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**GROUND WATER MONITORING REPORT
DECEMBER 1993
CLARK'S HOME AND GARDEN
23040 CLAWITER ROAD
HAYWARD, CALIFORNIA

PROJECT 4983**

for

Mr. Chester Clark
521 Triller Lane
Grants Pass, Oregon 97527

by

TERRATECH, INC.
1365 Vander Way
San Jose, California 95112



**GROUND WATER MONITORING REPORT
DECEMBER 1993
CLARK'S HOME & GARDEN
23040 CLAWITER ROAD, HAYWARD**

INTRODUCTION

This report describes the work performed for and the findings from Terratech's recent testing of the shallow ground water at Clark's Home & Garden Center, 23040 Clawiter Road in Hayward (see Figures 1 and 2). The work is being performed according to requirements of the Alameda County Health Agency (ACHA) for follow-up to a fuel leak discovered when two underground storage tanks were removed from the site in 1988.

Background information on this project is presented in Terratech's Project 4983 reports, "Initial Investigation of Ground Water Contamination, ...," dated September 5, 1991; "Follow-up Ground Water Testing, ...," dated November 12, 1991; and three subsequent Quarterly Ground Water Sampling and Analysis reports, dated February 26, 1992, May 6, 1992 and July 7, 1992.

WORK PERFORMED

On November 23, 1993 members of Terratech's environmental department performed the quarterly sampling of on-site monitoring well MW-1. The depth to standing water in the well was first measured to the nearest 0.01-foot using an electronic probe. The well was then purged using a pre-cleaned Teflon bailer. During purging, temperature, pH and specific conductance measurements were recorded until stable (< 10% variation) readings were obtained. Approximately four well-volumes of water were removed from MW-1 prior to collecting a sample. The sampling technicians logged field notes on a Well Sampling Data Sheet (see copy in appendix). Purged water was placed into a labeled drum and left on site.

After purging, ground water from MW-1 was carefully transferred from the bailer into a set of three 40-ml volatile organic analysis (VOA) vials, and a pair of 1-liter amber jars supplied by the testing laboratory. The VOA vials, which contained a small amount of hydrochloric acid preservative, were filled until a positive meniscus formed then sealed with a Teflon septum screw cap. The containers were inverted and tapped to confirm the absence of headspace or bubbles, then immediately labeled and iced. The amber jars were filled, capped labeled and iced.

The sample containers were kept iced or refrigerated from the time of collection until the time of analysis. Sample collection, handling and analytical requests were documented on a chain-of-custody record (appended).

The ground water sample was transferred to and analyzed by AN/EN, Inc., a State-certified laboratory in Marina, California for total petroleum hydrocarbons (TPH) as diesel using EPA Method 3510 extraction and GC-FID detection; TPH as gasoline using EPA Method 5030 with GC-FID detection; and the specific fuel compounds - benzene, toluene, ethylbenzene and xylenes (BTEX) using a modified EPA Method 8020.



FINDINGS AND COMMENTS

Table 1 presents a summary of ground water level measurements in MW-1 to-date. The on-site ground water level was approximately 0.39 feet higher than the July 7, 1992 sampling event. Based on previously reviewed information on surrounding fuel leak sites, the local ground water gradient direction is expected to be generally toward the west.

A prominent fuel odor and surface sheen on purged water were noticed by our sampling technicians during the November sampling activities. Recent laboratory analyses of the MW-1 ground water sample detected significantly lower concentrations of TPH and BTEX. Only benzene, by a small margin, exceeds stringent state drinking water standards. It still appears that the ground water impact is from a mixture of gasoline and diesel, and possibly other petroleum fuel(s).

Ground water sample analyses results to date are summarized in Table 2. The November 1993 laboratory report is appended.

