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

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

StID 1969

August 31, 1998

Mr. David Grede
Waste Management of Alameda
6175 South Front Street
Livermore, CA 94550

Re: Fuel Leak Site Case Closure for Livermore-Dublin Disposal Co., at 6175 S Front Street, Livermore, CA

Dear Mr. Grede:

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 380ppm TPH as gasoline and 1,3ppm benzene exists in soil beneath the site;
- up to 5.8ppb benzene exists in groundwater beneath the site; and,
- a site safety plan must be prepared for construction workers in the event of excavation/trenching is proposed in the vicinity of residual soil and groundwater contamination.

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

eva chu
Hazardous Materials Specialist

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

c: Dave Clemens, City of Livermore, Planning Div., 1052 S. Livermore Ave., Livermore, CA 94550
files (lddsposl-8)

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

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

REMEDIAL ACTION COMPLETION CERTIFICATION

StID 1969 - 6175 S Front Street, Livermore, CA
(1-10K and 1-4K gallons tanks removed on April 24, 1992)

August 31, 1998

Mr. David Grede
Waste Management of Alameda
6175 S Front Street
Livermore, CA 94550

Dear Mr. Grede:

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 Department
files-ec (lddsposl-7)

Log # 01-1089

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION

Date: May 15, 1998

Agency name: **Alameda County-HazMat**
City/State/Zip: **Alameda, CA 94502**
Responsible staff person: **Eva Chu**

Address: **1131 Harbor Bay Pkwy**
Phone: **(510) 567-6700**
Title: **Hazardous Materials Spec.**

II. CASE INFORMATION

Site facility name: **Livermore-Dublin Disposal Co**
Site facility address: **6175 S. Front Street, Livermore, CA 94550**
RB LUSTIS Case No: **N/A** Local Case No./LOP Case No.: **1969**
URF filing date: **1/31/91** SWEEPS No: **N/A**

Responsible Parties:	Addresses:	Phone Numbers:
Waste Management of Alameda **Attn. David Grede**	**6175 South Front Street** **Livermore, CA 94550**	**510/447-1324**

Tank No:	Size in gal.:	Contents:	Closed in-place or removed?:	Date:
1	10,000	Diesel	Removed	4/24/92
2	4,000	Gasoline/Diesel	Removed	4/24/92

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: **Piping leak**
Site characterization complete? **YES**
Date approved by oversight agency: **3/24/98**
Monitoring Wells installed? **Yes** Number: **7**
Proper screened interval? **Yes, ~6' to 30' bgs in well MW-2**
Highest GW depth below ground surface: **5.95'** Lowest depth: **9.56' in MW-2**
Flow direction: **NW**
Most sensitive current use: **Commercial/Industrial**
Are drinking water wells affected? **No** Aquifer name: **Spring Subbasin**
Is surface water affected? **No** Nearest affected SW name: **NA**
Off-site beneficial use impacts (addresses/locations): **NA**
Report(s) on file? **YES** Where is report(s) filed? **Alameda County, 1131 Harbor Bay Pkwy, Alameda, CA 94502** and **Livermore Fire Dept, 4550 East Ave, Livermore, CA 94550**

Treatment and Disposal of Affected Material:

Material	Amount (include units)	Action (Treatment or Disposal w/destination)	Date
Tank & Piping	**2 USTs**	**Disposed at Chem Waste, Kettleman Hill**	**4/24/92**
Soil	**1,060 cy**	**Disposed at Chem Waste, Kettleman Hill per report dated 9/92**	
	130 cy	**Disposed at Altamont L.F., Livermore**	
Groundwater	**14,000 gal.**	**Recycled at Everygreen Oil, Newark CA**	
	6.2 million gallons	**treated onsite for reuse/discharge to sanitary sewer**	

Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)	
	Before[1]	After[2]	Before[3]	After[4]
TPH (Gas)	**7,950**	**386**	**61,000**	**220**
TPH (Diesel)	**80**	**2**	**5,400**	**370**
Benzene	**41.6**	**1.3**	**17,000**	**5.8**
Toluene	**136**	**3.2**	**23,300**	**<.5**
Ethylbenzene	**35.4**	**3.6**	**3,800**	**5.1**
Xylenes	**228**	**16.6**	**18,000**	**1.3**
MtBE	**NA**	**NA**	**NA**	**2.8**

NOTE: 1 maximum soil concentration from tank excavation, 4/92
2 confirmatory soil sample after overexcavation, 7/92
3 maximum dissoved concentrations from well MW-1 or MW-2. Free product/sheen was encountered in well MW-1 in 12/88
4 most recent samling event, 11/97

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? _____

Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? _____

Does corrective action protect public health for current land use? **YES**

Site management requirements: **A site safety plan must be prepared for construction workers in the event excavation/trenching is proposed in the vicinity of residual soil and groundwater contamination.**

Should corrective action be reviewed if land use changes? **YES**

Monitoring wells Decommissioned: **Yes**

Number Decommissioned: **1** Number Retained: **6, to be decommissioned upon site closure**

List enforcement actions taken: **NA**

List enforcement actions rescinded: **NA**

V. LOCAL AGENCY REPRESENTATIVE DATA

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

Signature: Eva Chu Date: 5/29/98

Reviewed by

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

Signature: Larry Seto Date: 5-15-98

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

Signature: Thomas Peacock Date: 5-29-98

VI. RWQCB NOTIFICATION

Date Submitted to RB: 5/29/98 RB Response:

RWQCB Staff Name: **Chuck Headlee** Title: **AEG**

Signature: Chuck Headlee Date: 6/4/98

VII. ADDITIONAL COMMENTS, DATA, ETC.

The Livermore-Dublin Disposal Facility is an administration and truck maintenance facility. Prior to April 1992, onsite vehicles were fueled either by the diesel or gasoline underground storage tanks. In February 1988 the 4K gallon gasoline UST failed the system tightness test due to a faulty glue joint in the piping. The piping was repaired. A soil sample collected beneath the pipe joint contained up to 1,700 ppm TPHg. Based on these results, groundwater monitoring well MW-1 was installed in December 1988. This well initially contained ~1.1" of product. (See Figs 1, 2, 3, and Table 1)

In September 1989, monitoring wells MW-2 through MW-4 were installed to further delineate the extent of groundwater contamination. Elevated hydrocarbon concentration levels were noted in downgradient well MW-2 (see Fig 4). Three additional monitoring wells MW-5 through MW-7 were installed in October. 1990. . In addition, groundwater samples were collected from four borings (SB-1, SB-3, SB-5, and SB-6). Dissolved hydrocarbon constituents were detected in well MW-6 and MW-7 and boring SB-1 and SB-3 (see Fig 5, Table 2 and 3). A groundwater extraction and treatment system was installed in November 1991. Wells MW-2 and MW-6 were converted into extraction wells (later well MW-7 was added to the extraction system). Water was pumped through granular carbon filters. After treatment the water was used at the facility to wash vehicles or was discharged to the sanitary sewer. The treatment system was turned off in October 1995 after hydrocarbon concentrations reached asymptotic levels. A total of ~6.2 million gallons of groundwater was extracted from the monitoring wells.

In early 1991 the 10K diesel tank failed a tightness test. This tank was emptied and its use discontinued. The 4K tank was converted into a diesel tank. It was not until April 1992 that both USTs were removed.

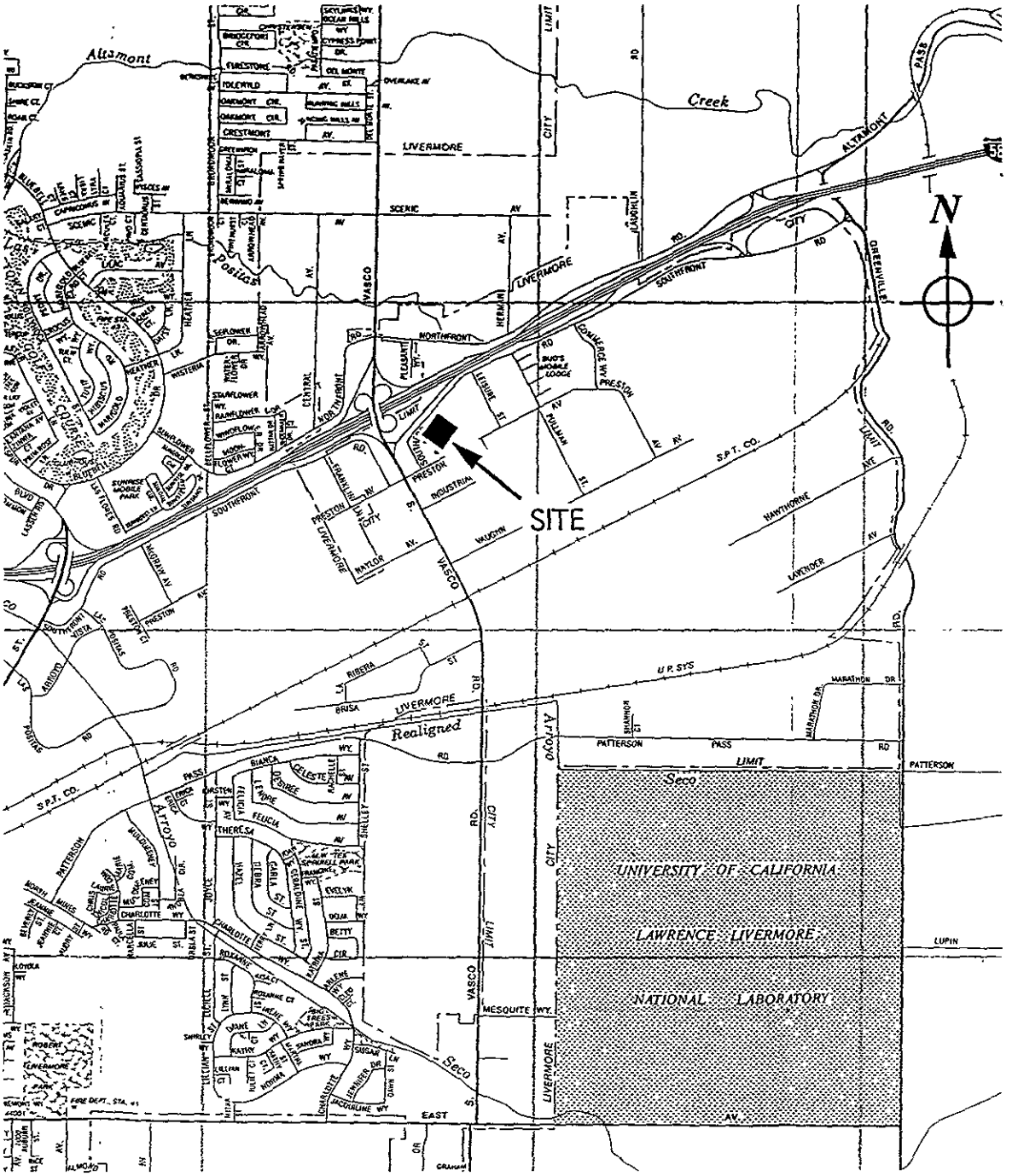
When the USTs were removed, four soil samples (TP01 through TP04) were collected. Based on analytical results the pit was overexcavated in four phases. Well MW-1 was destroyed during the excavation activities. The final excavation depth ranged from 16 to 18' bgs. A total of ~1,200 cy of soil was excavated by July 1992. Soil samples were collected after each phase of excavation, on May 2, 17,19, and July 14, 1992. Groundwater was encountered at ~15' bgs. This depth was ~5' below the depth to water in the adjacent monitoring wells, indicating that first groundwater is under confined or semi-confined conditions. Confirmatory soil samples indicated that the majority of hydrocarbon impacted soil was removed. (See Figs 6, 7, 8, 9 and 10, Table 4)

In May 1992 approximately 14,000 gallons of groundwater was pumped from the excavation pit to a tanker truck, and transported to Evergreen for recycling. In July 13, 1992 a submersible pump was installed in the excavation to continuously dewater the excavation. Groundwater was pumped into a temporary 20,000 gallon Baker tank and subsequently connected to the existing extraction/treatment system, aiding in the overall remediation of hydrocarbon impacted groundwater at the site.

