ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

StID 2979

ENVIRONMENTAL HEALTH SERVICES
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9335 (FAX)

June 1, 1998

Mr. Ken Ross
City of Livermore
3589 Pacific Ave
Livermore, CA 94550

Re: Fuel Leak Site Case Closure for Las Positas Golf Course, at 909 Clubhouse Dr, Livermore, CA

Dear Mr.Ross:

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with Chapter 6.75 (Article 4, Section 25299.37[h]). The State Water Resources Control Board adopted this letter on February 20, 1997. As of March 1, 1997, the Alameda County Environmental Protection Division is required to use this case closure letter for all UST leak sites. We are also transmitting to you the enclosed case closure summary. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site. The subject fuel leak case is closed.

SITE INVESTIGATION AND CLEANUP SUMMARY

Please be advised that the following conditions exist at the site:

- up to 2,800 TPH as gasoline, 1,370 ppm TPH as diesel, 11 ppm benzene exists in soil beneath the site, and
- up to 260 ppb TPHg, 490 ppb TPHd, and 42 ppb benzene exists in groundwater beneath the site, and
- a site health and safety plan is required for any excavation/trenching in the vicinity of the former gasoline tank.

If you have any questions, please contact me at (510) 567-6762.

eva chu
Hazardous Materials Specialist

enlosure:
1. Case Closure Letter
2. Case Closure Summary

c: Dave Clemens
City of Livermore, Planning Div
1052 S. Livermore Ave
Livermore, CA 94550

lpgolf-6

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1131 Harbor Bay Parkway, Suite 250
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REMEDIAL ACTION COMPLETION CERTIFICATION

StID 2979 - 909 Clubhouse Drive, Livermore, CA
(1-250 gallon diesel, 1-250 gallon gasoline/oil mix, and 1-1,000 gallon gasoline tanks removed in July 7, 1993)

June 1, 1998

Mr. Ken Ross
City of Livermore
3589 Pacific Ave
Livermore, CA 94550

Dear Mr. Ross:

This letter confirms the completion of site investigation and remedial action for the underground storage tanks formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tanks are greatly appreciated.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank release is required.

This notice is issued pursuant to a regulation contained in Title 23, Section 2721(e) of the California Code of Regulations.

Please contact our office if you have any questions regarding this matter.

Sincerely,

Mee Ling Tung, Director

cc: Richard Pantages, Chief of Division of Environmental Protection
Chuck Headlee, RWQCB
Dave Deaner, SWRCB
Danielle Stefani, Livermore-Pleasanton Fire Dept
files-ec (lpgolf-5)

01-0883

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

Date: September 29, 1997

Agency name: **Alameda County-HazMat** Address: **1131 Harbor Bay Pkwy**
City/State/Zip: **Alameda, CA 94502** Phone: **(510) 567-6700**
Responsible staff person: **Eva Chu** Title: **Hazardous Materials Spec.**

II. CASE INFORMATION

Site facility name: **Las Positas Golf Course**
Site facility address: **909 Clubhouse Dr., Livermore, CA**
RB LUSTIS Case No: **N/A** Local Case No./LOP Case No.: **2979**
URF filing date: **7/14/93** SWEEPS No: **N/A**

Responsible Parties:	Addresses:	Phone Numbers:
City of Livermore Attn. Ken Ross	3589 Pacific Ave Livermore, CA 94550	510/373-5253

Tank No:	Size in gal.:	Contents:	Closed in-place or removed?:	Date:
1	1,000	Gasoline	Removed	7/7/93
2	250	Diesel	"	"
3	250	Gasoline/Oil Mix	"	"

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: **Leaking UST/piping**
Site characterization complete? **YES**
Date approved by oversight agency: **5/10/96**
Monitoring Wells installed? **Yes** Number: **3**
Proper screened interval? **Yes, 10 to 39' bgs**
Highest GW depth below ground surface: **12.70** Lowest depth: **15.60' in MW-3**
Flow direction: **NW, with gradient of 0.001 ft/ft.**
Most sensitive current use: **Golf course/maintenance building**
Are drinking water wells affected? **No** Aquifer name: **Amador Subbassin**
Is surface water affected? **No** Nearest affected SW name: **NA**
Off-site beneficial use impacts (addresses/locations): **None**

Report(s) on file? **YES** Where is report(s) filed? **Alameda County**
1131 Harbor Bay Pkwy
Alameda, CA 94502

Treatment and Disposal of Affected Material:

Material	Amount (include units)	Action (Treatment or Disposal w/destination)	Date
Tank & Piping	3 USTs	Disposed by H & H in San Francisco	7/7/93

Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm) Before[1]	Soil (ppm) After	Water (ppb) Before[3]	Water (ppb) After[4]
TPH (Gas)	2,110	2,110	1,900	260
TPH (Diesel)	1,370	1,370[2]	140	490
Benzene	11	11	93	42
Toluene	110	110	16	ND
Ethylbenzene	45	45	20	88
Xylenes	215	215	190	1.0
Heavy metals	Total Pb 7.6			
Other				

NOTE:
1 soil sample from beneath 1K gasoline UST at time of removal
2 soil sample from beneath 250 gal. diesel UST
3 maximum concentrations detected in well MW-3
4 most recent samping event in 5/97

Comments (Depth of Remediation, etc.):

See Section VII, Additional Comments, etc...