LIMITATIONS

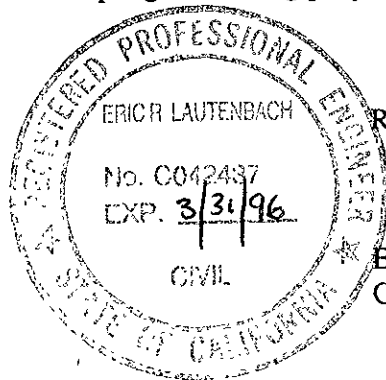
This report and the associated work have been provided in accordance with the general principles and practices currently employed in the environmental consulting profession. This is in lieu of all warranties, express or implied. Our sampling and testing program is necessarily limited.

Report Prepared by:

TERRATECH, INC.

Diane Phillips

Diane Phillips
Staff Environmental Geologist



Reviewed by:

E. R. Lautenbach

Eric R. Lautenbach
CE 42437

- cc: Juliette Chen - Alameda County Health Agency
- Eddy So - California Regional Water Quality Control Board
- Hugh Murphy - Hayward Fire Department
- Butch Voss - L.H. Voss Materials, Inc.
- Bob Price



| TABLE 1 SUMMARY OF GROUND WATER DEPTH MEASUREMENTS Clark's Home and Garden Center 23040 Clawiter Road Hayward, California | |
|--|------------------------------|
| Location and Date | Depth to Ground Water (feet) |
| MW-1 | |
| 08/07/91 | 17.44 |
| 09/05/91 | 17.72 |
| 10/15/91 | 17.92 |
| 01/07/92 | 17.23 |
| 04/08/92 | 15.57 |
| 07/07/92 | 16.67 |
| 11/23/93 | 16.28 |



| <p align="center">TABLE 2</p> <p align="center">SUMMARY OF GROUND WATER SAMPLE ANALYSIS RESULTS</p> <p align="center">Clark's Home and Garden Center 23040 Clawiter Road Hayward, California</p> <p align="center">(Concentrations are in parts per billion (ppb))</p> | | | | | | |
|---|---------------|-----------------|---------|---------|---------------|---------|
| Sample Location and Date | TPH as Diesel | TPH as Gasoline | Benzene | Toluene | Ethyl-benzene | Xylenes |
| MW-1 | | | | | | |
| 08/07/91 | 7,100 | 5,900 | 45 | <25 | 130 | 520 |
| 09/05/91 | 2,800* | 47,000 | <50 | <50 | 230 | 660 |
| 10/15/91 | 13,000 | 24,000 | <50 | <50 | <50 | 390 |
| 01/07/92 | 9,000* | 23,000** | <50 | <50 | 270 | 800 |
| 04/08/92 | 3,500* | 8,100 | 19 | <5 | 350 | 210 |
| 07/07/92 | 6,300 | 7,000 | <5 | <5 | 190 | 170 |
| 11/23/93 | 1,600 | 2,400 | 1.5 | 3.7 | 41 | 24 |
| Action Level/MCL | -- | -- | 1 | 100 | 680 | 1,750 |

NOTES:

TPH = Total petroleum hydrocarbons

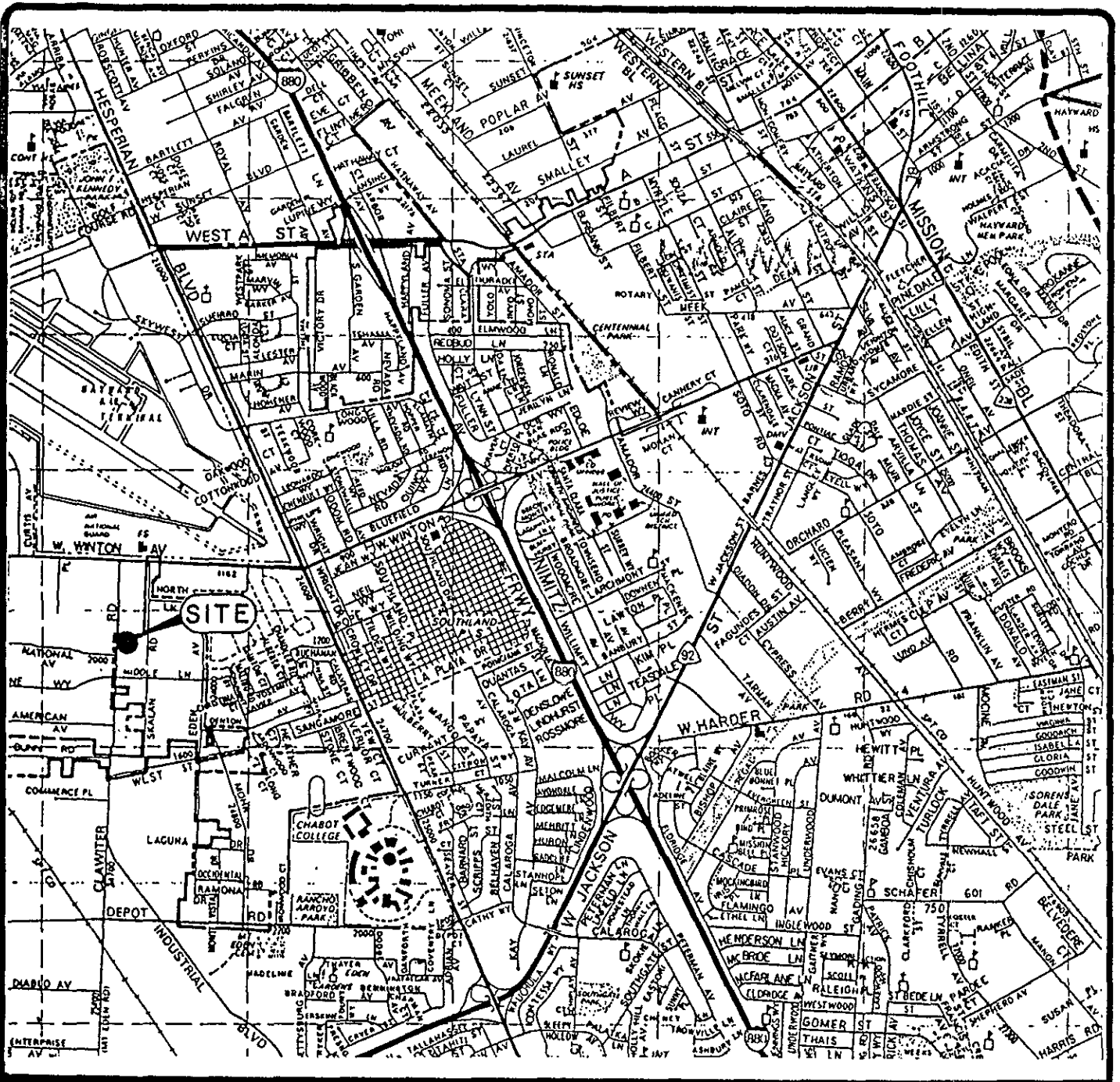
*Laboratory notes that petroleum hydrocarbon detected as diesel is due to both diesel and a petroleum hydrocarbon lighter than diesel.

**Laboratoy notes that petroleum hydrocarbon detected as gasoline does not appear to have a typical gasoline pattern.

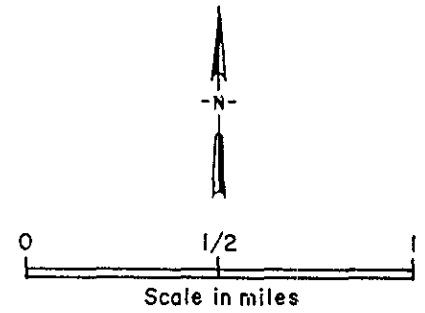
Action Levels and Maximum Contaminant Levels (MCL) are for contaminants in drinking water, as established by the Environmental Protection Agency.

-- = Action Level or MCL not established for TPH in drinking water. Clean-up guidelines are established on a site-specific basis.





BASE MAP: Thomas Brothers Maps; Alameda County
1990 edition; p. 58.

