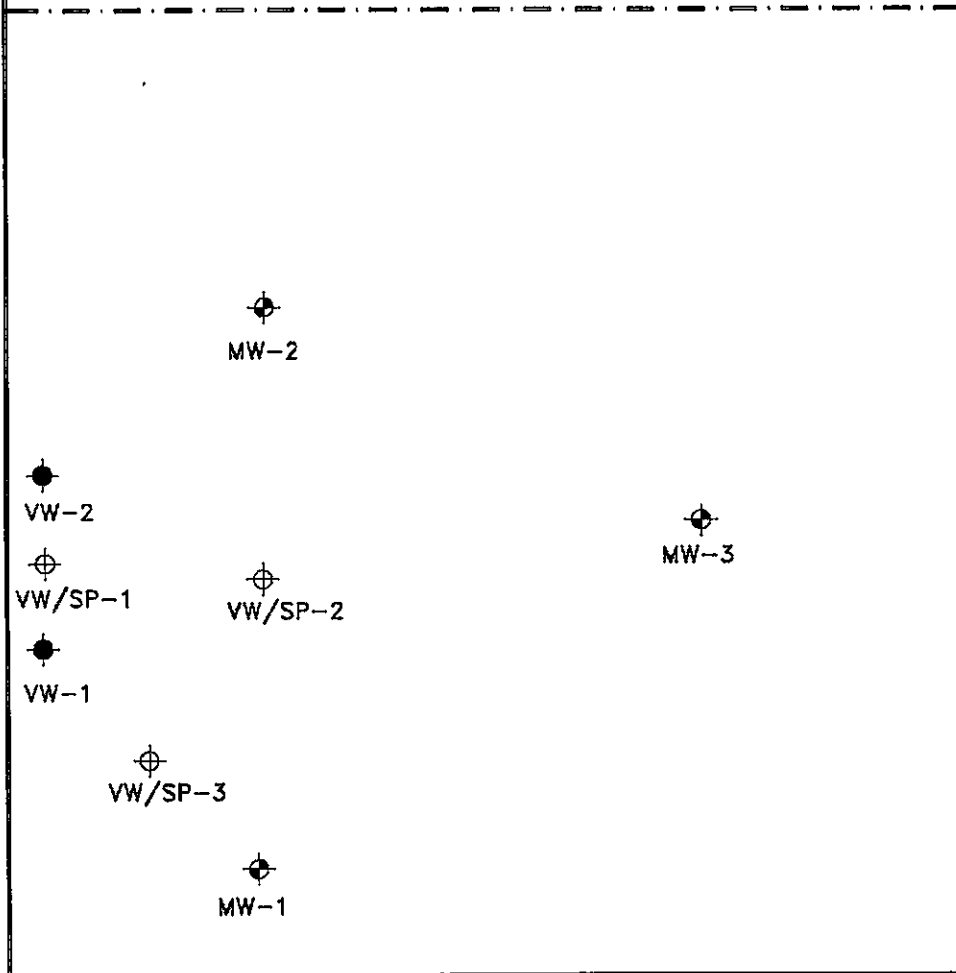
▬▬▬▬▬▬▬ Property Line

SCALE IN FEET 1" = 20'

SEVENTH STREET

<b>FIGURE 2 - Site Features</b> Former Gin's Arco Site 706 Harrison Street Oakland, California	Designed by HW/TA
	Job Number: 930747-3
<b>Remediation Testing and Design</b> 609 Pacific Avenue, Suite 201 Santa Cruz, California 95060 Phone: (408)458-1612 Fax: (408)458-1508	Rev. Date: May 24, 1994
	File Name: SITEBASE.DWG
	Sheet 1 of 1

HARRISON STREET



LEGEND



MW-1 Monitoring Well Location



VW-1 Vapor Recovery Well Location



VW/SP-3 Proposed Vapor Recovery Well/Sparge Point

--- Property Line

SCALE IN FEET 1" = 20'

SEVENTH STREET

FIGURE 3 - Proposed Well Locations  
Former Gin's Arco Site  
706 Harrison Street  
Oakland, California

Remediation Testing and Design  
609 Pacific Avenue, Suite 201  
Santa Cruz, California 95060  
Phone: (408)458-1612 Fax: (408)458-1508

Designed by: HM/TA

Job number: 930747-3

Rev. Date: May 24, 1994

File Name: SITEBASE.DWG

Sheet 1 of 1

# **APPENDIX A**



# REMEDIATION TESTING AND DESIGN

ENVIRONMENTAL      INVESTIGATION      REMEDIATION      SITE CLOSURE

609 Pacific Avenue, Suite 201, Santa Cruz, CA 95060  
Phone: (408) 458-1612 Fax: (408) 458-1509

April 12, 1994

Mr. Robert E. Cave  
Permit Services  
Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, California 94109

Subject: Notification Letter to Conduct Vacuum Extraction Feasibility Testing at: Gin's Arco at 7th and Harrison Streets in Oakland, California.

