Greyhound Lines, Inc.
901 Main Street, Suite 2500
Dallas, Texas 75202

October 26, 1989

Mr. Dennis Byrne, P.E.
Hazardous Materials Specialist
Alameda County Health Care Services
Department of Environmental Health
80 Swan Way, Rm. 200
Oakland, CA 94621

Re: Phase I Site Assessment of UST Systems
Greyhound Lines, Inc. Bus Terminal
2301 San Pablo, Oakland, CA

Dear Mr. Byrne:

Thank you for your letter of September 29, 1989, the information you provided was most welcome. Per your request, I am forwarding a copy of the Phase I Site Investigation Report prepared by Brown & Caldwell on the six abandoned tank systems.

Since my earlier report to you, we have had the tank contents removed by H & H Environmental Services and we have retained Placer Tractor Service to remove the tank systems and remediate the contaminated soil. Brown & Caldwell will provide consulting engineering services for the tank removal and remediation and will prepare a report that documents the closure and remediation.

At present, the contractor and engineer are preparing and submitting the necessary closure plan/closure permit application and site safety plan. We are also evaluating the use of an on-site, mobile, thermal incineration system for processing the contaminated soils. This option would eliminate hauling of the soil and the liability associated with contaminated soil disposal at a landfill. I will keep you informed on our progress. Please contact me at (214) 744-6678 if you have any questions.

Sincerely,

GREYHOUND LINES, INC.

Vern Sorgee

Vernon Sorgee, P.E.
Director Environmental Management

enclosure

BROWN AND CALDWELL
CONSULTING ENGINEERS

June 22, 1989

Vernon H. Sorgee, P.E.
Director of Environmental Management
Greyhound Lines, Inc.
901 Main Street, Suite 2525
Dallas, Texas 75202

4529-01/1

Subject: Phase I Investigation, Oakland, California Terminal

Dear Mr. Sorgee:

In accordance with the terms of the engineering agreement between Greyhound Lines, Inc.(Greyhound) and Brown and Caldwell Consulting Engineers (BC), dated March 16, 1988 and authorization granted under Purchase Order No. 357498, dated May 16, 1989, BC conducted a preliminary (Phase I) site investigation of 6 underground storage tanks (USTs) at Greyhound's Oakland, California Bus Terminal. This report includes project objectives, geologic and hydro-geologic setting, field investigation methods, laboratory analysis results, conclusions, and recommendations.

Site Background

Figure 1 presents the location of the Greyhound Bus Terminal (Site) in Oakland, California. The Site is located at 2103 San Pablo Avenue; the back of the terminal, where the USTs are located, faces Castro Street. Formerly Greyhound maintained 6 USTs for fueling buses. The locations of these 6 USTs are presented on Figure 2. Five of the tanks range in volume from 550 to 1000 gallons and are made of steel. The sixth tank is also steel but its dimensions could not be measured because of a drop pipe within the UST. The USTs reportedly contained either diesel or gasoline and have not been in operation for the past 30 years. Five of the USTs contain what is probably degraded diesel fuel and water.

Project Objectives

Based on a site visit conducted on April 26, 1989 with Mr. Vernon Sorgee, BC developed a list of objectives for the Phase I investigation. The objectives of this investigation were:

1. Determine the contents of the tanks;

2. Determine if hydrocarbon residues exist in the soil beneath the site as a result of leaks or overspills from the tanks;

MAILING: POST OFFICE BOX 8045 WALNUT CREEK, CALIFORNIA 94596-1220
STREET: 3480 BUSKIRK AVENUE PLEASANT HILL, CALIFORNIA 94523-4342 • (415) 937-9010 • FAX: (415) 937-9026