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? **Undetermined**
Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? **Undetermined**
Does corrective action protect public health for current land use? **YES**
Site management requirements: **A site health and safety plan is required for any excavation or trenching in the vicinity of the former gasoline tank where residual contamination remain in place.**

Should corrective action be reviewed if land use changes? **YES**
Monitoring wells Decommissioned: **No, pending site closure**
Number Decommissioned: **0** Number Retained: **3**
List enforcement actions taken: **None**
List enforcement actions rescinded: **NA**

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: **Eva Chu** Title: **Haz Mat Specialist**

Signature: Date: 10/10/97

Reviewed by

Name: **Larry Seto** Title: **Sr. Haz Mat Specialist**

Signature: Date: 9-30-97

Name: **Thomas Peacock** Title: **Supervisor**

Signature: Date: 10-9-97

VI. RWQCB NOTIFICATION

Date Submitted to RB: 10/10/97 RB Response: Approved

RWQCB Staff Name: **Kevin Graves** Title: **AWRCE**

Signature: Date: 10-22-97

VII. ADDITIONAL COMMENTS, DATA, ETC.

Three USTs (2-250 gallon USTs in one pit, and 1-1K gasoline in another pit) were removed in July 1993. Soil samples collected from beneath the 250 diesel and 1K gasoline USTs exhibited elevated levels of TPH-D (1,370 ppm) and TPH-G (2,110 ppm) and BTEX (11, 110, 45, and 215 ppm, respectively). (See Fig 1, 2, and Table 1)

In November 1994 a total of 8 investigative soil borings (IB-1 through IB-8) and 3 monitoring wells (MW-1 through MW-3) were drilled. Five of the eight investigative borings were around the former 1K gasoline UST, and three around the former diesel UST. Wells MW-1 and MW-3 were located ~10' in the expected downgradient (SW) direction from the former diesel and gasoline UST, respectively. (See Fig 2)

Soil samples from the borings around the diesel pit did not contain hydrocarbon constituents. It appears that impacted soil is limited in extent around the former diesel UST. Soil samples from the borings around the gasoline pit identified up to 230 ppm TPH-G and 2.5, 24, 51, and 6.5 ppm BTEX, respectively, in boring IB-2. Concentrations decreased to 14 ppm TPH-G and .019 ppm benzene in boring IB-4, which is ~10' west of boring IB-2. It appears gasoline-impacted soil extends less that 15' in the westerly direction from the former gasoline UST pit, and is limited to a narrow layer at about 12 to 16' bgs. (See Table 2)

Groundwater has been sampled from 11/94 to 5/97). Groundwater flow direction has been to the NW with a relatively flat gradient of ~0.001 ft/ft (see Fig 3, Table 3). Although the monitoring wells appear to be more cross-gradient from the former gasoline and diesel pits, the relatively flat gradient would suggest water samples from the wells are representative of groundwater quality beneath the site. There are no domestic-use or irrigation water wells in the immediate vicinity of the site.