In April 1996, Oxygen Releasing Compound (ORC) was added to well MW-2 and MW-6 to aid in the natural biodegration process. After four years of remediation and six years of monitoring, hydrocarbon concentrations have reached levels which would pose not risk to human health or the environment. Continued monitoring is not warranted. (See Fig 11, Table 5)

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 in Miles

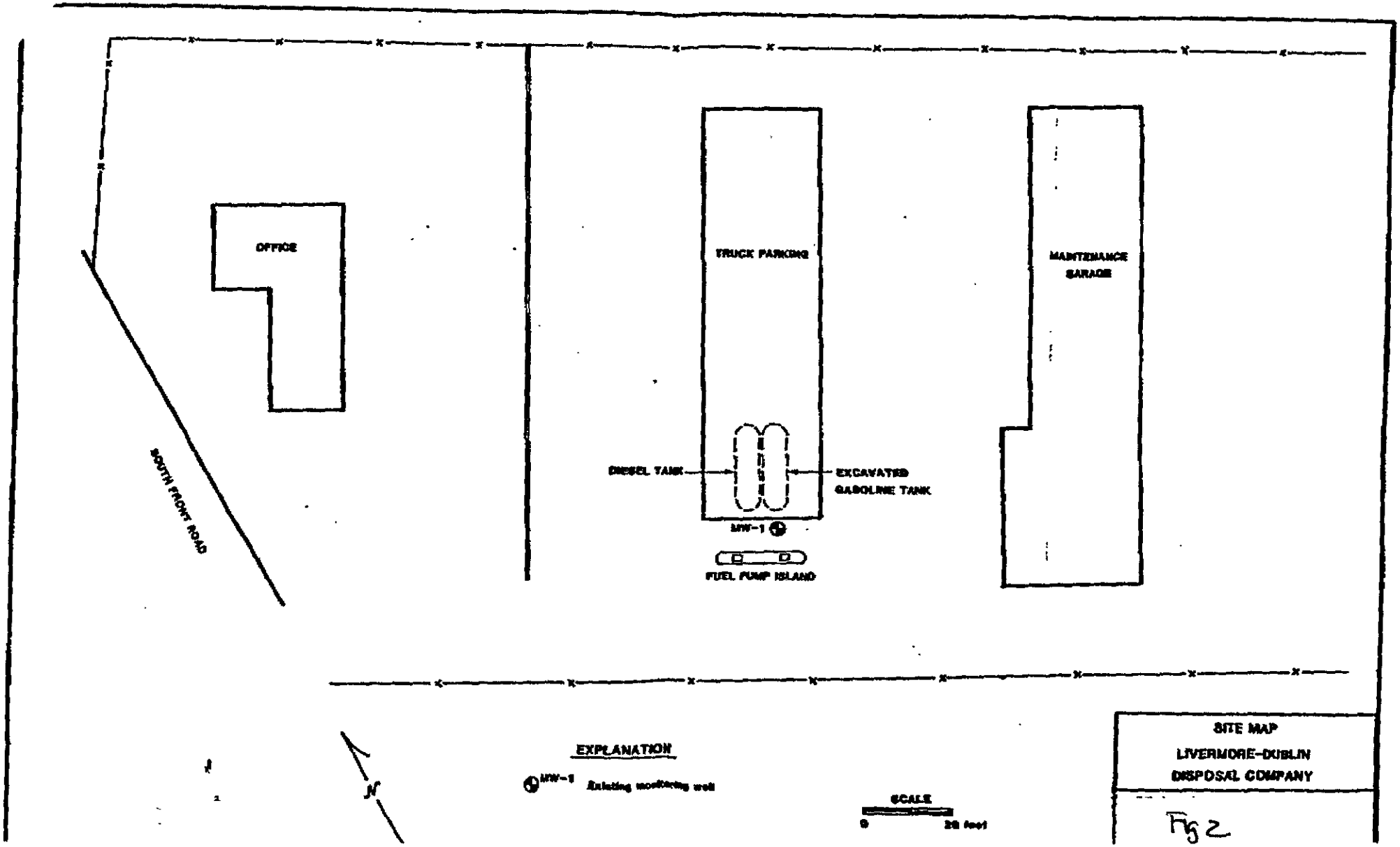
0 1/2 1

SEC DONOHUE
Environment & Infrastructure

FIGURE 1
SITE LOCATION

Livermore-Dublin Disposal Company
6175 South Front Road, Livermore, CA

W2564\LDFIG1


OFFICE
TRUCK PARKING
MAINTENANCE GARAGE
SOUTH FRONT ROAD
DIESEL TANK
EXCAVATED GASOLINE TANK
MW-1
FUEL PUMP ISLAND
EXPLANATION
MW-1 Existing monitoring well
N
SCALE
0
20 feet
SITE MAP
LIVERMORE-DUBLIN
DISPOSAL COMPANY
Fig 2

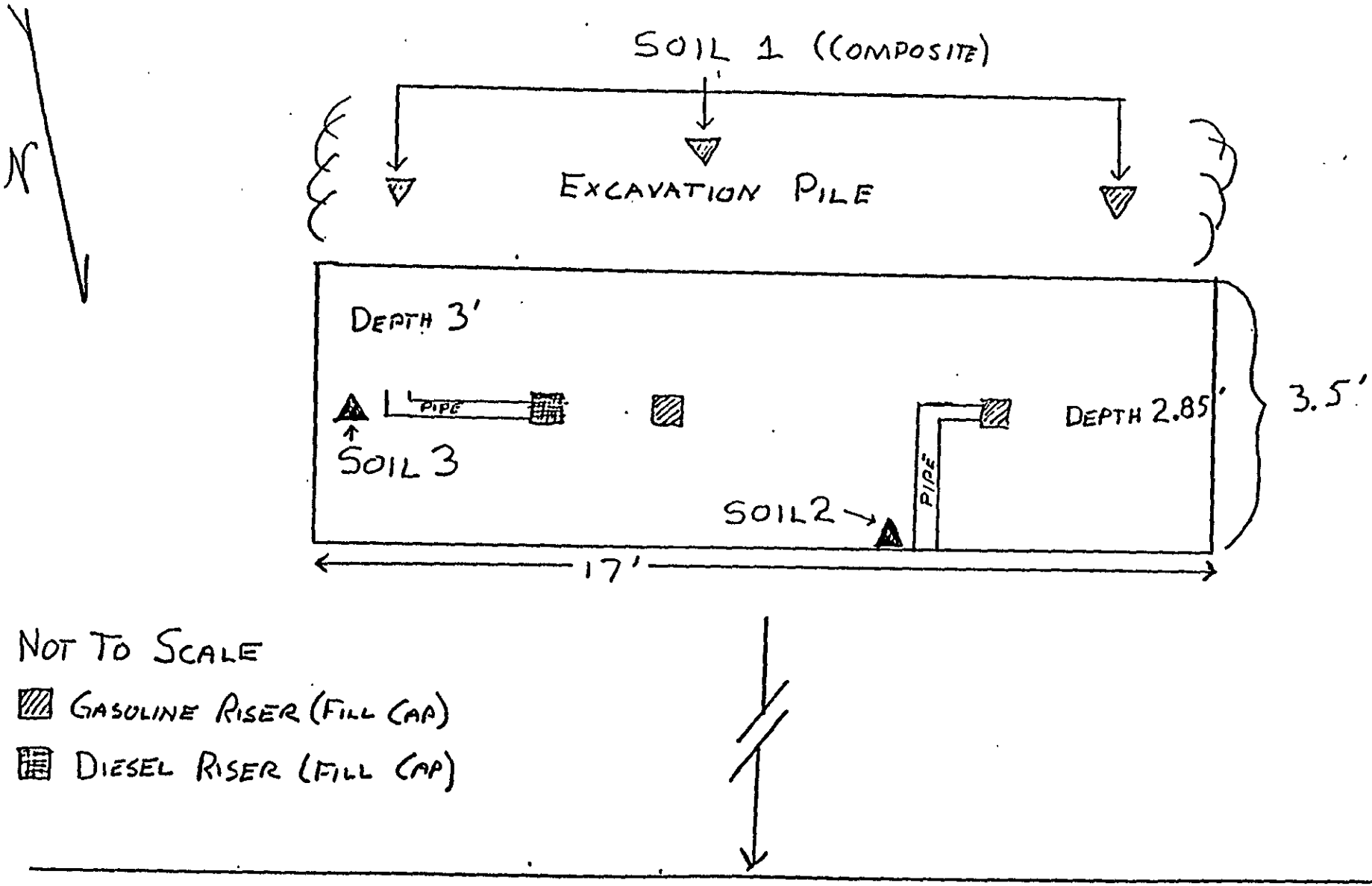

N
SOIL 1 (COMPOSITE)
EXCAVATION PILE
DEPTH 3'
PIPE
SOIL 3
SOIL 2
PIPE
DEPTH 2.85'
3.5'
17'
NOT TO SCALE
GASOLINE RISER (FILL CAP)
DIESEL RISER (FILL CAP)
SOUTHFRONT RD.

FIG 3

EMCON ASSOCIATES • CHEMICAL LABORATORIES
Analysis • Consultation • Research • Environmental Studies
State Approved Water Laboratory

EMCON

CERTIFIED ANALYTICAL REPORT

Project Number: 177-07

Livermore/Dublin Disposal
6715 South Front Road
Livermore, CA 94550

Table 1

Location: LIVERMORE, CALIFORNIA

Sample Type: SOIL
Units: mg/kg

Sample Designation:	SOIL 1	SOIL 2	SOIL 3
Field Date:	05/09/88	05/09/88	05/09/88
Laboratory Number:	E88-0479	E88-0479	E88-0479
Date Analyzed	5/10/88	5/10/88	5/10/88
Volatile Hydrocarbons due to Gasoline	<5	1700	<5
Benzene	<0.05	<1.2	<0.05
Toluene	<0.1	13	<0.1
Xylenes and Ethylbenzene	<0.4	140	<0.4

Reported by: [signature] Date: May [illegible]

1921 RINGWOOD AVENUE, SAN JOSE, CALIFORNIA 95131 TELEPHONE (408) 275-1444

Table 4.2 Summary of Soil Analytical Results, Livermore-Dublin Disposal Livermore, California

Soil Boring Number	Date	Depth (feet)	TPH-G (mg/kg)	TPH-D (mg/kg)	B (mg/kg)	T mg/kg)	X (mg/kg)	E mg/kg)
SB-2 (MW-5)	10/6/90	9.8 14.5	0.4 ND	ND 2	0.01 ND	0.01 ND	0.009 ND	0.01 ND
SB-4 (MW-6)	10/6/90	10.0 14.5	430 ND	9 4	4 ND	7.9 ND	34 ND	0.8 ND
SB-5	10/5/90	5.0 9.3 14.8	ND ND ND	ND 2 1	ND ND ND	ND ND ND	ND ND ND	ND ND ND
SB-6	10/5/90	4.2 9.5 15.0	ND ND ND	14 2 ND	ND ND ND	ND ND ND	ND ND ND	ND ND ND
SB-8 (MW-7)	10/6/90	9.7 14.4	1.8 ND	7 ND	0.11 ND	0.16 ND	0.16 ND	0.03 ND
MW-1	12/10/88	5	NA	NA	0.083	0.10	0.11	0.27
MW-1	12/10/88	10	NA	NA	5.0	16.0	28.0	6.70
MW-1	12/10/88	15	NA	NA	7.20	22.0	40.0	10.0
MW-1	12/10/88	25	NA	NA	0.42	0.72	0.63	0.15
MW-2	9/14/89	5	ND	ND	0.15	ND	ND	ND
MW-2	9/14/89	10	1400	39	23.0	100.0	150.0	22.0
MW-3	9/14/89	5	ND	ND	ND	ND	ND	ND
MW-3	9/14/89	10	ND	ND	ND	ND	ND	ND
MW-4	9/14/89	5	ND	ND	ND	ND	ND	ND
MW-4	9/14/89	10	2.7	ND	0.41	ND	1.20	0.48

TPH-D = Total Petroleum Hydrocarbons-Diesel, analyzed by U.S. Environmental Protection Agency (EPA) method 3550-8015 (mod).