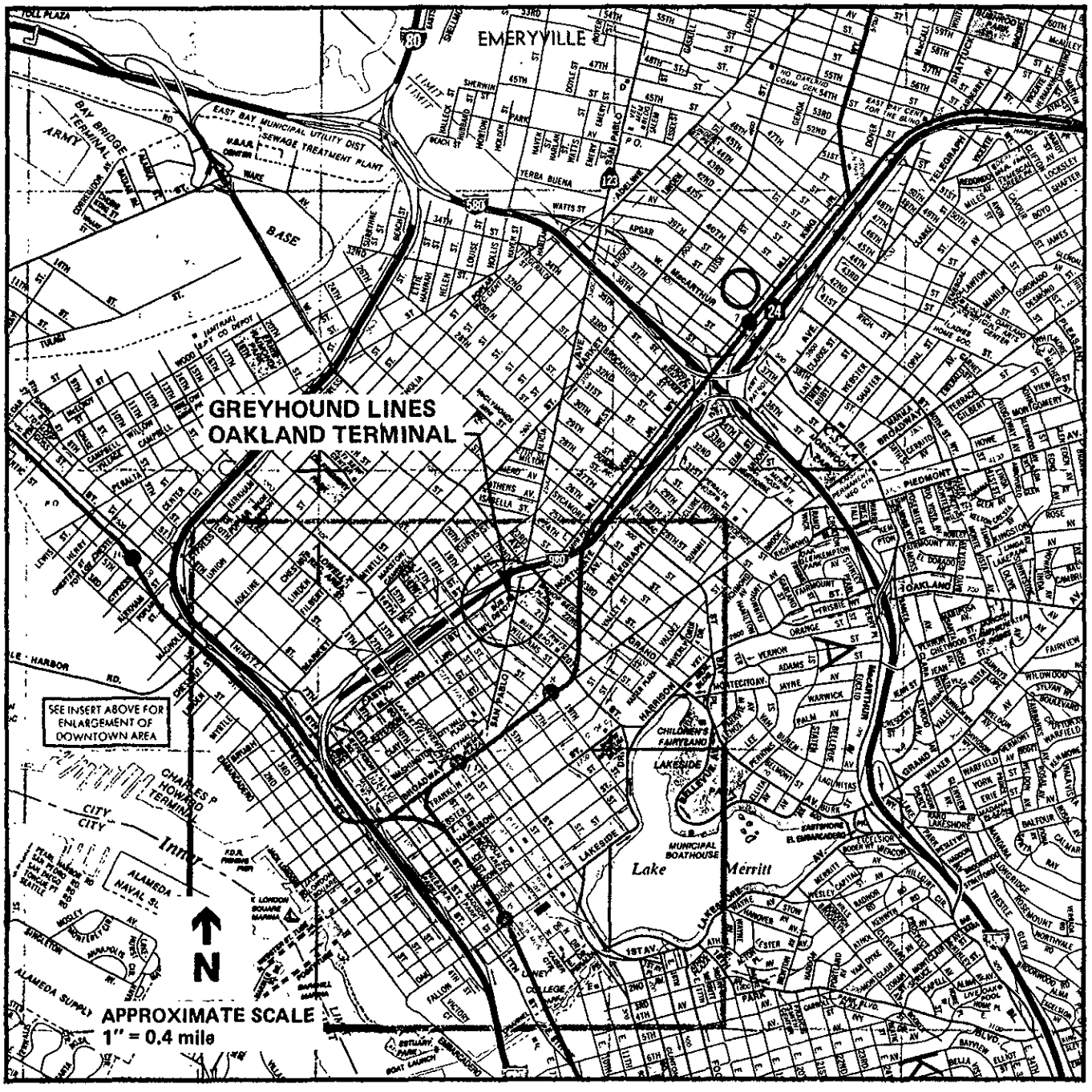
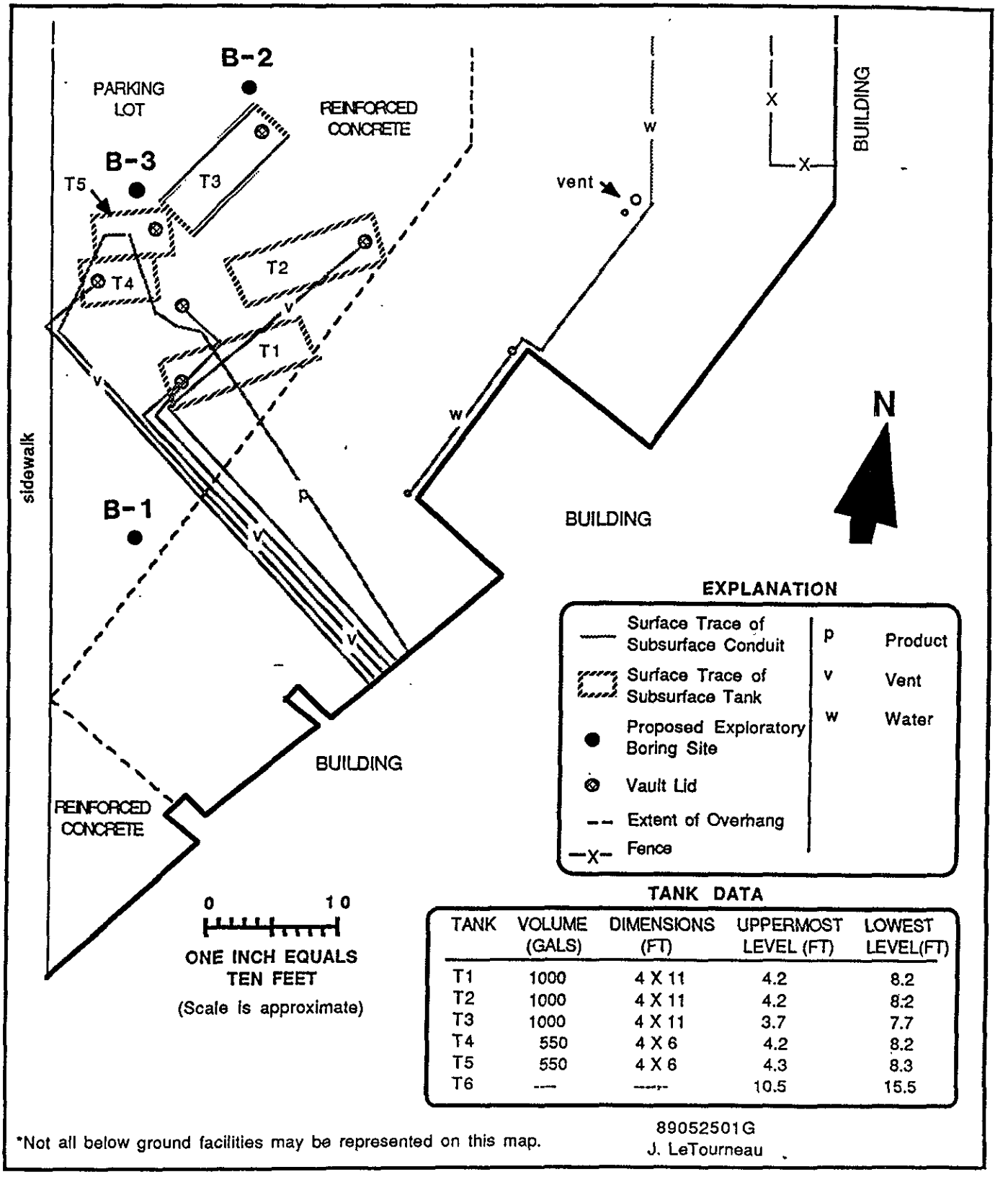


Figure 1 Location Map



TANK	VOLUME (GALS)	DIMENSIONS (FT)	UPPERMOST LEVEL (FT)	LOWEST LEVEL(FT)
T1	1000	4 X 11	4.2	8.2
T2	1000	4 X 11	4.2	8.2
T3	1000	4 X 11	3.7	7.7
T4	550	4 X 6	4.2	8.2
T5	550	4 X 6	4.3	8.3
T6	---	---	10.5	15.5

Figure 2 Site Plan

3. Provide recommendations for tank closures;

4. Provide a letter report describing the findings of the Phase I investigation.

Geologic and Hydrogeologic Setting

The Oakland Bus Terminal lies approximately 1 1/4 miles northeast of the Alameda Estuary, in the eastern central portion of San Francisco Bay. Land surface elevation at the site is approximately 25 feet above mean sea level.

A highly variable sequence of clays, silts and sands of low to moderate permeability underlie the site. The principal water-bearing units in are found in discontinuous sand lenses and stringers within the silt and clay units. The depth to groundwater beneath the site is approximately 20 feet.

Cultural Features

The site is located within Oakland's central business district, which is predominantly commercial. Interstate highway 980 is located across Castro Street and northwest of the site. San Pablo Avenue is the main north-south thoroughfare in this area. The district within 3 blocks of the site is occupied by various businesses, churches, residences, and city streets.

Field Investigation

On April 26, 1989, during a site visit with Mr. Vernon Sorgee, six UST fill pipes were noted. However, the fill pipe caps could not be removed to measure the UST contents.

On May 26, 1989, Spectrum E.S.I. conducted a site survey of the USTs under the supervision of BC. The purpose of this survey was to determine the number, size, depths, and orientations of the USTs and associated piping, and to select locations for boreholes in the immediate vicinity of the tank cluster. The confirmed locations of 5 of the 6 USTs and the three selected borehole locations are noted on Figure 2.

At the same time as the UST survey, BC collected samples from the residual UST liquids. BC collected samples by lowering a teflon bailer with a foot valve into the tank. Two 40 milliliter (ml) vials were filled from the foot valve. Teflon caps were placed on the vials such that there was no headspace; the samples were immediately placed in a chilled cooler.

Tank T-1 is 4 feet in diameter, 11 feet in length, and has a volume of 1,000 gallons. T-1 had approximately 1.3 feet of hydrocarbon product which was clear orange to rust color and viscous.