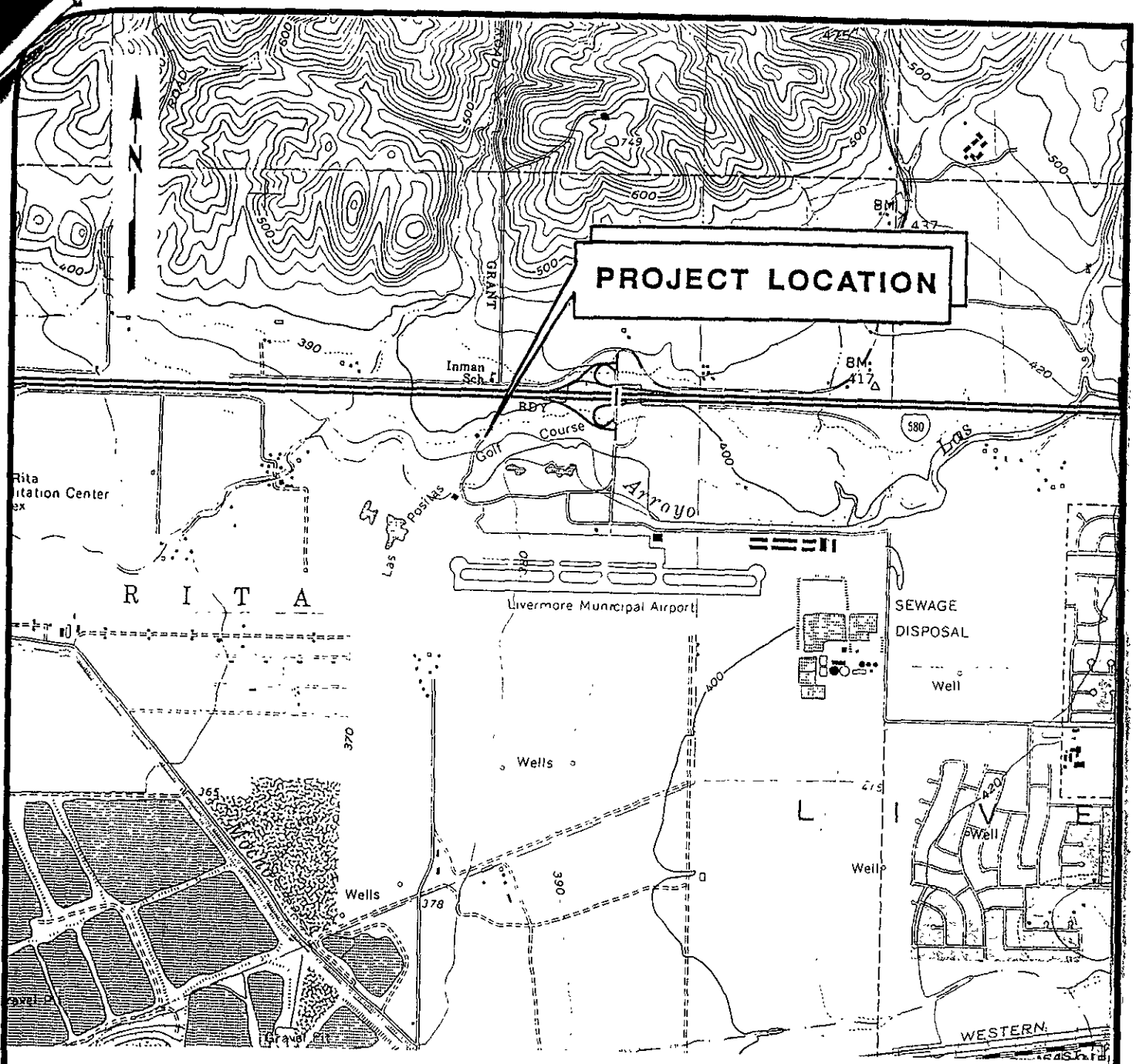
Well MW-3, which is downgradient from the former gasoline UST exhibits elevated levels of benzene. However, with 93 ppb benzene in groundwater, a cancer risk, for a commercial scenario, due to groundwater volatilization to outdoor air does not exceed 10^{-6}; due to groundwater ingestion does not exceed 10^{-4}; and due to groundwater vapor intrusion to buildings does not exceed 10^{-5}, based on ASTM's Tier 1 RBSL Look-Up Table.

Also, with a residual of 11 ppm benzene in soil at 12 to 16' bgs, a cancer risk due to soil volatilization to outdoor air does not exceed a risk of 10^{-4}. Soil vapor intrusion to buildings is minimized since a concrete slab covers the entire maintenance building, doors are left open during working hours to provide rapid air change within the building, and residual soil contamination is limited to depths of 12' to 16'bgs.

This site qualifies as a low risk groundwater case as defined in the SF-RWQCB Interim Guidance on Required Cleanup at Low Risk Fuel Sites, January 1996. Residual contaminants in soil and groundwater should naturally bioattenuate. Continued sampling is not warranted.

In summary, case closure is recommended because:

- the leak and ongoing sources have been removed;
- the site has been adequately characterized;
- the dissolved plume is not migrating;
- no water wells, surface water, or other sensitive receptors are likely to be impacted; and,
- the site presents no significant risk to human health or the environment.



SCALE 1:24 000

1 MILE

7000 FEET

1 KILOMETER

CONTOUR INTERVAL 20 FEET

DASHED LINES REPRESENT HALF-INTERVAL CONTOURS

NATIONAL GEODETIC VERTICAL DATUM OF 1929

DESIGNED BY:	CHECKED BY:	**FIGURE 1**	DATE:	FIGURE: 1
DRAWN BY:	SCALE:	**SITE VICINITY MAP**	CENTURY WEST ENGINEERING	
DWG. NO.:		**CWEC: 20549-001-01**		