TPH-G = Total Petroleum Hydrocarbons-Gasoline, analyzed by EPA method 5030/8015 (mod).

B = Benzene, Analyzed by EPA method 5030/8020.
T = Toluene, Analyzed by EPA method 5030/8020.
X = Total Xylene, Analyzed by EPA method 5030-8020.
E = Ethylbenzene, Analyzed by EPA method 5030/8020.
ND = Not Detected at the following detection limits:

Detection Limit:	SB-2 through SB-8	MW-1 - MW-4
TPH-G	0.1 mg/kg	10 mg/kg
TPH-D	1 mg/kg	10 mg/kg
BTXE	0.005 mg/kg	0.05 mg/kg*

* Detection limit for benzene, toluene and ethylbenzene only, detection limit for toluene = 0.01 mg/kg.

Table 3 Summary of Ground-Water Analytical Results, Livermore-Dublin Disposal, Livermore, California

Monitoring Well (MW) or Soil Boring (SB)[1]	Date[2]	TPH-G (mg/l)	TPH-D (mg/l)	B (µg/l)	T (µg/l)	X (µg/l)	E (µg/l)
MW-1	12/10/88	NA	NA	17,000	23,000	18,000	3,800
	8/16/90	61	1.0	9,000	6,300	3,500	860
	10/9/90	47	ND	4,300	3,500	2,100	450
MW-2	9/15/89	0.89	ND	1,300	1,200	890	220
	8/16/90	18	0.40	2,600	1,200	800	200
	10/9/90	17	ND	3,800	3,100	1,600	350
MW-3	9/15/89	ND	ND	ND	ND	ND	ND
	8/16/90	ND	0.24	ND	ND	ND	ND
	10/9/90	ND	ND	0.80	1.1	0.90	ND
MW-4	9/15/89	ND	ND	24.0	1.2	20.0	5.0
	8/16/90	0.20	ND	18.0	1.8	2.4	4.0
	10/9/90	ND	ND	14.0	2.2	5.0	3.0
MW-5	10/10/90	ND	ND	1.2	0.49	ND	ND
MW-6	10/9/90	3.8	ND	220	310	280	58
MW-7	10/8/90	0.96	ND	100	34	110	32
SB-1	10/4/90	2.0	ND	55	160	180	34
SB-2	10/4/90	ND	ND	ND	ND	ND	ND
SB-3	10/4/90	2.7	ND	430	390	290	63
SB-4	10/4/90	19	15	870	1500	1400	260
SB-5	10/5/90	ND	ND	ND	ND	ND	ND
SB-6	10/5/90	ND	ND	ND	ND	ND	ND
SB-8	10/5/90	ND	ND	ND	ND	ND	ND

1. Soil Boring water collected by Hydropunch™

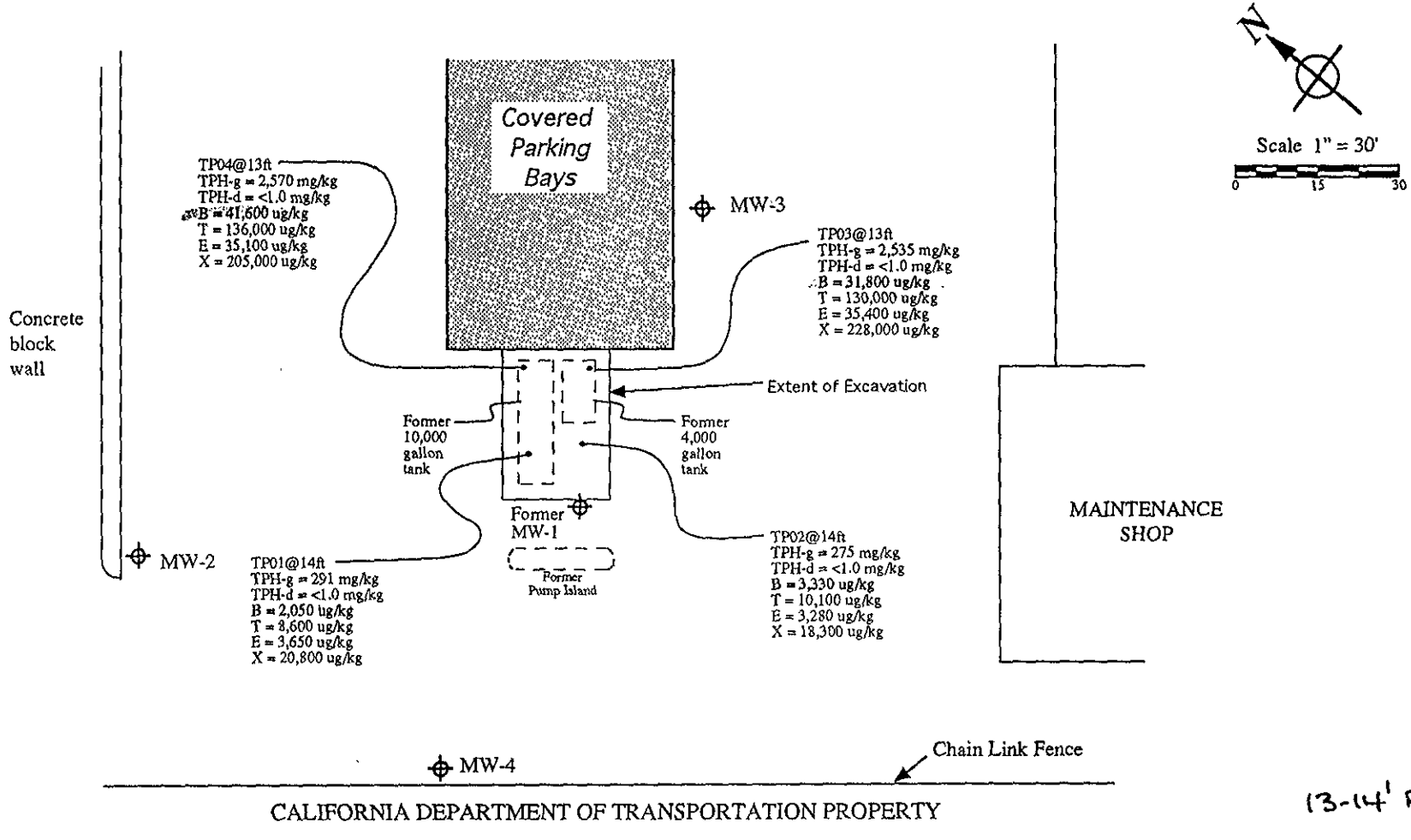
2. 12/10/88 Sampled by Hydro-Search, Inc. (Presented in "Additional Site Assessment Livermore-Dublin Disposal Livermore, California", dated December 6, 1989)
   9/15/89 Sampled by Hydro-Search, Inc.
   8/16/90 Sampled by California Water Labs
   10/4 to 10/10/90 Sampled by Hydro-Search, Inc.

Total Petroleum Hydrocarbons (TPH)-Gasoline (G) analyzed by Environmental Protection Agency (EPA) method 5030/8015 (mod).
TPH-Diesel (D) analyzed by EPA method 3510/8015 (mod)

The following were analyzed by EPA 8020/602 for all dates:

B = Benzene
T = Toluene
X = Total Xylenes
E = Ethylbenzene

NA = Not Analyzed
ND = Not Detected at the detection limits stated.



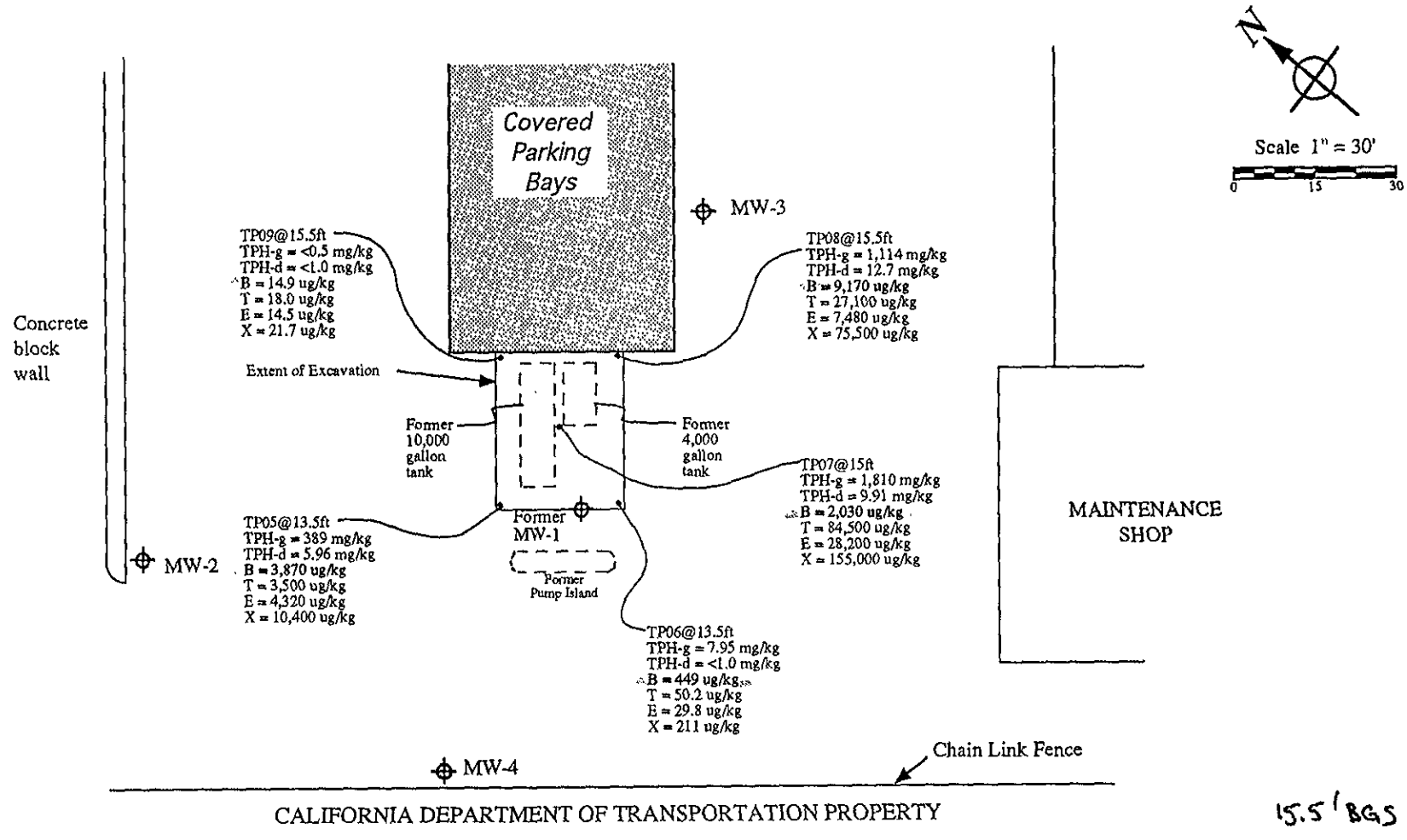
13-14' BGS

TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

SEC DONOHUE
Environment & Infrastructure
42840 Christy Street, Suite 201, Fremont, California 94538