Tank T-2 is also 4 feet in diameter, 11 feet in length, and has a volume of 1,000 gallons. T-2 had 3 to 4 inches of water with 1 inch of floating product which appears to be diesel fuel.

Tank T-3 has the same dimensions and volume as T-1 and T-2 and had approximately 8 inches of dark red product.

Tank T-4 is 4 feet in diameter, 6 feet in length, and has a volume of 550 gallons. T-4 had about 1 inch of liquid. There was not enough liquid to collect a sample with the bailer. The liquid was rust-brown and oily with a strong diesel fuel odor.

Tank T-5 has the same dimensions and volume as T-4 and had approximately 2 inches of water and product. Spectrum indicated that Tanks T-4 and T-5 are probably linked together in series. The vent lines are manifolded together and the probe used to determine the internal dimensions of the tanks could enter T-5 from the fill pipe of T-4.

The true orientation and dimensions of tank T-6 could not be ascertained because of the possible presence of a welded drop pipe extending into the tank. Spectrum speculates three possible configurations for Tank T-6. These three possible tank orientations are presented on Figure 3.

Configuration A assumes the tank has a welded drop pipe which extends to a depth of 10.5 feet. The drop pipe extends inside the tank an unknown distance. The tank may be as much as 12 feet in diameter, assuming the top is 3 feet below grade. If the tank has a this configuration, the long dimension probably runs toward the street, in the same direction as T-2.

Configuration B assumes the tank is a deep burial UST with the top of the tank at 10.5 feet and the base at 15.5 feet below grade. The diameter would be 5 feet in diameter and it may lie beneath Tanks T-4 and T-5.

Configuration C assumes the long axis of tank is oriented vertically. This could explain the depth of the base of the tank and how it could fit in between the other tanks.

T-6 had a minimum of 3 feet of product which was dark rust to black and had very degraded appearance. This product was floating on about 1 foot of water.

The bottoms of tanks T-1 through T-5 are approximately 8 feet below grade level. The bottom of UST T6 is 15.5 feet below grade. All six tanks are covered by a reinforced concrete pad. Vent lines for five of the USTs run up the outside of the building near the former location of the pump island.

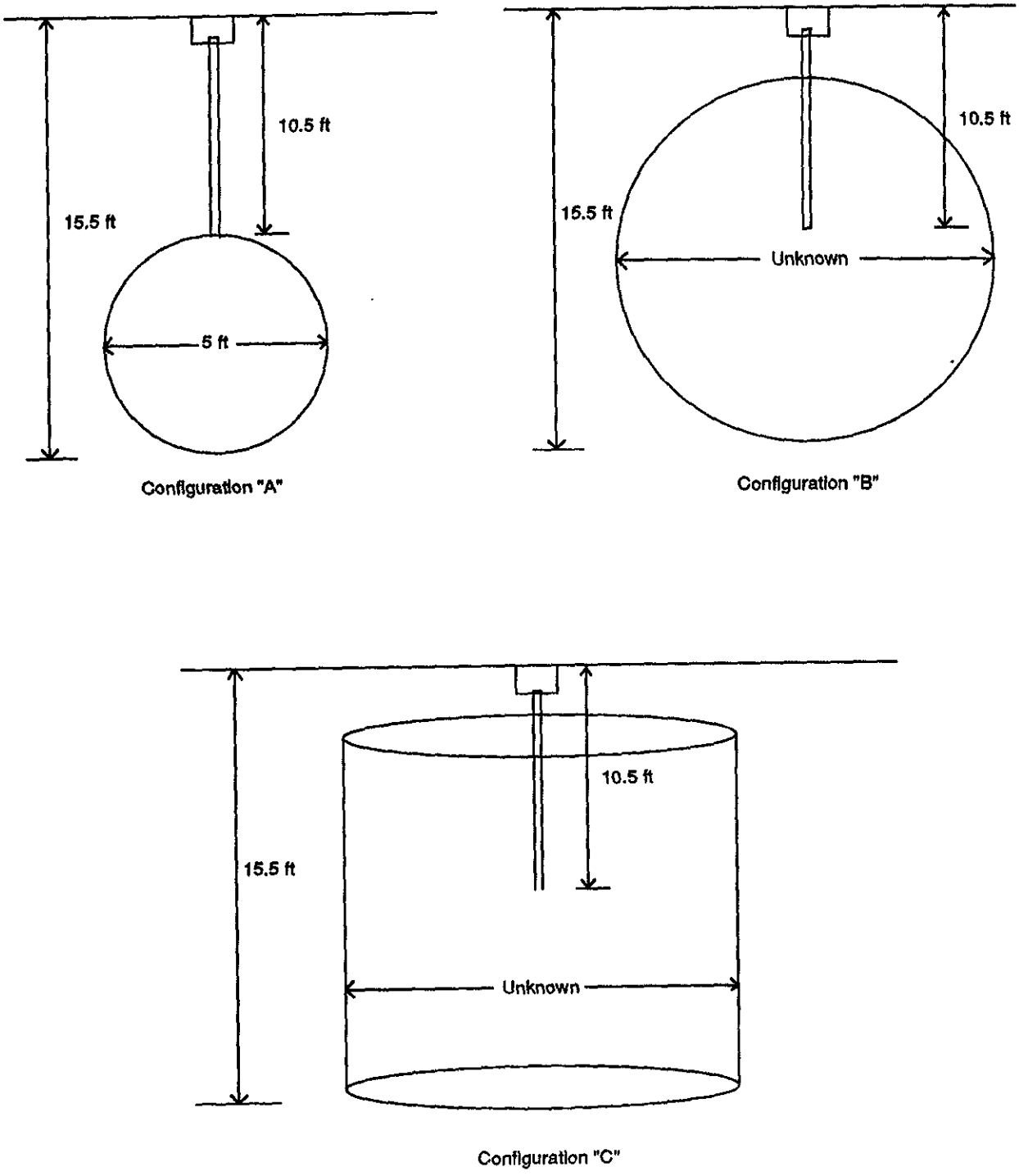


Figure 3. Possible Orientations of Tank T-6

On June 7, 1989, four 10-inch diameter cores were cut through the 7-inch thick reinforced concrete pad in the vicinity of the USTs by Herold Concrete Sawing. On June 8, 1989, 3 soil boreholes were drilled (BC-1, BC-2, and BC-3) by Aquifer Science Engineers under the supervision of BC using a Mobile B-61 hollow-stem auger drilling rig and 8-inch diameter augers.