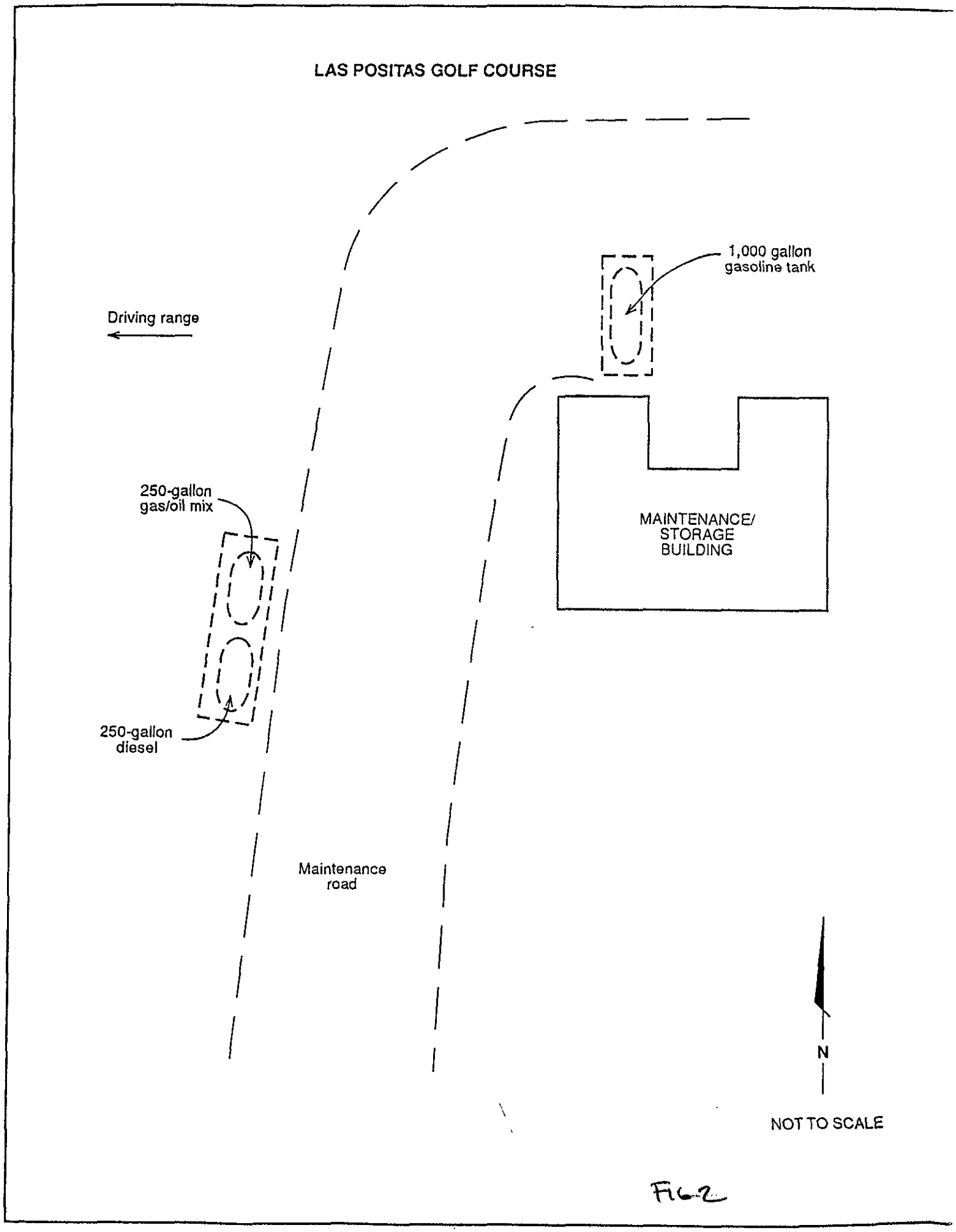
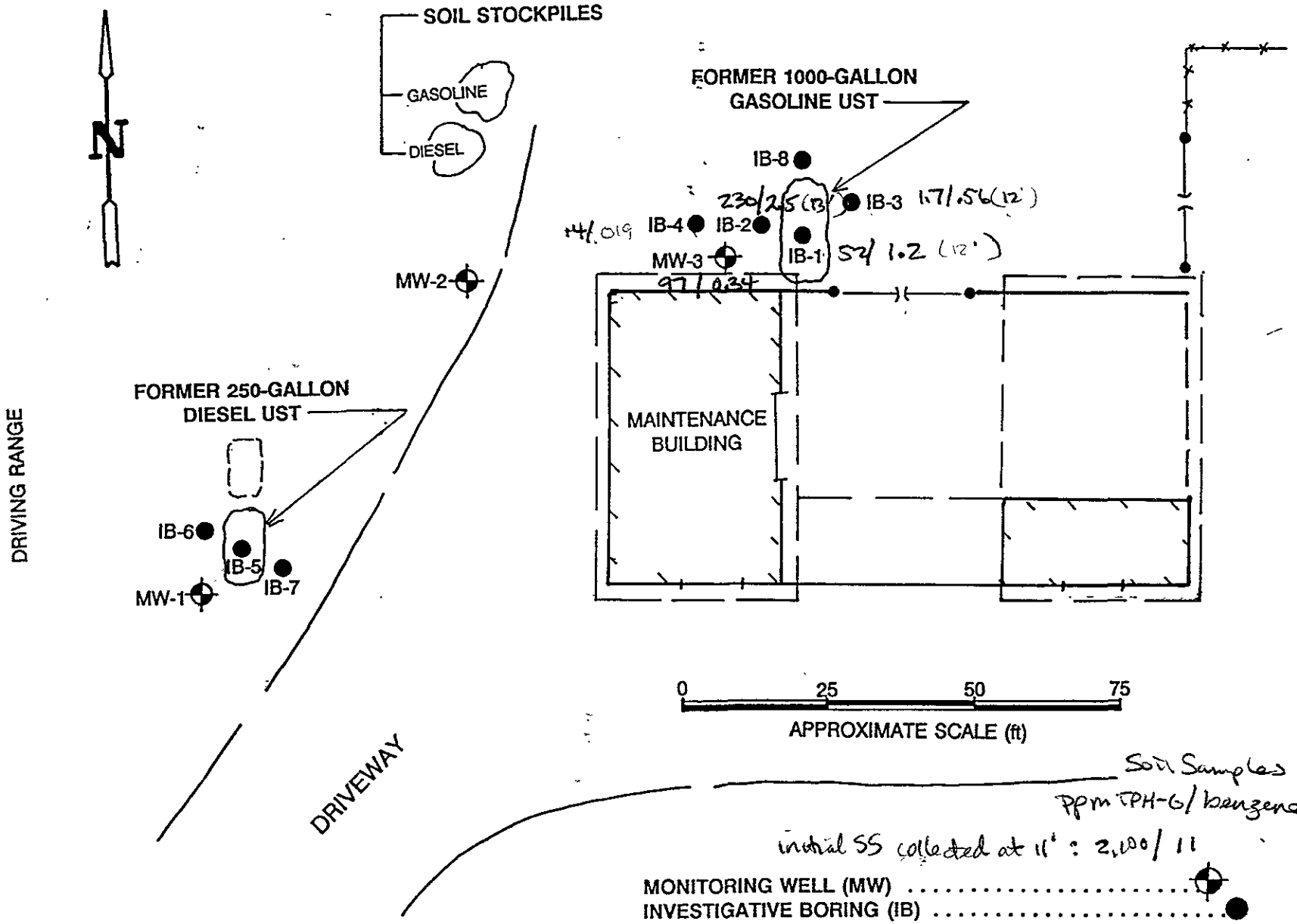