FIGURE 2b
Excavation Configuration & Sample Location Map
Samples Collected April 24, 1992
Livermore-Dublin Disposal Company
6175 South Front Road, Livermore, CA

W2564\SAMPLOC



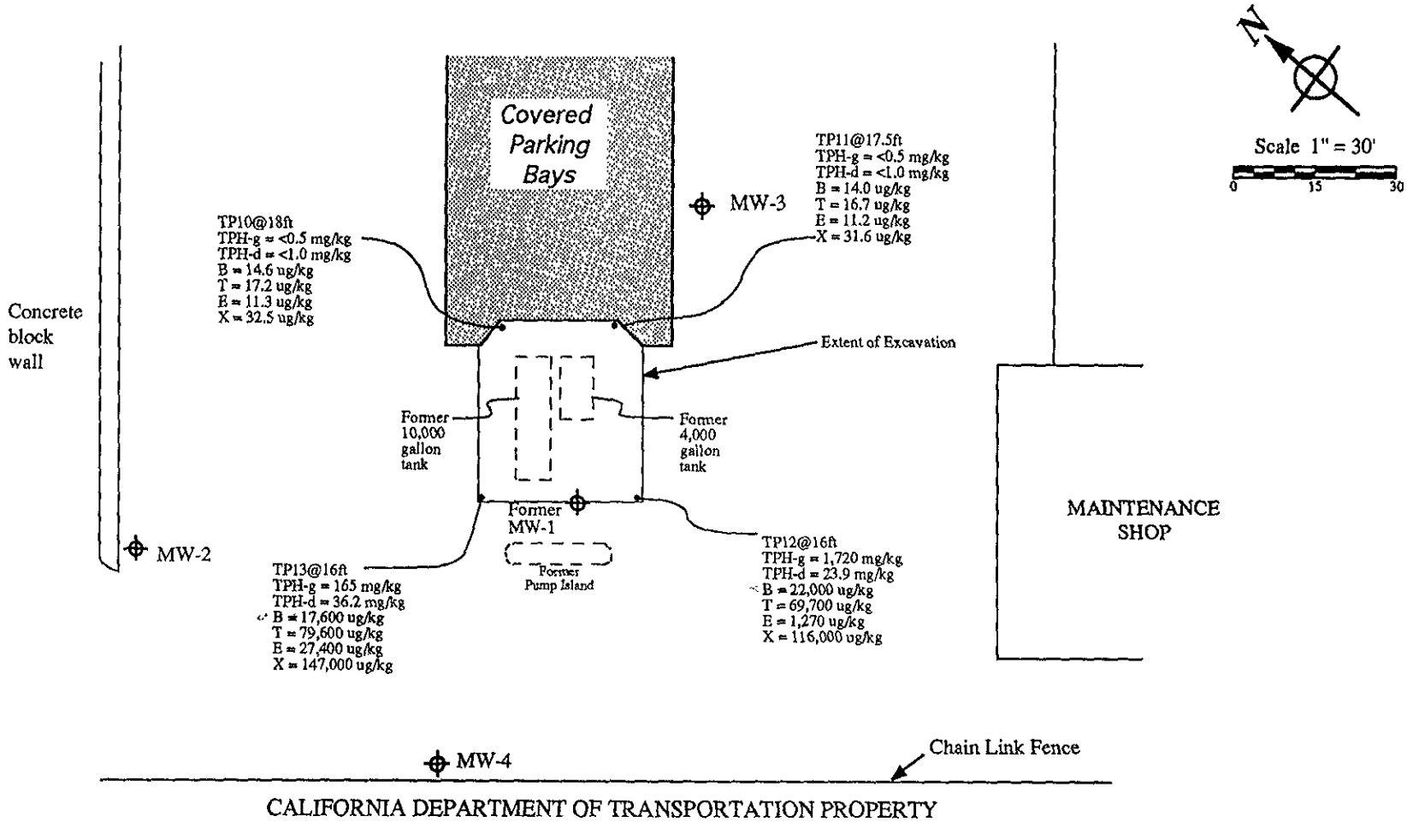
15.5' BGS

TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

SEC DONOHUE
Environment & Infrastructure
42840 Christy Street, Suite 201, Fremont, California 94538

FIGURE #7
Excavation Configuration & Sample Location Map
Samples Collected May 2, 1992
Livermore-Dublin Disposal Company
6175 South Front Road, Livermore, CA

W2564\SAMPLOC

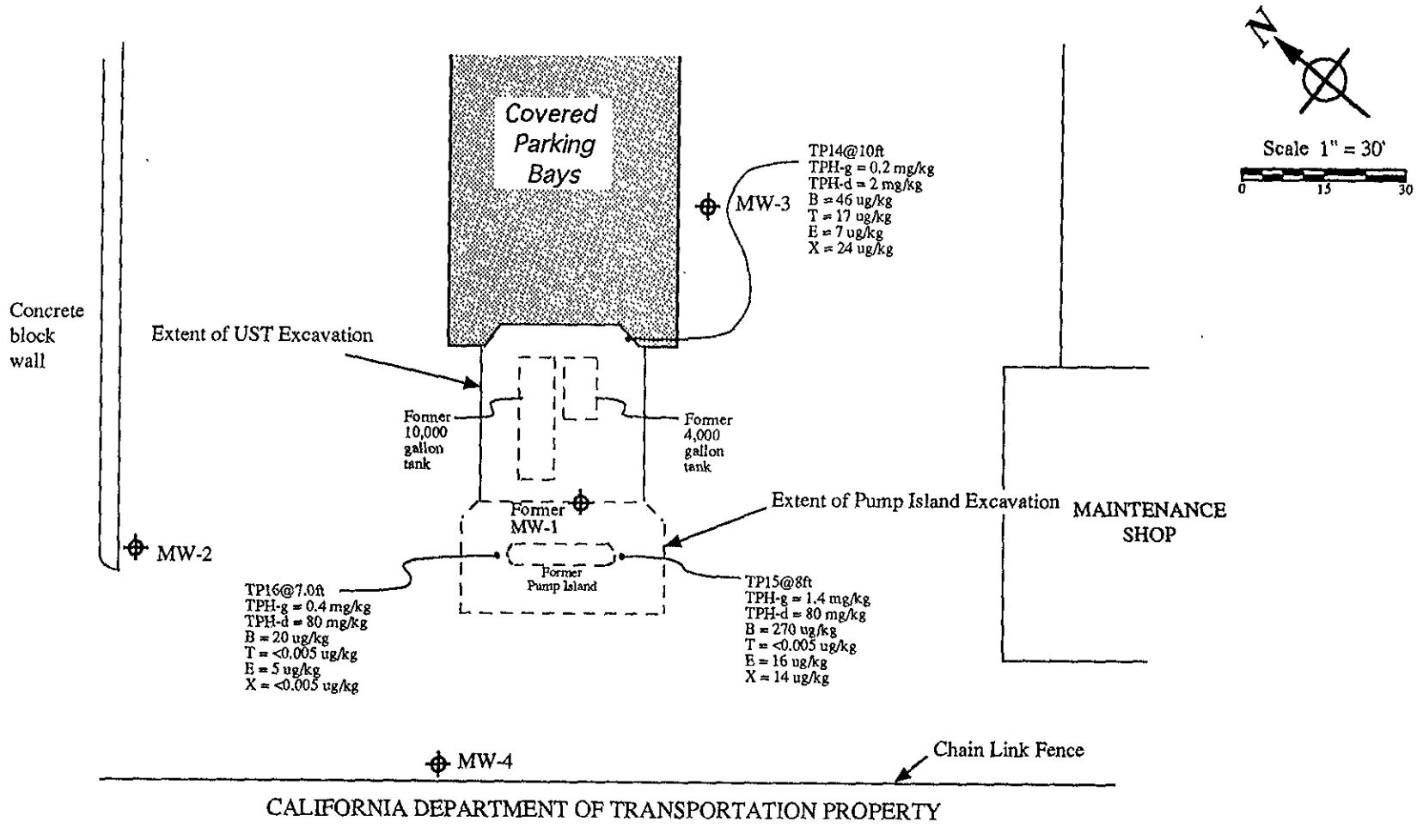


TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

SEC DONOHUE
Environment & Infrastructure
42840 Christy Street, Suite 201, Fremont, California 94538

FIGURE 6 8
Excavation Configuration &
Sample Location Map
Samples Collected May 17, 1992
Livermore-Dublin Disposal Company
6175 South Front Road, Livermore, CA

W2564\SAMPLOC

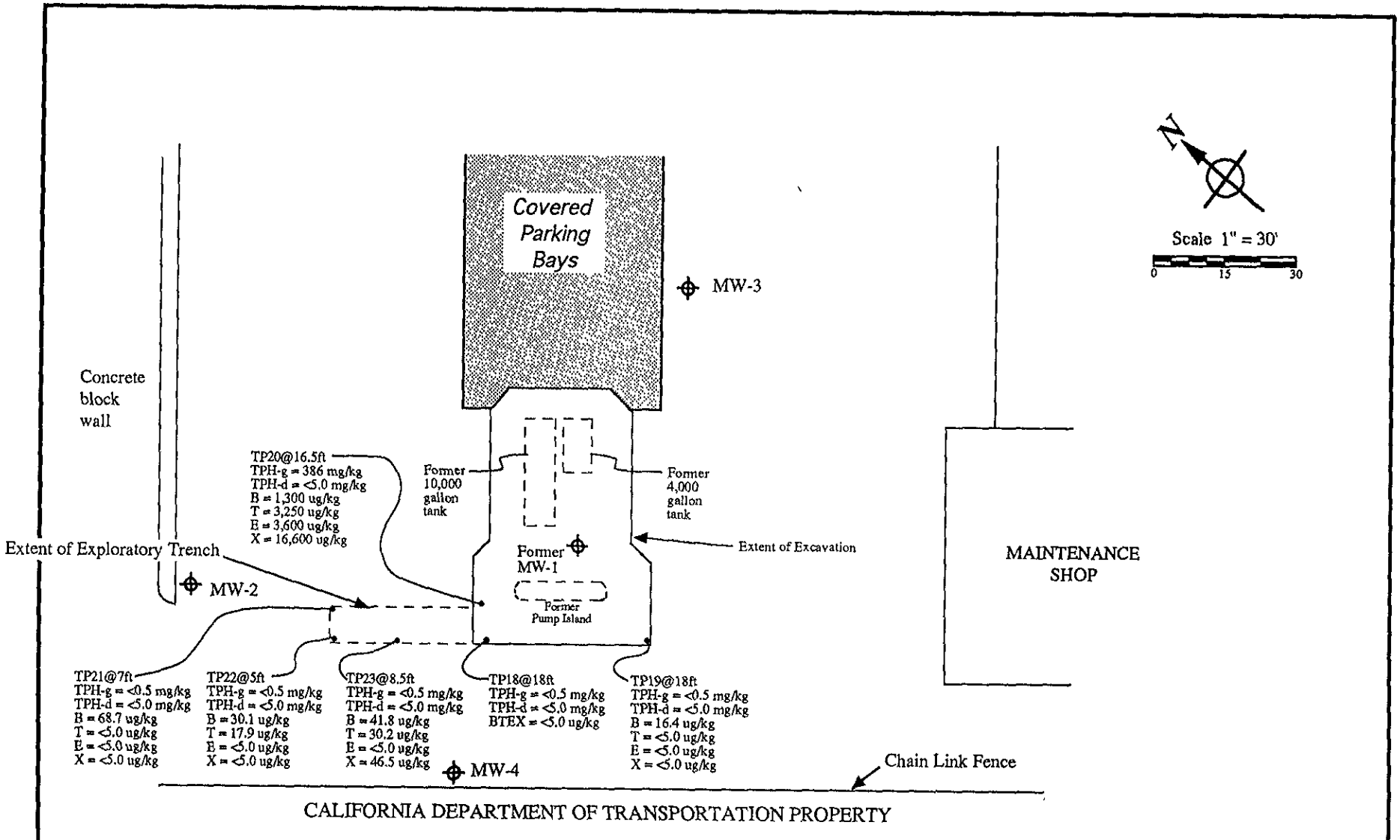


TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

SEC DONOHUE
Environment & Infrastructure
42840 Christy Street, Suite 201, Fremont, California 94538