Borehole BC-1 is located south of the tank cluster. This borehole initially encountered 14 feet of clayey sand to sandy clay. A fine to medium-grained sand was encountered from 14 feet to the termination of the borehole at 25 feet. Groundwater was encountered at approximately 22 feet. Soil samples were collected from intervals of 16.0-16.5 ft and 25.0-25.5 ft using a modified California sampler equipped with 3 brass tubes which were each 2-inches in diameter and 6-inches long. One tube from each sampled interval was capped, securely sealed, labeled, and preserved on ice until submitted to the laboratory under chain-of-custody procedures. Soils were monitored continuously for combustible vapors during the drilling of this borehole with a Bacharach TLV Sniffer. Background values for the TLV Sniffer were established at 0 parts per million (ppm) prior to drilling activities. Sniffer readings of the soils from BC-1 ranged from 38 ppm at 6.5 ft to 520 ppm at 20 ft. There was an especially heavy hydrocarbon odor associated with the sandy soil below 14 ft.

Borehole BC-2 is located north of the tank cluster. This borehole initially encountered 9 feet of sandy clay. A medium-grained sand was encountered from 10 ft to the termination of the borehole at 25 feet. Groundwater was encountered at approximately 22 feet. Soil samples were collected from intervals of 16.0-16.5 ft and 26.0-26.5 ft. TLV Sniffer readings ranged from 12 ppm at 6.5 ft to 560 ppm at 16.5 ft.

Borehole BC-3 is located northwest of the tank cluster. This borehole initially encountered 2 feet of sand which had a strong hydrocarbon odor. A silty to sandy clay was observed from 4 to 14 feet and the medium-grained sand was again logged from 14 to the termination of the borehole at 25 ft. Groundwater was encountered at approximately 22 feet. Soil samples were collected from intervals of 16.0-16.5 ft and 25.0-25.5 ft. TLV Sniffer readings ranged from 140 ppm at 7 ft to 4400 ppm at 15.5 ft.

Borehole logs with more complete descriptions of the geologic conditions encountered are included as Attachment A. Upon completion of drilling, the boreholes were backfilled with soil cuttings and the cement cores were placed over the boreholes at the surface. Samples were sent under chain-of-custody procedures via priority air freight to Southern Petroleum Laboratories (SPL) in Lafayette, Louisiana for 48 hour turnaround analysis. The chain-of-custody form is included in Attachment B.

Laboratory Analysis and Results

UST Liquid Samples. Five UST liquid samples were analyzed by SPL for benzene, toluene, xylene, and ethylbenzene (BTXE) by EPA Method 602. Results of the liquid analyses are presented below in Table 1. Complete UST liquid laboratory reports are included in Attachment C.

Table 1. UST Liquids Laboratory Results

		Concentration in parts per million (ppm)			
Tank	Sample	Benzene	Toluene	Xylene	Ethylbenzene
T-1	O-2	86.1	231	663	100
T-2	O-1	26.1	42.7	49.8	7.5
T-3	O-5	3,730	8,110	16,700	3,730
T-4	O-6	NS	NS	NS	NS
T-5	O-4	7.16	78.2	285	42.6
T-6	O-3	137	5.99	980	155

Mr. John Trahan of SPL indicated that T-1 and T-6 contain #2 diesel fuel. The gas chromatograph response for T-2 indicated the sample contains gasoline, water, and diesel fuel. T-3 contains degraded #1 diesel fuel with some water. T-5 contains mostly #2 diesel but also some #1 diesel and water.

Soil Samples. Six soil samples were analyzed by SPL for benzene, toluene, xylene, and ethylbenzene (BTXE) by EPA Method 8020, for total petroleum hydrocarbons (TPH) by EPA Method 418.1, and for total fuel hydrocarbons (TFH) by Modified EPA Method 8015. Results of the soil analyses are presented below in Table 2. Complete soil laboratory reports are included in Attachment C.

Table 2. Soil Laboratory Results

			Concentration in parts per million (ppm)			
Sample/Depth	TPH	TFH	Benzene	Toluene	Xylene	Ethylbenzene
BC-1/16.0-16.5	11.300	3,060	NR	1.780	1.130	37.500
BC-1/25.0-25.5		<10	<10	<0.001	0.008	0.027
BC-2/16.0-16.5	13.200	4,260	NR	4.000	2.000	49.500
BC-2/26.0-26.5		<10	<10	0.090	0.154	0.402
BC-3/16.0-16.5	6.990	1,850	NR	2.240	1.030	28.900
BC-3/25.0-25.5	<0.001	<10	<10	<0.001	<0.001	0.008

Note: NR - Interpretation of results not possible. See below.

TLV Sniffer measurements and soil samples results from boreholes BC-1, BC-2, and BC-3 yield the highest hydrocarbon concentrations at a depth of 16.0-16.5 feet. The bottom of the USTs is 8 feet to 15.5 feet below grade. These results suggest that there has been an uncontrolled release from one or more of the USTs.

Interpretation of the TFH analyses for the soil samples from the 16.0-16.5 foot interval was difficult. The product had degraded significantly and matching its "fuel fingerprint" with that of known compounds was not possible. However, since the TPH and BTXE analyses indicate that there is significant contamination of the soil at this depth, the TFH results are not critical to this investigation.

Alameda County Health Department guidelines call for further investigation of a site exhibiting concentrations of TPH or TFH greater than 100 ppm as an uncontrolled release.

Quality Assurance/Quality Control Analyses

The validity of the laboratory analyses performed for this project is verified through three quality assurance/quality control procedures.

Laboratory control standards (LCS) are organic-free deionized water, also called blanks. Analysis of a blank provides a check of the laboratory instruments to determine if the reagents have been contaminated or if contamination of the instruments from previously analyzed samples is present. The analysis of a blank for TPH by EPA Method 418.1 yielded no detectable TPH and meets QA/QC requirements.

Batch duplicates are aliquots of a sample subjected to the same preparation and analytical scheme as the original sample. Analysis of duplicate aliquots of a TPH sample did not yield a detectable concentration (<10 ppm) for either aliquot. This is within the acceptable limits for analytical precision.

A matrix spike is an LCS to which a known amount of an analyte is added. These standards are then subjected to the same sample preparation or extraction and analyzed in the same manner as the field samples.

The percent recovery is a comparison of the measured spike as a percent of the theoretical spike. Low percent recoveries (below 100 percent) indicate the matrix has retained a portion of the compound. In soil samples this would indicate compounds adsorbed to the soil matrix. High recoveries (above 100 percent) indicate the matrix is adding to the analysis. The relative percent deviation (RPD) compares the average analyte concentration with their difference. Thus the smaller the RPD the closer the concentration of the measured sample is to its theoretical value.

The original known concentration of a sample prepared in the laboratory for TPH analysis was 0 ppm which is below the method detection limit of 10 ppm. A spike of 100 ppm was added to the sample thus the theoretical concentration was 100 ppm. The measured concentration of the spiked sample was 96 ppm, indicating a method recovery of 96%. This is within acceptable limits.