LAS POSITAS GOLF COURSE
1,000 gallon gasoline tank
Driving range
MAINTENANCE/ STORAGE BUILDING
250-gallon gas/oil mix
250-gallon diesel
Maintenance road
N
NOT TO SCALE

Fig 2



DESIGNED BY :	DATE :	CENTURY WEST ENGINEERING	DRAWING NO.
DRAWN BY :	SCALE :	FIGURE 3	SHEET NO.

right to appear and show cause, if any they have, for the exclusion or inclusion of any of the parties, parties in interest and properties named herein from said responsibility or obligations:

Mr. Terry Kegg, as an individual
1433 105th Avenue
Oakland, CA 94603

Mr. Terry Kegg, dba
United Acoustics
1433 105th Avenue
Oakland, CA 94603

United Acoustics, a corporation
1433 105th Avenue
Oakland, CA 94603

The Franklin Kegg Trust
Terry Kegg, Marliyn Pedersen and Christy Kegg Trustees
1433 105th Avenue
Oakland, CA 94603

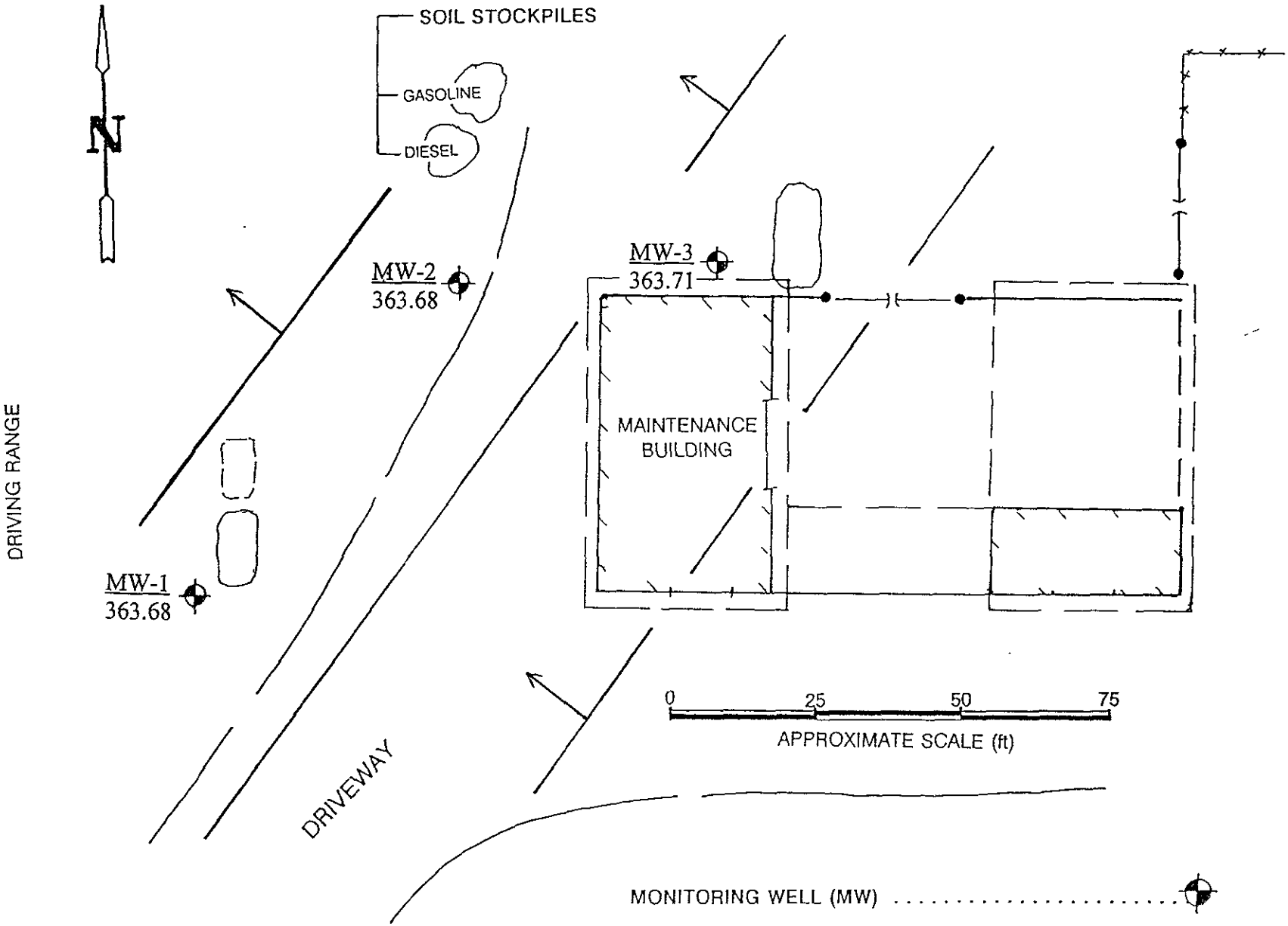
Ronald Ko, property owner
1439 105th Avenue
Oakland, CA 94603