FIGURE #9
Excavation Configuration &
Sample Location Map
Samples Collected May 19, 1992
Livermore-Dublin Disposal Company
6175 South Front Road, Livermore, CA

W2564\SAMPLOC



TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

SEC DONOHUE
Environment & Infrastructure
42840 Christy Street, Suite 201, Fremont, California 94538

FIGURE # 10
Excavation Configuration &
Sample Location Map
Samples Collected July 14, 1992
Livermore-Dublin Disposal Company
6175 South Front Road, Livermore, CA

W2564\SAMPLOC

Table 4

Table 1. Summary of Analytical Laboratory Results
Tank Excavation
Livermore Dublin Disposal Facility

Date Collected	Time	Depth (feet)	Sample Identification	Location in Excavation	TPH-G mg/kg (1)	TPH-D mg/kg (2)	Benzene ug/kg (3)	Toluene ug/kg (3)	Ethyl benzene ug/kg (3)	Total Xylenes ug/kg (3)	Action Taken
4/24/92	16:40	14.0	TP01	Northwest Corner	291.0	(1.0)	2,050	8,600	3,650	20,800	Excavated
5/02/92	16:10	13.5	TP05	Northwest Corner	389.013	5.96	3,870	3,500	4,320	10,400	Excavated
5/17/92	18:15	16.0	TP13	Northwest Corner	165.0	36.2	17,600	79,600	27,400	147,000	Excavated
5/19/92	18:05	7.0	TP16	N End - Pump Island Excavation	0.4	80	20	5	(5)	(5)	Excavated
7/14/92	10:15	18.0	TP18	Northwest Corner	(0.5)	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	Not Excavated
4/24/92	16:15	14.0	TP02	Southwest Corner	275.0	(1.0)	3,300	10,100	3,280	18,300	Excavated
5/02/92	16:15	13.5	TP06	Southwest Corner	7,950	(1.0)	449	50.2	29.8	211	Excavated
5/17/92	17:55	16.0	TP12	Southwest Corner	1,720	23.9	22,000	69,700	1,270	116,000	Excavated
5/19/92	16:50	8.0	TP15	S End - Fuel Island Excavation	1.4	80	270	16	(5)	14	Excavated
7/14/92	10:20	18.0	TP19	Southwest Corner	(0.50)	(5.0)	16.4	(5.0)	(5.0)	(5.0)	Not Excavated
4/24/92	16:23	13.0	TP03	Southeast Corner	2,535	(1.0)	31,800	130,000	35,400	228,000	Excavated
5/02/92	16:30	15.5	TP08	Southeast Corner	1,114	12.7	9,170	27,100	7,480	75,500	Excavated
5/17/92	15:15	17.5	TP11	Southeast Corner	(0.50)	(1.0)	14.0	16.7	11.2	31.6	Not Excavated
4/24/92	16:40	13.0	TP04	Northeast Corner	2,570	(2.0)	41,600	136,000	35,100	205,000	Excavated
5/02/92	16:15	15.5	TP09	Northeast Corner	(0.50)	(1.0)	14.9	18.0	14.5	21.7	Excavated
5/17/92	15:00	18.0	TP10	Northeast Corner	(0.50)	(1.0)	14.6	17.2	11.3	32.5	Not Excavated
5/02/92	16:20	15.0	TP07	Center	1,810	9.91	2,030	84,500	28,200	155,000	Excavated
5/19/92	13:50	10.0	TP14	Southeast Corner Sidewall	(0.2)	2	46	7	17	24	Not Excavated
				EXPLORATORY TRENCH (ET)							
7/14/92	10:25	16.5	TP20	North Sidewall @ base of ET	386.0	(5.0)	1,300	3,250	3,600	16,600	Not Excavated
7/14/92	14:20	7.0	TP21	Northeast Corner of ET	(0.5)	(5.0)	68.7	(5.0)	(5.0)	(5.0)	Not Excavated
7/14/92	14:30	5.0	TP22	Northwest Corner of ET	(0.5)	(5.0)	30.1	17.9	(5.0)	(5.0)	Not Excavated
7/14/92	14:45	8.5	TP23	West Sidewall of ET	(0.5)	(5.0)	41.8	30.2	(5.0)	46.5	Not Excavated

Notes:

mg/kg = milligram per kilogram equivalent to parts per million (ppm); ug/kg microgram per kilogram equivalent to parts per billion (ppb); NA = Not Applicable.

(1) TPH-G: Total petroleum hydrocarbons as gasoline analyzed using EPA Test Method Modified 8015/5030.

(2) TPH-D: Total petroleum hydrocarbons as diesel analyzed using EPA Test Method Modified 8015/3550. Samples were also analyzed by the analytical laboratory for TPH as motor oil and kerosene (Appendix E).

(3) Benzene, Toluene, Ethyl benzene, and Total Xylenes analyzed using EPA Test Method 8020.

TABLE 5

ANALYTICAL DATA SUMMARY

LIVERMORE-DUBLIN DISPOSAL FACILITY
LIVERMORE, CALIFORNIA

Well I.D.	Sample Date	TRPH (µg/L)	TEPH-D (µg/L)	TPPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes Total (µg/L)	MTBE (µg/L)
MW-1	8/16/90	NA	1,000	61,000	9,000	6,300	860	3,500	NA
MW-1	2/14/91	<5,000	5,300	14,000	3,600	2,300	400	2,400	NA
MW-1	5/14/91	NA	<500	16,000	2,900	2,100	85	1,000	NA
MW-1	12/12/91	NA	340	7,400	2,400	450	10	450	NA
MW-1	2/6/92	<5,000	4,000	13,000	2,500	1,400	160	850	NA
MW-2	8/16/90	NA	400	18,000	2,600	1,200	200	800	NA
MW-2	2/14/91	<5,000	5,400	13,000	2,800	2,100	420	3,500	NA
MW-2	5/14/91	NA	<500	12,000	6,200	460	190	410	NA
MW-2	12/12/91	NA	720	14,000	4,900	1,500	<10	4,300	NA
MW-2	2/6/92	<5,000	620	7,600	2,900	450	120	930	NA
MW-2	6/17/92	<5,000	500	2,700	740	32	9	93	NA
MW-2	8/17/92	<5,000	140	2,900	670	12	13	65	NA
MW-2	11/20/92	<5,000	120	480	190	17	9.2	16	NA
MW-2	2/22/93	<5,000	<50	120	<0.3	<0.3	<0.3	1.2	NA
MW-2	5/20/93	27,000	<100	8,400	780	150	25	450	NA
MW-2	8/17/93	<5,000	<50	320	<12	<3	<3	<6	NA
MW-2	11/16/93	**	**	**	**	**	**	**	NA
MW-2	2/24/94	<1,000	<50	1,400	320	38	72	61	NA
MW-2	5/13/94	<1,000	<50	370	10	1.8	0.3	5.8	NA
MW-2	8/16/94	<1,000	<50	80	1.5	0.7	<0.3	4.4	NA
MW-2	11/8/94	<1,000	<50	<50	0.8	<0.3	<0.3	<0.6	NA
MW-2	1/30/95	1,200	<50	660	240	14	52	53	NA
MW-2	5/2/95	13,000	<50	700	470	24	41	92	NA
MW-2	8/2/95	<1,000	<50	140	30	0.38	2.9	11	NA
MW-2	10/31/95	1,500	<50	2,800	1,500	9.2	74	43	NA
MW-2	3/14/96	<1,000	1,200	5,100	1,400	<20	260	140	NA
MW-2	6/14/96	<1,000	390	700	140	<5	29	33	NA
MW-2	3/27/97	<1,100	200	<50	9.1	<0.50	2.6	0.96	NA
MW-2	11/7/97	<5,000	120	<50	1.5	<0.50	<0.50	<0.50	<2.5

TABLE 5 (Continued)

ANALYTICAL DATA SUMMARY

LIVERMORE-DUBLIN DISPOSAL FACILITY
LIVERMORE, CALIFORNIA

Well I.D.	Sample Date	TRPH (µg/L)	TEPH-D (µg/L)	TPPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes Total (µg/L)	MTBE (µg/L)
MW-3	8/16/90	NA	240	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	2/14/91	<5,000	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	5/14/91	NA	60	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	12/12/91	NA	50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	2/6/92	<5,000	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	6/17/92	<5,000	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	8/17/92	<5,000	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	11/20/92	<5,000	<50	<50	1.8	7.2	0.75	4.4	NA
MW-3	2/22/93	<5,000	<100	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-3	5/20/93	<5,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-3	8/17/93	<5,000	<100	<50	<0.3	<0.3	<0.3	<0.3	NA
MW-3	11/16/93	<1,100	<50	<50	<0.3	<0.3	<0.3	<0.5	NA
MW-3	2/24/94	<1,000	<51	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-3	5/13/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-3	8/16/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-3	11/8/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-3	1/30/95	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-4	8/16/90	NA	<100	200	18	1.8	4	2.4	NA
MW-4	2/14/91	<5	<50	<50	1.5	<0.5	<0.5	<0.5	NA
MW-4	5/14/91	NA	<50	<50	1.1	<0.5	<0.5	<0.5	NA
MW-4	12/12/91	NA	60	140	<0.5	0.6	11	2.6	NA
MW-4	2/6/92	<5,000	<50	120	51	0.6	5.9	1.6	NA
MW-4	6/17/92	<5,000	60	200	11	0.5	3.9	1.5	NA
MW-4	8/17/92	<5,000	<50	74	4.1	<0.5	1.9	1.9	NA
MW-4	11/20/92	<5,000	<50	70	4.5	6.6	3.7	4.2	NA
MW-4	2/22/93	<5,000	<50	420	25	<0.3	9.7	2.4	NA
MW-4	5/20/93	<5,000	<100	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-4	8/17/93	<5,000	<50	280	<3	<3	<3	<6	NA
MW-4	11/16/93	<1,020	<51	160	4.9	<0.3	2.62	0.942	NA
MW-4	2/24/94	<1,000	<50	70	1.9	<0.3	1.6	<0.6	NA
MW-4	5/13/94	<1,000	<50	210	2.3	<0.3	2.8	0.9	NA
MW-4	8/16/94	<1,000	<50	33	4.1	2.1	7.6	2.6	NA
MW-4	11/8/94	<1,000	<50	120	0.67	<0.3	1.5	<0.6	NA

TABLE 5 (Continued)