BTXE spikes were added to known soil sample concentrations. The spiked samples were analyzed by EPA Method 8020. All percent recoveries and RPDs except for one fall within acceptable limits. The exception is a toluene spike of 50 micrograms/liter (ug/l) which was added to a known concentration of 34 ug/l. The percent recovery was 68% and the RPD was 21 which is one point above the tolerance limit for this analysis. The QA/QC laboratory reports are included as Attachment D.

Conclusions

The following conclusions are based upon the results of this Phase I field investigation and laboratory testing program:

1. Native soils encountered during the sampling of 3 boreholes consisted primarily of clays, silts, and sands. Clays and silts were predominant to a depth of 9 to 14 feet. Medium to fine-grained sands were encountered below the silts and clays to a depth of 26 feet.

2. Groundwater was encountered at a depth of approximately 22 feet below ground surface.

3. Hydrocarbon concentrations in the tank liquids indicate the USTs contain #1 or #2 diesel. Water is also present in some tanks.

4. The TLV Sniffer readings and soil sample analyses suggest that one or more of the USTs have leaked or that overflows or spills to the USTs have occurred in the past.

Recommendations

We understand that Greyhound wishes to abandon the tanks by excavation and removal. The following recommendations are presented regarding methods for closure:

1. File an Underground Storage Tank Unauthorized Release Report with the Alameda County Department of Environmental Health and the San Francisco Bay Regional Water Quality Control Board. A copy of this reporting form was sent to you previously.

2. Pump out liquids remaining in the tanks using a vacuum truck. The names of 3 licensed operators were provided to you previously.

3. File closure permits with both the Alameda County Department of Environmental Health and the City of Oakland Fire Prevention Bureau. These permits are included as Attachment E. The permits require submittal of a site safety plan, the identification of the rinsate transporter, tank excavation contractor, tank transporter, contaminated soil transporter, sample collector, analytical laboratory, and application or inspection fees.

4. File a site investigation work plan to the Alameda County Department of Environmental Health and the San Francisco Bay Regional Water Quality Control Board which will address the approach and methods to delineate the lateral and vertical extent of soil and groundwater contamination. This plan will include the installation and sampling of at least 3 shallow groundwater monitoring wells.

5. Send a notification form to the Bay Area Air Quality Management District notifying them at least 5 days prior to removal of the tanks.

6. Remove the concrete slab and expose the top of the tanks.

7. Add dry ice to the tanks to purge all flammable vapors. The fire department inspector will test the tank vapors with a sniffer to ensure that vapors are below the lower explosive limit (LEL).

8. If no manway exists, saw a hole into USTs after receiving fire department approval. Triple rinse tanks and product lines pursuant to Alameda County requirements. The final rinse must contain less than 100 ppm of TFH (EPA Method 602) or TPH (EPA Method 418.1). The interiors of the USTs must be free from deposits or residues upon a visual examination of the tank by the fire inspector.

9. Excavate the tank and associated product lines and have them certified clean by the fire inspector. Properly label the tank with the name and address of the contractor and display a notice "triple rinsed; laboratory certified analysis available upon request". Haul USTs away for appropriate disposal.

11. Excavate and properly dispose of soils with TFH or TPH concentrations greater than 100 ppm or to a depth of 22 feet, whichever comes first. These soils must be transported under a Uniform Hazardous Waste Manifest that

must be signed by the Greyhound Lines, Inc. or their authorized agent.

12. Upon completion of each soil excavation, collect 2 soil samples from the base of the excavation and from every 20 lineal feet of product line trench to verify that contaminated soil has been removed. Analyze for TPH by EPA Method 418.1, TFH by Modified EPA Method 8015, and BTXE by EPA Method 8020. If groundwater is encountered, collect a sample and analyze for TPH by EPA Method 418.1, TFH by Modified EPA Method 8015 and BTEX by EPA Method 602.

13. Prepare a closure/soil remediation report detailing closure procedures, soil disposal activities, and laboratory results. Submit report to the Alameda County Department of Environmental Health, San Francisco Bay Regional Water Quality Control Board and the City of Oakland Fire Prevention Bureau.

This completes the scope of services for this Phase I investigation. We are prepared to begin tank closure/soil remediation and site investigation activities (Phase 2) at your request. If you have any questions or comments please call us at your convenience.

Very truly yours,

BROWN AND CALDWELL

Tim D. Cook
Project Manager

Denis M. O'Malley
Principal-in-Charge

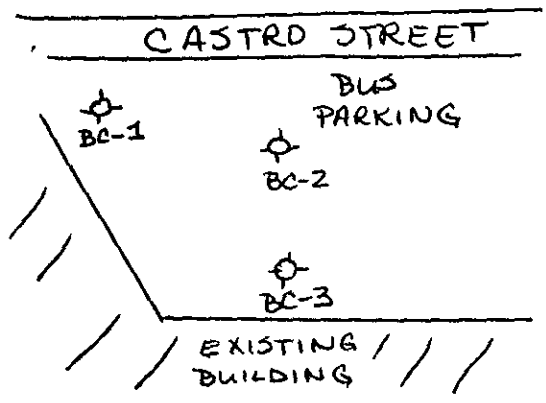
TDC:

Attachments (5)

ATTACHMENT A

BOREHOLE LOGS

LOCATION OF BORING



CLIENT	Western Greyhound Lines
LOCATION	Oakland
JOB NO.	4529-01
BORING NO.	BC-1
SHEET	1 OF 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLING START TIME	0844
DRILLING FINISH TIME	0934
DRILLING START DATE	6/8/89
DRILLING FINISH DATE	6/8/89
DRILLING CONTRACTOR	A. S. E.
DRILLING METHOD	8" Hollow Stem Augers
SAMPLING METHOD	Cal. mod. 2", 140#/30" in (cm)

DRILLER Chris St. Pierre RIG Mobile Drill B-61

BY D. Covington DATE 6/8/89 CHK'D BY

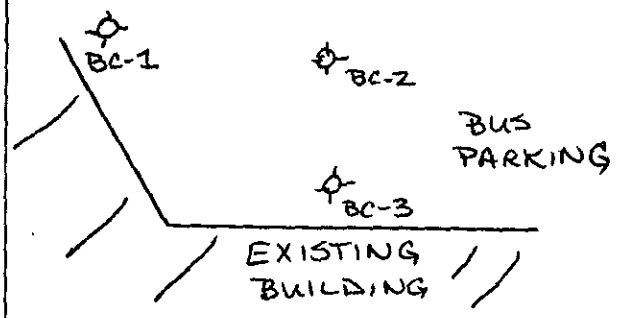
N/S E/W ELEV.