Dated: _____

Alameda County Health Officer

By:_____
Gordon Coleman
Acting Chief
Alameda County Department of
Environmental Protection

cc: Gil Jensen, Alameda County District Attorney's Office
Eva Chu, Alameda County Department of Environmental Protection



DESIGNED BY :	DATE :	CENTURY WEST ENGINEERING	FIGURE 4 SITE PLAN/GRADIENT MAP GRADIENT = 0.001 (ft/ft)	DRAWING NO.
DRAWN BY :	SCALE :			SHEET NO.

Table 1. Results of Chemical Analyses on Soil Samples Las Positas Golf Course and Springtown Golf Course Livermore, California

Golf Course ID	Sample I.D	Depth of Sample (feet)	TPH as Gasoline (ppm)	Diesel Fuel (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylenes (ppm)	Total Lead (ppm)
Las Positas	250 - Diesel	10.0	NA	1,370	ND	0.08	0.1	0.6	NA
Las Positas	250 - Gas/Oil	10.5	ND	ND	ND	ND	ND	ND	ND
Las Positas	1,000 - South	11.0	2,110	NA	11	110	45	215	10.2
Las Positas	1,000 - North	11.0	30	NA	0.12	0.5	0.06	0.43	9.86
Springtown	250* - Springtown	9.0	11	NA	0.2	0.05	0.07	0.34	7.90
Detection Limits			5	10	0.005	0.005	0.005	0.015	5.0

ND = Not detected
NA = Not analyzed
ppm = Parts per million

* Sample ID on chain-of-custody identified this as a 250-gallon tank when actually the tank volume was approximately 500 gallons

Table 2
SUMMARY OF SOIL AND GROUND WATER ANALYTICAL RESULTS
City of Livermore Los Positas Golf Course UST Site

Sample ID	Sample Depth	Concentration (ppm) TPH-D	TPH-G	Benzene	Toluene	Xylenes	Ethylbenzene
Soil Samples		Nov 9 1994					
IB-1.1	7.0 ft	--[1]	6.6	0.013	ND(0.005)[2]	0.79	0.13
IB-1.2	12.0 ft	--	52	1.2	2.9	9.6	1.7
IB-1.3	18.0 ft	--	5.9	1.7	ND(0.005)	ND(0.005)	ND(0.005)
IB-2.1	8.0 ft	--	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-2.2	13.0 ft	--	230[3]	2.5	2.4	51	6.5
IB-2.3	18.0 ft	--	ND(1.0)	0.010	ND(0.005)	0.075	0.011
IB-3.1	8.0 ft	--	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-3.2	12.0 ft	--	1.7	0.56	ND(0.005)	ND(0.005)	0.079
IB-3.3	17.5 ft	--	ND(1.0)	0.051	ND(0.005)	ND(0.005)	0.006
IB-4.2	13.0 ft	--	14	0.019	ND(0.005)	ND(0.005)	ND(0.005)
IB-4.3	18.0 ft	--	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-5.1	12.0 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-5.2	16.0 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-6.2	10.5 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-6.3	15.5 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-7.2	5.5 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-7.3	16.0 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	D(0.005)
IB-8.1	6.0 ft	--	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
IB-8.2	11.0 ft	--	ND(1.0)	0.13	ND(0.005)	0.13	0.073
MW-1.2	10.5 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
MW-1.3	15.5 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
MW-2.1	10.5 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
MW-2.2	21.0 ft	ND(5.0)	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
MW-3.1	7.0 ft	--	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
MW-3.2	13.0 ft	--	97	0.34	0.051	5.4	0.25
MW-3.3	20.0 ft	--	ND(1.0)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Ground Water Samples			Nov 18 1994				
MW-1	NA[4]	ND(0.05)	--	ND(.0003)	ND(.0003)	ND(.0005)	ND(.0003)
MW-2	NA	ND(0.05)	ND(0.05)	ND(.0003)	ND(.0003)	ND(.0005)	ND(.0003)
MW-3	NA	--	0.140	0.0011	ND(.0003)	0.0062	0.00079