ANALYTICAL DATA SUMMARY

LIVERMORE-DUBLIN DISPOSAL FACILITY
LIVERMORE, CALIFORNIA

Well I.D.	Sample Date	TRPH (µg/L)	TEPH-D (µg/L)	TPPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Xylenes Total (µg/L)	MTBE (µg/L)
MW-4	1/30/95	<1,000	<50	<50	0.41	<0.3	0.46	<0.6	NA
MW-4	8/2/95	<1,000	<50	<50	0.37	<0.3	0.33	<0.6	NA
MW-4	3/14/96	<1,000	69	130	1.6	<0.50	1.3	<0.50	NA
MW-4	3/27/97	<1,100	120	130	<0.50	0.52	1.2	<0.50	NA
MW-4	11/7/97	<5,000	71	<50	<0.50	<0.50	<0.50	<0.50	<2.5
MW-5	2/14/91	<5,000	<50	<50	<50	<50	<50	<50	NA
MW-5	5/14/91	NA	100	<50	<50	<50	<50	<50	NA
MW-5	12/12/91	NA	410	64,000	490	140	10	1,500	NA
MW-5	2/6/92	<5,000	<50	<50	<50	<50	<50	<50	NA
MW-5	6/1792	<5,000	<50	<50	<50	<50	<50	<50	NA
MW-5	8/17/92	<5,000	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-5	11/20/92	<5,000	<50	<50	1.6	6.8	0.66	3.9	NA
MW-5	2/22/93	<5,000	<50	80	2.6	53	0.6	1.3	NA
MW-5	5/20/93	<5,000	<100	160	5.7	0.4	3.8	8.3	NA
MW-5	8/17/93	<5,000	<50	<50	<0.3	<0.3	<0.3	<0.3	NA
MW-5	11/16/93	<1,110	<51.5	<50	<0.3	<0.3	<0.3	<0.5	NA
MW-5	2/24/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-5	5/13/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-5	8/16/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-5	11/18/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-5	1/30/95	4.3	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-5	3/14/96	<1,000	120	79	<0.50	<0.50	3.7	1.4	NA
MW-5	3/27/97	<1,100	120	<50	<0.50	<0.50	2.3	<0.50	NA
MW-5	11/7/97	<5,000	<50	<50	<0.50	<0.50	<0.50	<0.50	<2.5
MW-6	2/14/91	<5,000	1,400	2,900	580	420	110	990	NA
MW-6	5/14/91	NA	<50	1,600	360	36	31	42	NA
MW-6	12/12/91	NA	<50	<50	>0.5	<0.5	<0.5	<0.5	NA
MW-6	2/6/92	<5,000	560	3,000	560	93	31	290	NA
MW-6	6/17/92	<5,000	90	610	49	2.8	5.6	12	NA
MW-6	8/17/92	<5,000	340	790	50	3.9	6.7	32	NA
MW-6	11/20/92	<5,000	260	980	96	12	14	14	NA

TABLE 5 (Continued)

ANALYTICAL DATA SUMMARY

LIVERMORE-DUBLIN DISPOSAL FACILITY
LIVERMORE, CALIFORNIA

Well I.D.	Sample Date	TRPH (µg/L)	TEPH-D (µg/L)	TPPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes Total (µg/L)	MTBE (µg/L)
MW-6	2/22/93	<5,000	<50	3,300	810	<0.3	2.6	520	NA
MW-6	5/20/93	<5,000	<100	4,600	370	5.6	4.4	190	NA
MW-6	8/17/93	<5,000	<50	650	<3	<3	<3	<6	NA
MW-6	11/16/93	<1.06	<50.5	328	11.2	<0.3	2.21	4.74	NA
MW-6	2/24/94	1,100	<50	1,900	240	2.7	93	290	NA
MW-6	5/13/94	1,200	<50	330	6.6	0.4	0.4	18	NA
MW-6	8/16/94	2,900	<50	<50	43	0.31	<0.3	0.61	NA
MW-6	11/8/94	<1,000	<50	260	14	1.1	1.7	2.9	NA
MW-6	1/30/95	<1,000	<50	<50	3.4	<0.3	0.45	0.75	NA
MW-6	5/2/95	12	<50	620	91	0.80	93	45	NA
MW-6	8/2/95	<1,000	<50	110	3.3	<0.3	3.5	<0.6	NA
MW-6	10/31/95	<1,000	<50	210	26	<0.3	4.7	7.2	NA
MW-6	3/14/96	<1,000	1,600	2,700	210	<10	100	66	NA
MW-6	6/14/96	<1,000	310	720	52	<5	26	9.8	NA
MW-6	3/27/97	<1,100	700	700	<5.0	40	12	7.6	NA
MW-6	11/7/97	<5,000	370	220	5.8	<0.50	1.5	0.51	2.8
MW-7	2/14/91	NA	110	200	11	1.5	14	62	NA
MW-7	5/14/91	NA	100	63	4	0.6	0.9	1.5	NA
MW-7	12/12/91	NA	<50	60	<0.5	<0.5	1.5	0.6	NA
MW-7	2/6/92	<5,000	60	290	3.6	2.3	7.1	14	NA
MW-7	6/17/92	<5,000	60	150	8.5	0.6	8.6	5	NA
MW-7	8/17/92	<5,000	50	69	4.1	0.82	1.2	4.8	NA
MW-7	2/22/93	<5,000	<50	960	44	<0.3	2	38	NA
MW-7	5/20/93	<5,000	<100	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-7	8/17/93	<5,000	<50	100	<3	<3	<3	<6	NA
MW-7	11/16/93	<1,050	<53.2	171	0.922	<0.3	1.96	<0.5	NA
MW-7	2/24/94	<1,000	<50	160	5.8	<0.3	2.5	12	NA
MW-7	5/13/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-7	8/16/94	<1,000	<50	<50	0.37	0.33	<0.3	<0.6	NA
MW-7	11/8/94	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-7	1/30/95	<1,000	<50	<50	<0.3	<0.3	0.37	<0.6	NA

TABLE 5 (Continued)

ANALYTICAL DATA SUMMARY

LIVERMORE-DUBLIN DISPOSAL FACILITY
LIVERMORE, CALIFORNIA

Well I.D.	Sample Date	TRPH (µg/L)	TEPH-D (µg/L)	TPPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes Total (µg/L)	MTBE (µg/L)
MW-7	8/2/95	<1,000	<50	<50	<0.3	<0.3	<0.3	<0.6	NA
MW-7	3/14/96	<1,000	380	490	2.4	<1.2	25	6.1	NA
MW-7	3/27/97	<1,100	230	160	1.4	<1.0	7.8	2	NA
MW-7	11/7/97	<5,000	74	110	1.2	<0.50	5.1	1.3	<2.5

Notes:

Total Petroleum Hydrocarbons and Oil and Grease were analyzed using USEPA Methods 413.2, 418.1, 3510, and SM5520B.
Total Extractable Petroleum Hydrocarbons as Diesel were analyzed using USEPA Method Modified 8015/3510.
Total Purgeable Petroleum Hydrocarbons as Gasoline were analyzed using USEPA Methods 602/5030, 8015Mod/8020, or 624.

**	Groundwater sample not collected from MW-2 on November 16, 1993 because extraction pump was out of operation.
NA	Not Analyzed.
<5,000	Not detected at or above stated detection limit.
µg/L	Micrograms per liter.

SOIL BOREHOLE LOG

SITE NAME AND LOCATION

Livermore-Dublin Disposal Company
6175 South Frontage Road
Livermore, California

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split-spoon

BORING NO. M-1

SHEET 1 OF 1

DRILLING

		War.	Prod.		START TIME	FINISH TIME
WATER LEVEL	10.50	10.37	10.28			
TIME	1230	1552			0730	1330
DATE	12/10	12/10			DATE 12/10	DATE 12/10
CASING DEPTH	30'	30'				

DATUM ELEVATION

DRILL RIG Mobile B-57

SURFACE CONDITIONS Steel-reinforced concrete

ANGLE vertical BEARING

SAMPLE HAMMER TORQUE FT.-LBS

DRILLING CONTR. Trace Env.

DEPTH IN FEET (ELEVATION)	BLOWS/ 6 IN. ON SAMPLER (RECOVERY)	HNU	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	TEST RESULTS: WATER CONTENT %	LIQUID LIMIT %	PLASTIC LIMIT %	SPCIFIC GRAVITY	OTHER TESTS
0-1			Steel-reinforced concrete, baserock								
			Clay, dark green (CL), medium pack, slight hydrocarbon odor, dry								
5	100%	6	Silt, brown (ML), loose pack, damp, hydrocarbon odor, trace of sand								
10 ▼	100%	50	Clay, light brown (CL), medium pack, strong hydrocarbon odor, saturated								
15	100%	90	Clay, light brown (CL), loose pack, saturated, strong hydrocarbon odor, trace sand								
20	NR	NR	Sand, tan (SP), fine grained, loose pack, saturated, no hydrocarbon odor								
25	65%	2	Sandy Clay, tan (CL), hard pack, saturated, no hydrocarbon odor								
30	35%	0	Total Depth of Borehole: 30 feet								
35											

LOGGED BY Mark Hudson

DATE 12/10/88 CHK'D BY

SL02212

DRILLING LOG

Project: Livermore-Dublin Disp Owner: WMNA Well Number : MW-2

Location: Livermore, CA Project Number: 109E29011

Date Drilled: 9-14-89	Screen Diam.: 4-inch	Drilling Co: West-Hazmat Drilling
Total Depth: 32 feet	Length: 25 feet	Method: Hollow stem auger
Diameter: 10-inch	Slot Size: 0.020-inch	Driller: Scott
Surface Elev.: 536.91	Casing Diam: 4-inch	Log by: M. Hudson
Initial Water Level: 10.3 feet	Length: 6 feet Type:sch 40 PVC	

SAMPLE	BLOW COUNT	PID ppm	WELL CONST.	DEPTH (ft)	LOG	DESCRIPTION
						Surface: ASPHALT
						Fill: Baserock
				2		Silty clay, (CL), Olive gray (5YR3/2), dry, plastic, slight hydrocarbon odor
				4		
5.0	28	5		6		Clayey silt (ML), moderate brown (5YR3/2), dry, friable slight hydrocarbon odor
				8		Silty clay (CL), olive gray (5Y3/2), saturated, plastic, strong hydrocarbon odor First water at 10.3 feet Below 10 feet hydrocarbon odor decreases with depth No hydrocarbon odor below 13 feet
10.0	12	100		10		
				12		
				14		
15.0	14	2		16		Silty clay (CL), moderate yellowish brown (10YR5/4), saturated, soft, no hydrocarbon odor
				18		
20.0	18	0		20		
				22		
				24		
25.0	15	0		26		
				28		
30.0	19	0		30		
				32		Total Depth = 32 feet

DRILLING LOG

Project: Livermore-Dublin Disp Owner: WMNA Well Number : MW-3

Location: Livermore, CA Project Number: 109E29011

Date Drilled: 9-14-89	Screen Diam.: 2-inch	Drilling Co: West-Hazmat Drilling
Total Depth: 32 feet	Length: 25 feet	Method: Hollow stem auger
Diameter: 8-inch	Slot Size: 0.020-inch	Driller: Scott
Surface Elev.: 538.55	Casing Diam: 2-inch	Log by: M. Hudson
Initial Water Level: 11.25 feet	Length: 7 feet Type: sch 40 PVC	

SAMPLE DEPTH	BLOW COUNT	PID ppm	WELL CONST.	DEPTH (ft)	LOG	DESCRIPTION
						Surface: ASPHALT
						Fill: Baserock
				2		Silty clay, (CL), Olive gray (5YR3/2), dry, plastic, no hydrocarbon odor, stiff
				4		
5.0	28	0		6		Silty clay (CL), dusty yellow (5Y6/4), dry, friable, no hydrocarbon odor, stiff
				8		Sandy clay (CL), olive gray (5Y3/2), saturated at 11.25 feet, soft, no hydrocarbon odor
10.0	11	0		10		
				12		Clayey silt (ML), moderate brown (5YR3/4), saturated stiff, no hydrocarbon odor
				14		Silty Clay (CL), moderate yellowish brown (10YR5/4), saturated, no hydrocarbon odor
15.0	15	0		16		
				18		
20.0	18	0		20		
				22		
				24		
25.0	12	0		26		
				28		
30.0	19	0		30		
				32		Total Depth = 32 feet