SURFACE CONDITIONS asphalt + concrete parking lot

WELL CONST. CASING	WELL CONST. ANNULUS	SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	SAMPLE NO. / SAMPLE DEPTH	BLOWS/6" SAMPLER	DEPTH IN FEET	SOIL CALLOUT	MATERIALS ENCOUNTERED AND DRILLING CONDITIONS
	Backfilled with cuttings					0		0-0.5' - CONCRETE
						1		0.5'-1.5' - clayey sand and gravel, gray, moist, strong hydrocarbon odors
						2		1.5'-4.0' - silty sand and gravel, dk. olive to gray, damp, loose TLV = 1160 ppm
						3		
						4		4.0'-6.5' - sandy clay, medium tan, damp, slightly plastic, soft, TLV@~4' = 120 ppm
						5		
						6		
						7		6.5'-14' - sandy clay, greenish-gray, damp, highly plastic, soft, TLV@~6.5' = 38 ppm TLV@~10' = 220 ppm
						8		
						9		
						10		
						11		
						12		
						13		
						14		14'-15' - silty med. sand, brown to rust, damp, loose, TLV = 40 ppm
		CM			9/15	15		15'-25' - sand, gray-brown with rust staining, damp, loose, trace silt, fine to med.-grained TLV@ 15.5' = 400 ppm
					27	16		TLV@ 20' = 520 ppm
						17		wet @ ~22'
						18		
						19		T.D = 25'
						20		
						21		
						22		
						23		
						24		
		CM			27	25		

LOCATION OF BORING

CASTRO ST.



CLIENT	Western Greyhound Lines
LOCATION	Oakland
JOB NO.	4529-01
BORING NO.	BC-2
SHEET	1 OF 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLING START TIME	1005
DRILLING FINISH TIME	1050
DRILLING CONTRACTOR	A.S.E.
DRILLING METHOD	8" Hollow Stem Augers
DRILLING START DATE	6/8/89
DRILLING FINISH DATE	6/8/89
SAMPLING METHOD	Cal. Mod. 2", 140#/30in. (cm)

DRILLER Chris @T. Pierre RIG Mobile Drill B-53

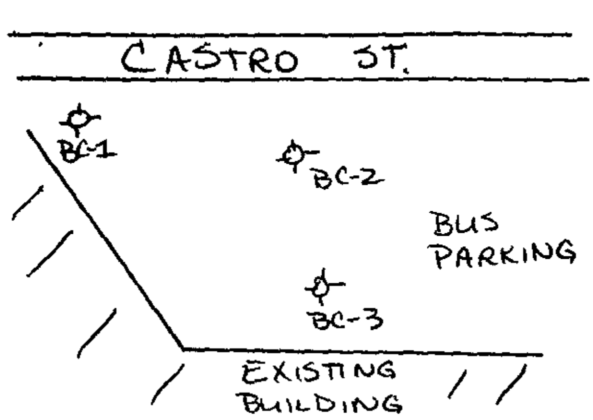
BY D. Covington DATE 6/8/89 CHK'D BY

N/S E/W ELEV.

SURFACE CONDITIONS asphalt + concrete parking lot

WELL CONST. CASING	WELL CONST. ANNULUS	SAMPLER TYPE	INCHES DRIVEN / INCHES RECOVERED	SAMPLE NO. / SAMPLE DEPTH	BLOWS/6" SAMPLER	DEPTH IN FEET	SOIL CALLOUT	MATERIALS ENCOUNTERED AND DRILLING CONDITIONS
						0		concrete
						1		gravelly sand + clay
						2		1.0'-4.0'- sandy clay, olive green, damp, high plasticity, vy. soft, trace gravel
						3		
						4		4'-6.5'- sandy clay, med. tan to brown, damp, soft, high plasticity, TLV = 180 ppm
						5		6.5'-9.0'- sandy clay, gray-green, soft, high plasticity, TLV@ 6.5' = 12 ppm, TLV@ 9' = 28 ppm
						6		
						7		
						8		9'-10'- as above with increase in sand content
	Backfilled with cuttings					9		
						10		10'-14'- sand, orange to dk. rust, damp, loose, medium-grained, trace silt
						11		
						12		14-25' above with color change to gray
						13		
						14		TLV@ 16.5' = 560 ppm, TLV@ 24' = 380 ppm
						15		saturated @ ~22'
		CM			7/16/26	16		
						17		
						18		
						19		
						20		
						21		
						22		
						23		
						24		
		CM			15/24/50(5")	25		T.D. = 25'

LOCATION OF BORING



CLIENT	Western Greyhound Lines
LOCATION	Oakland
JOB NO.	4529-01
BORING NO.	BC-3
SHEET	1 OF 1
WATER LEVEL	
TIME	
DATE	
CASING DEPTH	
DRILLING CONTRACTOR	A.S.E.
DRILLING METHOD	8" Hollow Stem Augers
SAMPLING METHOD	Cal. mod. 2", 140#/30in (cm)

DRILLING	START	FINISH
TIME	1220	1308
DATE	6/8/89	6/8/89

DRILLER Chris St. Pierre
RIG mobile Drill B-61
BY D. Cunnington
CHK'D BY
DATE 6/8/89

N/S | E/W | ELEV.

SURFACE CONDITIONS asphalt + concrete parking lot

WELL CONST.: Backfilled with cuttings

SAMPLER TYPE	BLOWS/6" SAMPLER	DEPTH IN FEET	MATERIALS ENCOUNTERED AND DRILLING CONDITIONS
		0	concrete
		1	sand + gravel, gray, dry, loose
		2	1.5'-2' - sand, dk. brown, damp, loose, strong hydrocarbon odor
		3	2'-4' - silty clay, dk. olive green, damp, soft, high plasticity TLV= 300 ppm
		4	
		5	4'-6.5' - silty clay, lt. gray, damp, less odor than above
		6	
		7	6.5'-14' - sandy clay, olive green, damp, soft, high plasticity TLV @ ~7' = 140 ppm
		8	
		9	14'-25' - sand, rust to brown, damp, wet at ~22', loose, medium-grained,
		10	
		1	TLV @ 14' = 110 ppm TLV @ 15.5' = 4400 ppm
		2	
		3	T.D. = 25'
		4	
cm	11 / 18 / 27	15	
		6	
		7	
		18	
cm	25 / 50	25	
		26	

ATTACHMENT B

CHAIN OF CUSTODY FORM

Southern Petroleum Laboratories, Inc.
104 Guilbeau Road
Lafayette, Louisiana 70506
(318) 984-2374

Analysis Request and Chain of Custody Record

Project No.	Client/Project Name	Project Location
4529	Tim Cook / Greyhound Oakland	Oakland, CA

Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Matl)	Sample Type (Liquid, Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
O-1	5/26	✓		VOA	liquid	NONE	418.1 and mod 8015 + BTXE	product samples
O-2	"	✓		"	"	"	"	"
O-3	"	✓		"	"	"	"	"
O-4	"	✓		"	"	"	"	"
O-5	"	✓		"	"	"	"	"