1 - Not analyzed for this analyte.
2 - Not detected above the values expressed in the parentheses.
3 - Shaded values are above regulatory action level of 100 ppm.
4 - Not applicable.

Table # 3

Summary of Current and Historical Groundwater Monitoring Results

City of Livermore, Las Positas Golf Course

909 Club House Drive

Livermore, California

Sample ID	Date of Sampling	Water Table Elevation	Depth to Water	Concentration (mg/L)						
				TPH-D	TPH-G	Benzene	Toulene	Ethyl-benzene	Total Xylenes	MTBE
MW-1	11/18/94	363.88	14.38	ND	NA	ND	ND	ND	ND	NA
(378.26 elv.)	02/16/95	367.09	11.5	0.14	NA	ND	ND	ND	ND	NA
	07/13/95	356.41	12.85	ND	NA	ND	ND	ND	ND	NA
	09/19/95	363.68	14.58	0.14	NA	ND	ND	ND	ND	NA
	11/08/96	363.19	15.07	0.13	NA	ND	ND	ND	ND	NA
	05/01/97	365.46	13.13	0.18	NA	NA	NA	NA	NA	NA
MW-2	11/18/94	364.15	15	ND	ND	ND	ND	ND	ND	NA
(378.75 elv.)	02/16/95	367.04	12.11	0.13	0.06	ND	ND	ND	ND	NA
	07/13/95	365.41	13.34	ND	ND	ND	ND	ND	ND	NA
	09/19/95	363.68	15.07	0.10	0.06	ND	ND	ND	ND	NA
	11/08/96	363.09	15.66	0.17	ND	ND	ND	ND	ND	NA
	05/01/97	365.59	13.56	0.49	ND	NA	NA	NA	NA	NA
MW-3	11/18/94	364.24	15.55	NA	0.140	0.0011	ND	0.00079	0.00079	NA
(379.31 elv.)	02/16/95	367.09	12.7	NA	1.9	0.078	ND	0.017	0.017	NA
	07/13/95	365.38	13.93	NA	0.510	0.066	0.0005	0.016	0.016	NA
	09/19/95	363.71	15.6	NA	0.62	0.093	0.0008	0.020	0.020	NA
	11/08/96	363.13	16.18	NA	0.18	0.012	ND	0.002	0.002	NA
	05/01/97	365.65	14.14	NA	0.26	0.042	ND	0.088	0.001	0.088

NOTES

mg/l	milligrams per liter
TPH-G	total petroleum hydrocarbons quantified as Gasoline
TPH-D	total petroleum hydrocarbons quantified as Diesel
MTBE	methyl-tert-butylether
(378.26 elv.)	top of casing elevation
ND	not detected above laboratory method detection limit
NA	not analyzed or not available

SOIL BORING LOG IB-1

Century West Engineering

Site Location: City of Livermore Las Positas Golf Course	Boring ID: IB-1	Total Depth:	25.0 ft
Boring Location: Inside backfilled gasoline excavation.	Elevation:	GW Depth:	23 ft
Purpose: Soil investigation	Logged By:	Bob Bogar	
Date: November 8, 1994	Blank Casing:	From:	To:
Consulting Firm: Century West Engineering	Perforations:	From:	To:
Project Number: 20549-004-01	Filter Sand:	From:	To:
Drilling Contractor: Kvilhaug Drilling	Bentonite:	From:	To:
Drilling Method: Hollow Stem Auger	Grout:	From: 25.0 ft	To: Surface

Depth	Sample Interval	Sample ID	Blow Counts	Laboratory TPH-G	Soil Description		Remarks
01 02 03 04 05					0 - 1.0 ft 1.0 - 7.0 ft	Brown to grey pebbly SILT; moist, no hydrocarbon odor or discoloration. Brown to grey silty GRAVEL (excavation backfill); moist, no hydrocarbon odor or discoloration.	Note: Boring located within backfilled gasoline excavation pit.
06 07 08 09 10	T ⊥	IB-1.1	6 10 11	6.6	7.0 - 12.0 ft	Light to medium green clayey SILT; moist, firm; slight to moderate hydrocarbon odor.	
11 12 13 14 15	T ⊥	IB-1.2	5 9 11	52	12.0 - 13.0 ft 13.0 - 17.0 ft	Medium brown to grey silty SAND; moist, soft; moderate hydrocarbon odor, light discoloration. Green clayey SILT; very moist, soft; moderate hydrocarbon odor, light discoloration.	
16 17 18 19 20	T ⊥	IB-1.3	17 28 38	5.9	17.0 - 23.0 ft	Medium brown, fine sandy SILT; very moist; no hydrocarbon odor or discoloration.	
21 22 23 24 25					23.0 - 26.5 ft	Brown clayey SILT; very firm, moist; no hydrocarbon odor or discoloration.	