Dear Mr. Cave:

Remediation, Testing and Design (RTD) is pleased to submit the following letter regarding a "request for exemption" to conduct vacuum extraction feasibility testing (VEFT) at the above referenced Site. The duration of the VEFT field work will be one week.

## SCOPE OF WORK

RTD will conduct the following activities at the site: 1) Perform vacuum extraction feasibility testing (VEFT) and 2) submit a report of findings. This project will require one full week of field work. Exact testing details for the site may be modified based on site conditions, but will generally follow the proposed field activities described below.

### Vacuum Extraction Feasibility Testing

RTD will conduct the VEFT using the existing vapor recovery/vacuum extraction wells at the site for extraction purposes and the monitoring wells used to monitor vacuum influence. The VEFT will be conducted to determine the effectiveness of using vacuum extraction for remediation of soil and groundwater, and the removal of insoluble hydrocarbons (if present).

The VEFT will be conducted using RTDs vacuum extraction testing unit (VETU) consisting of: a Kohler 12-horsepower engine directly driving a Sutorbilt Model 3ML positive displacement blower capable of displacing 125 standard cubic feet per minute (scfm) and attainment of a vacuum load of 15 inches of mercury; a 55-gallon water accumulator to remove any vaporized water; and two granular activated carbon (GAC) canisters in series, each containing 200-pounds of vapor phase GAC. Extracted vapors will be monitored with a Beckman Model 400 Total Hydrocarbon Analyzer equipped with a flame ionization detector (FID) before the GAC canisters, between the GAC canisters, and after the second GAC unit. No appreciable hydrocarbon vapor emissions are anticipated.

Soil gasses extracted during the VEFT will be continuously field screened for total volatile hydrocarbons (TVH) using the Beckman. RTD recommends further analysis of extracted soil gasses for oxygen and carbon dioxide. DBA will supply a properly calibrated instrument capable of detecting oxygen and carbon dioxide at a range of 0 to 25 weight percent.

RTD anticipates extracting from each of the wells for a period of ten minutes each. The groundwater monitor wells (MW-1 and MW-2) will be tested briefly with and without a 1-inch diameter PVC drop pipe. Use of the drop pipe may enhance hydrocarbon extraction while reducing groundwater up welling. Vacuum extraction will be conducted for a minimum period of 12-hours (4-hours the first period, 8-hours the second period). The test will then be suspended for a 24-hour period. The second portion of the test will be for a minimum of 12-hours (8-hours the first period, 4-hours the second period). This will help in determining the rebound effect and to determine the overall effectiveness and sizing of the vapor extraction system.

Periodically during the testing, extracted soil gasses will be collected into 1-L Tedlar air bags. DBA will transport them under chain of custody documentation to a certified laboratory for analysis of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethyl benzene and total xylenes (BTEX). RTD will collect the samples and DBA will be responsible for supplying the airbags and the laboratory for analysis. RTD anticipates collecting a total of four air bag samples for laboratory analyses.

Any liquid wastes produced during the VEFT will be stored on-site in DBA supplied DOT rated 55-gallon drums.

The VEFT will be performed on the week of April 18, 1994.


#### Report Preparation

Based on the results of the field work, a report will be prepared for the site which will summarize field activities and present the results of the vacuum extraction feasibility testing. In addition to data presentation, the report will also contain RTDs conclusions and recommendations.

We fully appreciate your cooperation in expediting this request. If you have any questions or comments regarding this letter, please contact me at (408) 458-1612.

Sincerely,

#### **REMEDIATION TESTING AND DESIGN**



Howard Whitney, R.G. 4860  
Registered Geologist

cc: Dr. John Sammons, Dennis Bates Associates, Inc.  
Mr. Bo K. Gin, Oakland Auto Parts & Tires

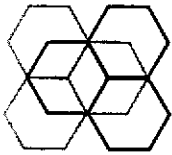
## **APPENDIX B**



Environmental & Analytical Chemistry  
 1961 Concourse Drive, Suite E, San Jose, CA 95131  
 (408) 432-8192 • Fax (408) 432-8193