Samplers: (Signature)	Relinquished by: (Signature)	Date: 5/30/89 Time: 1126	Received by: (Signature)	Date: Time:	Intact
Donna Cowart	Tim Cook				
Affiliation: Brown & Caldwell	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact
	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact
SAMPLER REMARKS:			Received for laboratory: (Signature)	Date: Time:	Laboratory No.
Seal #			Date Results to:		

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JUN 09 '89 12:35

Southern Petroleum Laboratories, Inc.
104 Guilbeau Road
Lafayette, Louisiana 70506
(318) 984-2374

Analysis Request and Chain of Custody Record

Project No.	Client/Project Name	Project Location
4529-01	T. Cook / Greyhound Oakland	Greyhound Oakland

Field Sample No./ Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid, Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
BC1 (16'-16.5')	6-8-89	✓		2" x 6" brassliner	Soil	None	8020 (BTEX); Mod 8015; 418.1	
BC1 (25'-25.5')								Hold don't analyze
BC2 (16'-16.5')							" "	
BC2 (26'-26.5')								Hold
BC3 (16'-16.5')							" "	
BC3 (25')								Hold

Samplers: (Signature)	Relinquished by: (Signature)	Date: 6/8/89 Time: 1550	Received by: (Signature)	Date: Time:	Intact
Donald Smith	Tim Cook				
Affiliation	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact
	Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Intact

SAMPLER REMARKS: Analyze 3 samples @ 16'
Hold 25' samples

Seal #

Received for Laboratory: (Signature) [signature] Date: 6/9/89 Time: 10:20am

Data Results to:

Laboratory No.

JUN 13 '89 11:22

P.0

ATTACHMENT C

LABORATORY REPORTS

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0531814

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-09-89

Project:	4529
Site:	GREYHOUND, OAKLAND CA
Sample No:	0-1
Sample of:	WATER
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	5-26-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-2-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/L)	DETECTION LIMIT (UG/L)
BENZENE Method-602	26100	1
ETHYL BENZENE Method-602	7500	1
TOLUENE Method-602	42700	1
XYLENE Method-602	49800	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0531815

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-09-89

Project:	4529
Site:	GREYHOUND OAKLAND, CA
Sample No:	0-2
Sample of:	WATER
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	5-26-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-2-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/L)	DETECTION LIMIT (UG/L)
BENZENE Method-602	86100	1
ETHYL BENZENE Method-602	100000	1
TOLUENE Method-602	231000	1
XYLENE Method-602	663000	1

ND - Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0531816

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-09-89

Project:	4529
Site:	GREYHOUND OAKLAND, CA
Sample No:	0-3
Sample of:	WATER
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	5-26-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-2-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/L)	DETECTION LIMIT (UG/L)
BENZENE Method-602	137000	1
ETHYL BENZENE Method-602	155000	1
TOLUENE Method-602	5990	1
XYLENE Method-602	980000	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0531817

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-09-89

Project:	4529
Site:	GREYHOUND OAKLAND, CA
Sample No:	0-4
Sample of:	WATER
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	5-26-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-2-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/L)	DETECTION LIMIT (UG/L)
BENZENE Method-602	7160	1
ETHYL BENZENE Method-602	42600	1
TOLUENE Method-602	78200	1
XYLENE Method-602	285000	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0531818

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-09-89

Project:	4529
Site:	GREYHOUND OAKLAND, CA
Sample No:	O-5
Sample of:	WATER
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	5-26-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-2-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/L)	DETECTION LIMIT (UG/L)
BENZENE Method-602	3,730,000	1
ETHYL BENZENE Method-602	3,090,000	1
TOLUENE Method-602	8,110,000	1
XYLENE Method-602	16,700,000	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0609376

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-13-89

Project:	4529-01
Site:	GREYHOUND OAKLAND
Sample No:	BC 1/16-16.5'
Sample of:	SOIL
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	6-8-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-12-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/KG)	DETECTION LIMIT (UG/KG)
BENZENE Method-8020	1780	1
ETHYL BENZENE Method-8020	11300	1
TOLUENE Method-8020	1130	1
XYLENE Method-8020	37500	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0609378

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-13-89

Project:	4529-01
Site:	GREYHOUND OAKLAND
Sample No:	BC 2/16-16.5'
Sample of:	SOIL
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	6-8-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-12-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/KG)	DETECTION LIMIT (UG/KG)
BENZENE Method-8020	4000	1
ETHYL BENZENE Method-8020	13200	1
TOLUENE Method-8020	2000	1
XYLENE Method-8020	49500	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0609380

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-13-89

Project:	4529-01
Site:	GREYHOUND OAKLAND
Sample No:	BC 3/16-16.5'
Sample of:	SOIL
Sampled by:	GREYHOUND LINES, INC.
Sample Date:	6-8-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-12-89

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/KG)	DETECTION LIMIT (UG/KG)
BENZENE Method-8020	2240	1
ETHYL BENZENE Method-8020	6990	1
TOLUENE Method-8020	1030	1
XYLENE Method-8020	28900	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

LAFAYETTE
P.O. BOX 31780
ZIP 70593
PHONE: 318 984-2374

13 JUNE, 1989

GREYHOUND BUS LINES, INCORPORATED
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202

Attn: VERNON SORGEE

Project: 4529-01
Site: OAKLAND
Sample Of: SOIL
Sampled By: BROWN & CALDWELL, INC.

A N A L Y T I C A L R E S U L T S

ANALYSIS #	SAMPLE POINT	SAMPLE DATE	TOTAL PETROLEUM HYDROCARBONS(PPM)	DETECTION LIMIT(PPM)
W0609376	BC-1 16-16.5'	6-8-89	3060	10
W0609378	BC-2 16-16.5'	6-8-89	4260	10
W0609380	BC-3 16-16.5'	6-8-89	1850	10

Method: MODIFIED 418.1

Analyzed By: John Trahan
Date Analyzed: 6-3-89

ND = Parameter analyzed for but not detected. The report limit is the minimum attainable detection limit for the sample.