Final Auger Depth - 23.0 ft
Approximate Ground Water Depth - 23.0 ft

SOIL BORING LOG IB-2

Century West Engineering

Site Location: City of Livermore Las Positas Golf Course	Boring ID: IB-2	Total Depth:	23.0 ft
Boring Location: West from backfilled gasoline excavation	Elevation:	Approx GW Depth:	22.0 ft
Purpose: Soil investigation	Logged By:	Bob Bogar	
Date: November 8, 1994	Blank Casing:	From:	To:
Consulting Firm: Century West Engineering	Perforations:	From:	To:
Project Number: 20549-004-01	Filter Sand:	From:	To:
Drilling Contractor: Kvilhaug Drilling	Bentonite:	From:	To:
Drilling Method: Hollow Stem Auger	Grout:	From: 23.0 ft	To: Surface

Depth	Sample Interval	Sample ID	Blow Counts	Laboratory TPH-G	Soil Description		Remarks
01					0 - 0.5 ft	Asphalt	
02					0.5 - 3.0 ft	Grey to light green gravelly SILT; no hydrocarbon odor or discoloration.	
03							
04					3.0 - 5.0 ft	Black CLAY; moist, soft, sub-angular pebbles to 1 cm; no hydrocarbon odor or discoloration.	
05							
06							
07	T		7		5.0 - 12.0 ft	Light to medium green, sandy clayey SILT; soft, moist; slight hydrocarbon odor.	
08	⊥	IB-2.1	14 20	ND			
09							
10							
11							
12	T		7		12.0 - 16.0 ft	Light to medium grey to green clayey SILT; moderate hydrocarbon odor.	
13	⊥	IB-2.2	11 15	230			
14							
15							
16							
17	T		15		16.0 - 23.0 ft	Light to medium brown, clayey SILT; soft, moist; very slight hydrocarbon odor, no discoloration.	
18	⊥	IB-2.3	23 32	ND			
19							
20							
21							
22							
23							
24					Final Auger Depth - 23.0 ft Ground Water Depth - 23.0 ft		
25							

SOIL BORING LOG MW-3

Century West Engineering

Site Location: City of Livermore Las Positas Golf Course	Boring ID: MW-2 Total Depth: 40.0 ft
Boring Location: Downgradient from former gasoline UST	Elevation: Initial GW Depth: 20 ft
Purpose: Ground water investigation	Logged By: Bob Bogar Final GW Depth: 20 ft
Date: November 11, 1994	Blank Casing: From: 9.65 ft To: 0.0 ft
Consulting Firm: Century West Engineering	Perforations: From: 38.8 ft To: 9.65 ft
Project Number: 20549-004-01	Filter Sand: From: 40.0 ft To: 8.0 ft
Drilling Contractor: Kvilhaug Drilling	Bentonite: From: 8.0 ft To: 7.0 ft
Drilling Method: Hollow Stem Auger	Grout: From: 7.0 ft To: Grade

Depth	Sample Interval	Sample ID	Blow Counts	Laboratory TPH-G	Soil Description		Remarks
01 02 03 04 05					0.0 - 0.5 ft	Asphalt	
					0.5 - 6.0 ft	Dark brown to black silty CLAY; firm, moist; no hydrocarbon odor or discoloration.	
06 07 08 09 10	T ⊥	MW-3.1	7 12 25	ND	5.0 - 10.0 ft	Light brown clayey SILT; firm, moist; no hydrocarbon odor or discoloration.	
11 12 13 14 15	T ⊥	MW-3.2	9 10 18	97	10.0 - 20.0 ft	Light brown silty sandy CLAY; firm moist; slight to moderate hydrocarbon odor, no discoloration.	
16 17 18 19 20							
21 22 23 24 25	T ⊥	MW-3.3	9 10 18	ND	25.0 - 35.0 ft	Light brown silty CLAY; moist, soft; no hydrocarbon odor or discoloration.	

SOIL BORING LOG MW-3

Century West Engineering

Site Location: City of Livermore Las Positas Golf Course

Boring ID: MW-2

Total Depth: 40.0 ft

26 27 28 29 30						
31 32 33 34 35					35.0 - 45.0 ft	Light brown CLAY; firm, moist to wet; no hydrocarbon odor or discoloration.
36 37 38 39 40					Final Auger Depth - 40.0 ft Approximate Ground Water Depth - 20.0 ft	