# CHAIN-OF-CUSTODY RECORD

PROJECT NUMBER		PROJECT NAME				Number of Cntnrs	Type of Containers	Type of Analysis								Condition of Samples	Initial
		FORMER GIN'S ARCO VEFT															
Send Report Attention of:				Report Due		Verbal Due											
Howard Whitney				/ /		/ /											
Sample Number	Date	Time	Comp	Matrix	Station Location												
VEFT4-4	4/22/94	1215		AIR	FORMER GIN'S ARCO	1	1-L Air Bag	X	X								
<div style="border: 1px solid black; border-radius: 50%; width: 200px; height: 100px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <span style="font-size: 2em; font-weight: bold;">A/E 2339</span> </div>																	
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Date/Time		Remarks: Pls. Observe 72-hour hold time for Air Analysis COMPANY: RTD 609 Pacific Ave #201 Santa Cruz, CA 95060 ADDRESS: PHONE : 458-1612 FAX : 458-1509									
<i>[Signature]</i>		4/23/94 11:40		<i>Philip Mungy</i>		4/23/94 12:10											
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Date/Time											
Relinquished by: (Signature)		Date/Time		Received by Lab:		Date/Time											



**AN/EN Inc**

Analytical & Environmental Chemistry

04/28/94

A/E2339

HOWARD WHITNEY  
REMEDIATION TESTING AND DESIGN  
609 PACIFIC AVENUE, SUITE 201  
SANTA CRUZ, CA 95060

This is the **CERTIFICATE OF ANALYSIS** for the following samples as received.

Client Project ID: **FORMER GIN'S ARCO VEFT**  
Date Received by Lab: 04/23/94  
Total Number of Samples: 1  
Sample Matrix: **AIR**

Volatile Organics are analyzed in accordance with EPA Test Methods for Evaluating Solid Waste, (SW846), Third edition, July 1992. Method 5030 (Purge and Trap) is used for the sample preparation/introduction. Method 8010 (Halogenated Volatile Organics-GC/ELCD) or Method 8240 (Volatile Organics-GC/MS) is used for the analysis.

BTEX is analyzed in accordance with EPA Test Methods for Evaluating Solid Waste, (SW846), Third edition, July 1992. Method 5030 (Purge and Trap) is used for the sample preparation / introduction. Method 8020 (Aromatic Volatile Organics) is used for the analysis.

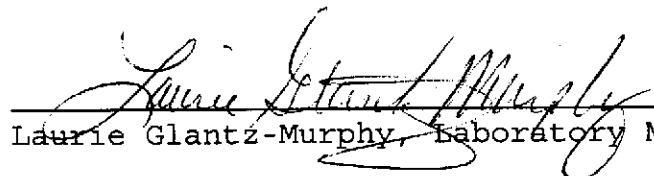
Total Volatile Petroleum Hydrocarbons (Gasoline) are analyzed in accordance with the California State Water Resources Control Board Leaking Underground Fuel Tank (LUFT) Field Manual, Last Revision October 1989. Method 5030 (Purge and Trap) is used for the sample preparation and introduction.

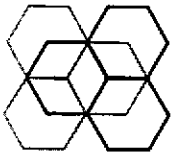
Total Extractable Petroleum Hydrocarbons (Diesel, Oil, Kerosene, Stoddard, etc.) are analyzed in accordance with the California State Water Resources Control Board Leaking Underground Fuel Tank (LUFT) Field Manual, Last Revision October 1989. EPA Method 3550 (Sonication) is used for sample extraction/preparation.

Total recoverable solvent soluble compounds (Oil & Grease) are analyzed under the guidelines of Standard Methods 18th Ed. (1992) - Method 5520 B (Partition-Gravimetric) & F (Petroleum Hydrocarbons). Solvent mixture used: 80% Hexane and 20% methyl-tert-butyl ether. Sonication is used for soil preparation.

AN/EN, Inc. is accredited by the California Department of Health Services; Certificate Number 1183, issued May 7, 1990. The DHS-Environmental Laboratory Accreditation Program can be reached at (510) 540-2800.

Reviewed and Approved:

  
Laurie Glantz-Murphy, Laboratory Manager



**AN/EN Inc**

Analytical & Environmental Chemistry

Laboratory Numbers: A/E2339

Project: **FORMER GIN'S ARCO VEFT**

Sample Matrix: **AIR**

Date Received: 04/23/94

Sample Received: Tedlar air sampling bag.

Date of BTEX/Gas Analysis: 04/23/94

Concentration in Sample expressed as ug/L.

Analyte	VEFT4-4	PQL (ug/L)
Benzene	850.	0.05
Toluene	1,800.	0.05
Ethylbenzene	290.	0.05
Xylenes <sup>1</sup>	1,300.	0.05
Gasoline <sup>2</sup>	21,000.	5.0

1 Total of the Ortho, Meta, and Para isomers.

2 Total Volatile Petroleum Hydrocarbons as Gasoline.

PQL = **P**actical **Q**uantitation **L**imit (ug/L).

ND = **N**one **D**etected at or above the PQL.

< = None detected at or above the increased PQL.