DRILLING LOG

Project: Livermore-Dublin Disp Owner: WMNA Well Number : MW-4

Location: Livermore, CA Project Number: 109E29011

Date Drilled: 9-14-89	Screen Diam.: 4-inch	Drilling Co: West-Hazmat Drilling
Total Depth: 32 feet	Length: 25 feet	Method: Hollow stem auger
Diameter: 10-inch	Slot Size: 0.020-inch	Driller: Scott
Surface Elev.: 537.84	Casing Diam: 4-inch	Log by: M. Hudson
Initial Water Level: 11.0 feet	Length: 6 feet Type:sch 40 PVC	

SAMPLE	BLOW COUNT	PID ppm	WELL CONST.	DEPTH (ft)	LOG	DESCRIPTION
						Surface: ASPHALT
						Fill: Baserock
				2		Silty clay, (CL), Olive gray (5Y3/2), dry, plastic, no hydrocarbon odor, stiff
5.0	22	0		4		
				6		Clayey silt (ML), moderate brown (5YR3/4), dry, friable, no hydrocarbon odor
				8		
10.0	12	5		10		Sandy silt (ML), moderate brown (5YR3/4), moist, some gravel, soft, no hydrocarbon odor First water at 11.0 feet
				12		Silty clay (CL), moderate yellow brown (10YR5/4), saturated, plastic, soft, no hydrocarbon odor
15.0	16	0		14		
				16		
				18		
20.0	18	0		20		
				22		
				24		
25.0	11	0		26		
				28		
				30		
30.0	19	0		32		
						Total Depth = 32 feet

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
RENO-DENVER-MILWAUKEE-IRVINE

DRILLING LOG

WELL NUMBER SB-2 (MW-5) Page 1 of 1

Project Livermore-Dublin Disposal Owner WMNA

Location Livermore, Ca. Project Number 409E39011

Date Drilled 10/6/90 Total Depth of Hole 30' Diameter 10"

Surface El. 537.45 Water Level Initial _____ 24 hrs. _____

Screen: Dia. 4" Length 25' Slot Size 0.020"

Casing: Dia. 4" Length 4.3' Type PVC Sch. 40

Drilling Company West Hazmat Drilling Corp. Drilling Method Hollow Stem Auger -Continuous Core

Driller Mark Thorp Log by R.J.Johnson

Sketch Map

Notes

Sample Depth (ft.)	Recovery	H-NU	Depth (ft)	Log	DESCRIPTION
			0		Asphalt
0				Fill	Baserock
	45%		2	CL	Silty clay (CL): dark grayish brown (2.5Y4/2), slightly moist, very stiff, low plasticity, no product odor.
3			4	CL	Silty clay (CL): very dark grayish brown (2.5Y3/2), moist, very stiff, medium plasticity, no product odor, 10% fine grained sand
	60%	1.8	6	CL	Silty clay (CL): Light olive brown (2.5Y5/4), moist, very stiff, medium plasticity, no product odor, 20% fine-grained sand.
8			8	CL	Sandy clay (CL): as described above, except medium stiff and 30% sand.
	85%	3.4	10	CL	Silty clay (CL): olive (5Y5/3), saturated, soft, medium plasticity no product odor.
			12	CL	Silty clay (CL): light yellowish brown (2.5Y6/4), saturated, stiff, medium plasticity, no product odor, 20% fine-grained sand.
13			14	CL	Sandy clay (CL): as described above, except light olive brown (2.5Y5/4) and 30% fine-grained sand.
	50%	0.2	16	SC	Clayey sand (SC): light olive brown (2.5Y5/6) saturated, soft, nonplastic, no product odor, 80% fine-grained sand, 20% clay.
18			18		
	55%		20	SP	Sand (SP): light olive brown (2.5Y5/4), saturated, loose, no product odor, fine-to medium-grained sand.
23			22		
	85%	0.0	24		
			26	SC	Clayey sand (SC): light olive brown (2.5Y5/6), saturated, very low plasticity, no product odor, 80% fine-grained sand, 20% clay.
28			28	CL	Silty clay (CL): olive yellow (2.5Y6/6), saturated, very stiff, medium plasticity, no product odor.
			30		

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
RENO-DENVER-MILWAUKEE-IRVINE

DRILLING LOG

WELL NUMBER SB-4 (MW-6) Page 1 of 1

Project Livermore-Dublin Disposal Owner WMNA

Location Livermore, Ca. Project Number 409E39011

Date Drilled 10/6/90 Total Depth of Hole 30' Diameter 10"

Surface El. 536.96 Water Level Initial _____ 24 hrs. _____

Screen: Dia. 4" Length 25' Slot Size 0.020"

Casing: Dia. 4" Length 4.0' Type PVC Sch. 40

Drilling Company West Hazmat Drilling Corp. Drilling Method Hollow Stem Auger -Continuous Core

Driller Mark Thorp Log by R.J.Johnson

Sketch Map

Notes

Sample Depth (ft.)	Recovery	H-NU	Depth (ft)	Log	DESCRIPTION
			0		Surface Asphalt
0				Fill	Baserock
	15%		2	CL	Silty Clay (CL): olive (5Y5/4), slightly moist, medium stiff, medium plasticity, no product odor, 20% fine-grained sand.
3		9.8	4		
	25%		6		
8			8	CL	Silty Clay (CL): light olive brown (2.5Y5/4), moist, soft, medium plasticity, moderate product odor.
	65%	106	10		
			12	CL ▼	Silty Clay (CL): light olive brown (2.5Y5/4), moist, stiff, medium plasticity, moderate product odor, 10% fine-grained sand.
13			14		
	40%	10.6	16	SP	Sand (SP): light olive brown (2.5Y5/6), saturated, loose, no product odor, fine-grained sand.
18			18		
	75%	0.2	20	CL	Silty Clay (CL): light olive brown (2.5Y5/6), saturated, medium stiff, medium plasticity, no product odor.
23			22		
		0.0	24	SC	Clayey sand (SC): light olive brown (2.5Y5/6), saturated, soft, medium plasticity, no product odor, 40% clay.
	80%		26		
		0.9		CL	Silty Clay (CL): yellowish brown (10YR5/4), saturated, very stiff, low plasticity, no product odor.
28			28		
			30		

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
RENO-DENVER-MILWAUKEE-IRVINE

DRILLING LOG

WELL NUMBER SB-8 (MW-7) Page 1 of 1

Project Livermore-Dublin Disposal Owner WMNA

Location Livermore, Ca. Project Number 409E39011

Date Drilled 10/6/90 Total Depth of Hole 30.0' Diameter 10"

Surface El. 537.09 Water Level Initial _____ 24 hrs. _____

Screen: Dia. 4" Length 25' Slot Size _____

Casing: Dia. 4" Length 3.5' Type PVC Sch. 40

Drilling Company West Hazmat Drilling Corp. Drilling Method Hollow Stem Auger -Continuous Core

Driller Mark Thorp Log by R.J.Johnson

Sketch Map

Notes

Sample Depth (ft.)	Recovery	H-NU	Depth (ft)	Log	DESCRIPTION
			0	Fill	Surface Asphalt
0					Baserock
	25%		2	CL	Silty clay (CL): light olive brown (2.5Y5/6), slightly moist, loose, no product odor, 20% fine-grained sand.
3		5.2	4		
	20%		6	CL	Sandy clay (CL): light olive brown (2.5Y5/4),moist, soft, low plasticity, no product odor, 40% fine-grained sand
8			8	CL	Silty clay (CL): light olive gray (5Y6/2), saturated, soft, low plasticity, strong product odor.
	55%	8.2	10		
			12	CL	Sandy clay (CL): light yellowish brown (2.5Y6/4), saturated, very stiff, low plasticity, no product odor 30% fine-grained sand.
13		11.2	14	CL	Silty clay (CL): light yellowish brown (2.5Y6/4), saturated, soft, nonplastic, moderate product odor.
	80%		16	CL	Sandy clay (CL): light olive brown (2.5Y5/6), saturated, medium stiff, medium plasticity, no product odor, 30% fine-grained sand.
18			18		
	100%	0.4	20	CL	Silty clay (CL): light olive brown (2.5Y5/4), saturated, soft, medium plasticity, no product odor.
23			22	SC	Clayey sand (SC): light olive brown (2.5Y5/6), saturated, soft, low plasticity, no product odor, 70% fine-grained sand, 30% clay.
	100%	0.0	24	SP	Sand (SP): light olive brown (2.5Y5/4), saturated, loose, no product odor, 90% fine-grained sand, 10% silt.
28			26	CL	Sandy clay (CL): light olive brown (2.5Y5/4), saturated, medium stiff, medium plasticity, no product odor, 30% fine-grained sand.
		0.0	28	SC	Clayey sand (SC): light olive brown (2.5Y5/6), saturated, medium plasticity, nonplastic, no product odor, 80% fine-grained sand, 20% clay.
			30		

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
RENO-DENVER-MILWAUKEE-IRVINE

DRILLING LOG

WELL NUMBER SB-1 Page 1 of 1

Project Livermore-Dublin Disposal Owner WMNA

Location Livermore, Ca. Project Number 409E39011

Date Drilled 10/4/90 Total Depth of Hole 13' Diameter 8"

Surface El. _____ Water Level Initial _____ 24 hrs. _____

Screen: Dia. _____ Length _____ Slot Size _____

Casing: Dia. _____ Length _____ Type _____

Drilling Company West Hazmat Drilling Corp. Drilling Method Hollow Stem Auger -Continuous Core

Driller Mark Thorp Log by R.J.Johnson

Sketch Map

Notes

Sample Depth (ft.)	Recovery	H-NU		Depth (ft)	Log	DESCRIPTION
0				0		Surface Asphalt
					Fill	Baserock
	10%			2		Gravelly sand (SW): Very dark gray (5YR3/1), slightly moist, loose, no product odor, 55% fine-to coarse-grained sand, 30% subangular gravel up to 30mm, 15% clay.
3						
	10%			4		
				6		
8		2.2		8		Clayey sand (SC): Very dark gray (5YR3/1), slightly moist, medium stiff, low plasticity, no product odor, 70% fine-grained sand, 30% clay, a few subangular gravels up to 20mm.
	20%			10		
				12		
13		70%				Total Depth = 13 feet; recovery minimal; continuous core system malfunctioned; unable to determine depths where changes in soil types occurred.
				14		
				16		

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
RENO-DENVER-MILWAUKEE-IRVINE

DRILLING LOG

WELL NUMBER SB-5 Page 1 of 1

Project Livermore-Dublin Disposal Owner WMNA

Location Livermore, Ca Project Number 409F39011

Date Drilled 10/5/90 Total Depth of Hole 28.0' Diameter 8"

Surface El. _____ Water Level Initial _____ 24 hrs. _____

Screen: Dia. _____ Length _____ Slot Size _____

Casing: Dia. _____ Length _____ Type _____

Drilling Company West Hazmat Drilling Corp. Drilling Method Hollow Stem Auger -Continuous Core

Driller Mark Thorp Log by R.J.Johnson

Sketch Map

Notes

Sample Depth (ft.)	Recovery	H-NU	Depth (ft)	Log	DESCRIPTION
0			0		Surface Asphalt
	30%		2	GW	Sandy gravel (GW): dark brown (10YR4/3), slightly moist, loose, no product odor, 50% subrounded gravels up to 15mm, 50% fine-to coarse-grained sand.
3			4		
	50%	0.0	6	CL	Silty clay (CL): light olive brown (2.5Y5/6), slightly moist, loose no product odor.
8			8		
	40%	0.1	10		
13			12	CL	Sandy clay (CL): grayish brown (2.5Y5/2), moist, medium stiff, medium plasticity, no product odor, 30% fine-grained sand.
	60%	0.0	14		
			16	SC	Clayey sand (SC): grayish brown (2.5Y5/2), saturated, soft, low plasticity, no product odor, 80% fine-grained sand, 20% clay.
18			18		
	100%	0.0	20	SP	Sand (SP): light olive brown (2.5Y5/6), saturated, loose, no product odor, 90% fine-to medium-grained sand, 10% silt.
23			22	CL	Sandy clay (CL): light olive brown (2.5Y5/4), saturated, stiff, medium plasticity, no product odor, 30% fine-grained sand.
	100%	0.0	24	SP	Sand (SP): same as at 18 to 21.5'.
			26	CL	Sandy clay (CL): light olive brown (2.5Y5/6), saturated, medium stiff, medium plasticity,, no product odor, 40% fine-grained sand.
28		0.0	28	CL	Silty clay (CL): light olive brown (2.5Y5/6), saturated, very stiff, medium plasticity, no product odor.
			30		