SOUTHERN PETROLEUM LABORATORIES

Wayne Boling

Wayne Boling, Manager

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0609377

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-19-89

Project:	4529-01
Site:	GREYHOUND OAKLAND, CA
Sample No:	BC 1 / 25-25.5'
Sample of:	SOIL
Sampled by:	BROWN & CALDWELL INC.
Sample Date:	6-8-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-14-89 @ 4:19PM

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/KG)	DETECTION LIMIT (UG/KG)
BENZENE Method-8020	ND	1
ETHYL BENZENE Method-8020	5	1
TOLUENE Method-8020	8	1
XYLENE Method-8020	27	1

ND - Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

P.O. BOX 20807
HOUSTON, TX 77225

P.O. BOX 31780
LAFAYETTE, LA 70593

1000 RIVERBEND BLVD. SUITE F
ST. ROSE, LA 70087

459 HUGHES DR.
TRAVERSE CITY, MI

P.O. BOX 646
ADDISON, TX 75533

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0609379

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-19-89

Project:	4529-01
Site:	GREYHOUND OAKLAND, CA
Sample No:	BC 2/26-26.5'
Sample of:	SOIL
Sampled by:	BROWN & CALDWELL INC.
Sample Date:	6-8-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-14-89 @ 4:40PM

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/KG)	DETECTION LIMIT (UG/KG)
BENZENE Method-8020	90	1
ETHYL BENZENE Method-8020	97	1
TOLUENE Method-8020	154	1
XYLENE Method-8020	402	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

Wayne Boling

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P.O. BOX 31780 LAFAYETTE, LA 70593
1000 RIVERBEND BLVD. SUITE F ST. ROSE, LA 70087
459 HUGHES DR. TRAVERSE CITY, MI
P.O. BOX 546 VILLAGE, TX 75633

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. W0609381

GREYHOUND LINES, INC.
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202
ATTN: VERNON SORGEE

06-19-89

Project:	4529-01
Site:	GREYHOUND OAKLAND, CA
Sample No:	BC 3/25'
Sample of:	SOIL
Sampled by:	BROWN & CALDWELL INC.
Sample Date:	6-8-89
ANALYZED BY:	JOHN TRAHAN
DATE ANALYZED:	6-14-89 @ 5:10PM

A N A L Y T I C A L R E S U L T S

ANALYSIS/METHOD	RESULTS (UG/KG)	DETECTION LIMIT (UG/KG)
BENZENE Method-8020	ND	1
ETHYL BENZENE Method-8020	ND	1
TOLUENE Method-8020	ND	1
XYLENE Method-8020	8	1

ND = Parameter analyzed for but not detected. The reported limit is the minimum attainable detection limit for the sample.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance. These procedures include the following as a minimum requirement: comparisons against known standards in each run, one in ten sample splits, and a quarterly method review against known spike samples.

Southern Petroleum Laboratories

Wayne Boling

SOUTHERN PETROLEUM LABORATORIES, INC.

LAFAYETTE
P.O. BOX 31780
ZIP 70593
PHONE: 318 984-2374

19 JUNE, 1989

GREYHOUND BUS LINES, INCORPORATED
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202

Attn: VERNON SORGEE

Project: 4529-01
Site: OAKLAN, CA
Sample Of: SOIL
Sampled By: BROWN & CALDWELL, INC.

A N A L Y T I C A L R E S U L T S

ANALYSIS #	SAMPLE POINT	SAMPLE DATE	TOTAL PETROLEUM HYDROCARBONS(PPM)	DETECTION LIMIT(PPM)
W0609377	BC-1 25-25-5'	6-8-89	ND	10
W0609379	BC-2 26-26.5'	6-8-89	ND	10
W0609381	BC-3 25'	6-8-89	ND	10

Method: MODIFIED 418.1

Analyzed By: C. GEORGE
Date Analyzed: 6-15-89 @ 1:35PM

ND = Parameter analyzed for but not detected. The report limit is the minimum attainable detection limit for the sample.

SOUTHERN PETROLEUM LABORATORIES

Wayne Boling

Wayne Boling, Manager

SOUTHERN PETROLEUM LABORATORIES, INC.

LAFAYETTE
P.O. BOX 31780
ZIP 70593
PHONE: 318 984-2374

19 JUNE, 1989

GREYHOUND BUS LINES, INCORPORATED
901 MAIN STREET
SUITE 2525
DALLAS, TEXAS 75202

Attn: VERNON SORGEE

Project: 4529-01
Site: OAKLAND, CA
Sample Of: SOIL
Sampled By: BROWN & CALDWELL, INC.

A N A L Y T I C A L R E S U L T S

ANALYSIS #	SAMPLE POINT	SAMPLE DATE	TOTAL PETROLEUM HYDROCARBONS(PPM)	DETECTION LIMIT(PPM)
W0609377	BC-1 25-25-5'	6-8-89	ND	10
W0609379	BC-2 26-26.5'	6-8-89	ND	10
W0609381	BC-3 25'	6-8-89	ND	10

Method: MODIFIED 8015

Analyzed By: J. TRAHAN
Date Analyzed: 6-19-89 @ 8:42AM

ND = Parameter analyzed for but not detected. The report limit is the minimum attainable detection limit for the sample.

SOUTHERN PETROLEUM LABORATORIES

Wayne Boling

Wayne Boling, Manager

ATTACHMENT D

QUALITY CONTROL/QUALITY ASSURANCE RESULTS

Test Code(s) TPH

Method Modified 418.1 Analysts C.G Date 6-9-89 Time

Matrix Modification

Standards:	(XT, ABS)	Act.	Theo.
Blank 6-8-89		ND	ND
#1			
#2			
#3			
#4			
#5			

# of samples in set 10

Duplicate	#1	#2
W0607239	26	36

Spike Samples	Original	Amount Added	Act.	Theo.
W0607239	31	100	146	131
		%Recovery = 111%		

JUN 13 '89 11:23

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SOUTHERN PETROLEUM LABORATORIES, INC.

BETX MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Greyhound
Shell
BFI

SPL SAMPLE ID: 06612451 DATE: 6-12-89
MATRIX: SOIL

COMPOUND	SPIKE ADDED ug/L or kg/L	SAMPLE CONCENTRATION ug/L or kg/L	MS CONCENTRATION ug/L or kg/L	MS % REC #	QC LIMITS REC.
Benzene	50	ND	49	98	39-150
Ethylbenzene	50	ND	55	110	32-160
Toluene	50	ND	38	76	46-148
m+p-Xylene	100	ND	107	107	32-160
o-Xylene	50	ND	53	106	32-160

COMPOUND	SPIKE ADDED ug/L or kg/L	MSD CONCENTRATION ug/L or kg/L	MSD % REC. #	% RPD #	QC LIMITS	
Benzene	50	52	104	5.9	20	39-150
Ethylbenzene	50	59	118	7.0	20	32-160
Toluene	50	41	82	7.6	20	46-148
m+p-Xylene	100	115	115	7.2	20	32-160
o-Xylene	50	57	114	7.3	20	32-160

$$\% \text{ Recovery} = \frac{100\ (\text{Spike Sample Result} - \text{Sample Result})}{\text{Amount Spike}}$$

$$\text{RPD} = \text{Relative Percent Deviation} = 200\ (D1 - D2) / (D1 + D2)$$

Where: D1 = MS Result
D2 = MSD Result

143 MALLARD, SUITE B
459 HUGHES DRIVE TRAVERSE CITY, MI 49684
P.O. BOX 646 CARTHAGE, TX 75633

ATTACHMENT E

TANK CLOSURE PERMIT APPLICATIONS