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
RENO-DENVER-MILWAUKEE-IRVINE

DRILLING LOG

WELL NUMBER SB-6 Page 1 of 1

Project Livermore-Dublin Disposal Owner WMNA

Location Livermore, Ca. Project Number 409E39011

Date Drilled 10/5/90 Total Depth of Hole 28.0' Diameter 8"

Surface El. _____ Water Level Initial _____ 24 hrs. _____

Screen: Dia. _____ Length _____ Slot Size _____

Casing: Dia. _____ Length _____ Type _____

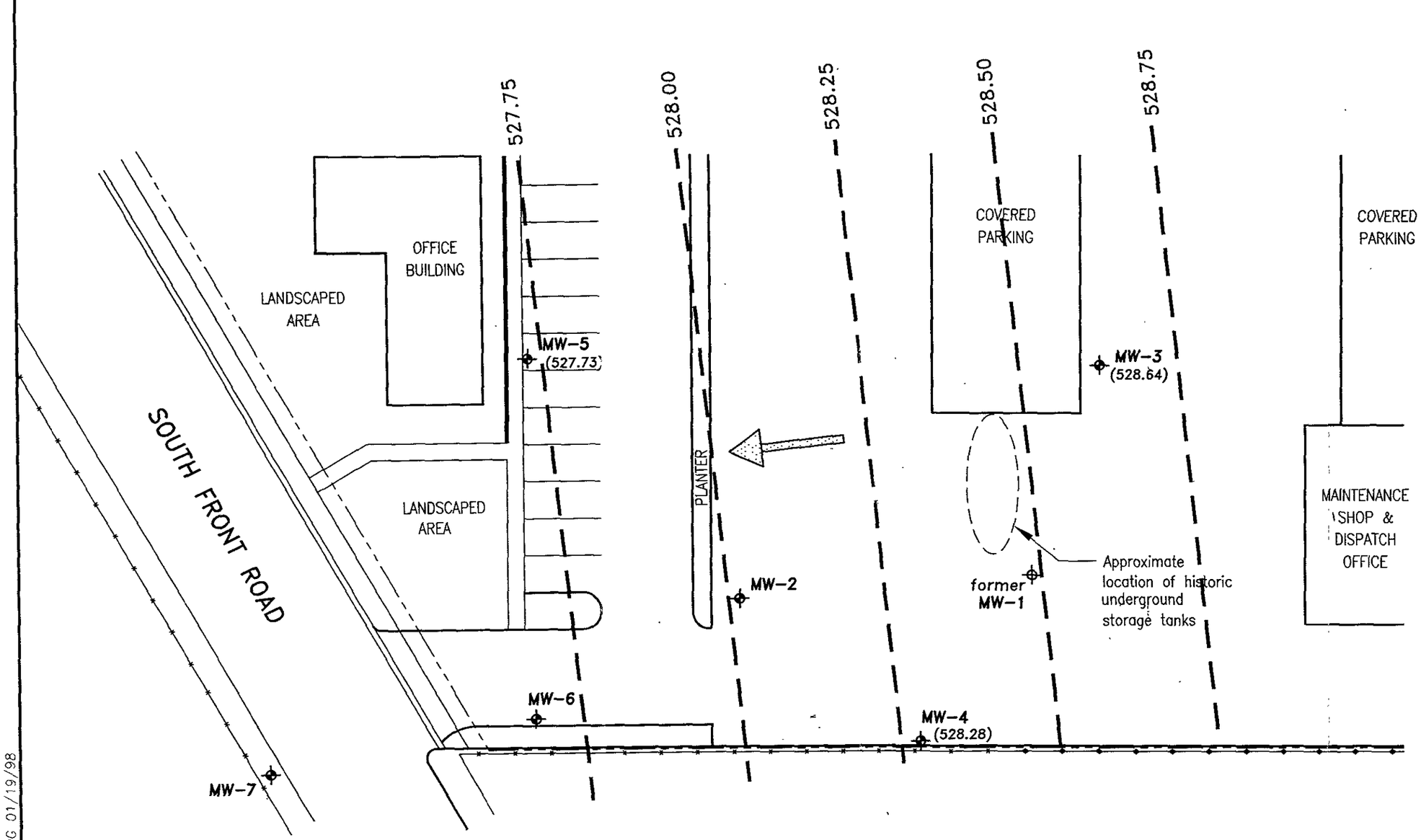
Drilling Company West Hazmat Drilling Corp. Drilling Method Hollow Stem Auger -Continuous Core

Driller Mark Thorp Log by R.J.Johnson

Sketch Map

Notes

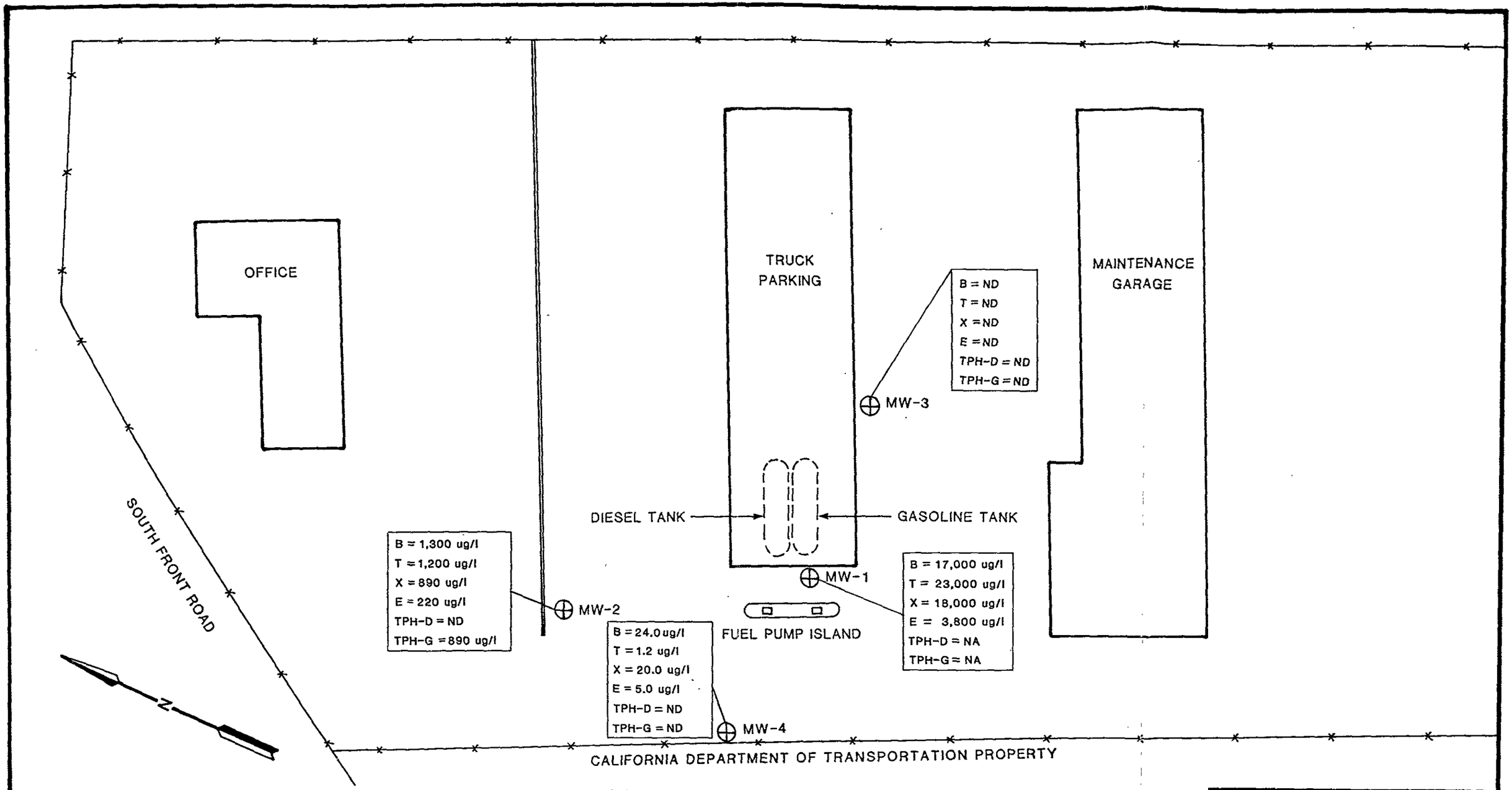
Sample Depth (ft.)	Recovery	H-NU	Depth (ft)	Log	DESCRIPTION
			0		Surface Asphalt
0					
	20%		2	SP	Sand (SP): yellowish brown (10YR5/6), slightly moist, loose, no product odor, 90% fine-grained sand, 10% silt.
3		0.0	4		
	40%		6	CL	Sandy clay (CL): light olive brown (2.5Y5/4), slightly moist, very stiff, medium plasiticity, no product odor, 30% fine-grained sand.
8			8	CL	Silty clay (CL): light olive brown (2.5Y5/4), slightly moist, medium stiff, medium plasticity, no product odor.
	45%	0.0	10		
			12	CL	Sandy clay (CL): light olive brown, (2.5Y5/4), slightly moist, medium stiff, medium plasticity, no product odor, 30% fine-grained sand.
13			14	▼	
	95%	0.0	16		
18			18		
	100%	0.0	20	SP	Sand (SP): light olive brown (2.5Y5/6), saturated, very stiff, loose, no product odor, 90% fine-grained sand, 10% clay.
			22		
23			24		Sandy clay (CL): light olive brown (2.5Y5/6), saturated, very stiff, low plasticity, no product odor, 30% fine-grained sand.
	45%	0.0	26	CL	
28			28		
			30		



L:\CAD\PROJECTS\200334\FIG2.DWG 01/19/98

RUST
Rust Environment & Infrastructure Inc.

FIGURE 2.11
GROUNDWATER ELEVATION MAP
LIVERMORE–DUBLIN DISPOSAL FACILITY
LIVERMORE, CALIFORNIA
JANUARY 1998 200334.10100



EXPLANATION

⊕ MW-1	Existing monitor well	TPH-D	Total Petroleum Hydrocarbons-Diesel, reporting limit = 100 ug/l
B	Benzene, reporting limit = 0.3 ug/l	TPH-G	Total Hydrocarbons-Gasoline, reporting limit = 500 ug/l
T	Toluene, reporting limit = 0.3 ug/l	ND	Not detected
X	Total Xylenes, reporting limit = 0.6 ug/l	NA	Not analyzed
E	Ethylbenzene, reporting limit = 0.3 ug/l		

SCALE

0 30 60 ft.

NOTE: Wells MW-2, 3 and 4 sampled 9-15-89
Well MW-1 sampled 12-10-88

HYDROCARBON CONCENTRATIONS
IN GROUND-WATER
LIVERMORE-DUBLIN DISPOSAL
LIVERMORE, CALIFORNIA

PROJECT	109E29011	REVISIONS
DATE	OCT. 1989	

Hydro-Search, Inc.
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
MILWAUKEE • DENVER • RENO • IRVINE

FIGURE 4