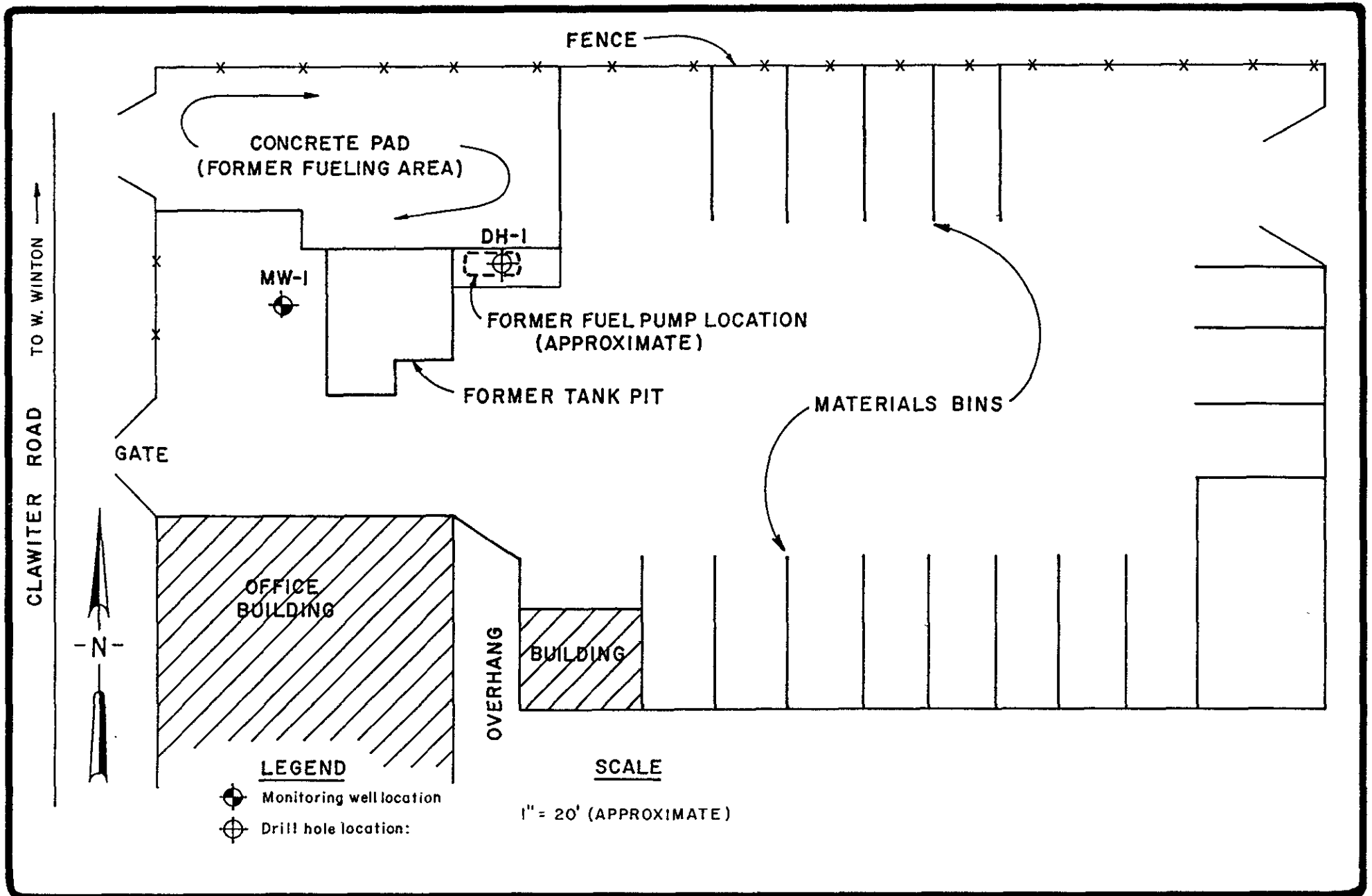



AUG. 1991
TERRATECH

CLARK'S HOME AND GARDEN
23040 CLAWITER ROAD
HAYWARD, CALIFORNIA

SITE VICINITY MAP

FIGURE
1
PROJECT
4983




AUG. 1991
TERRATECH

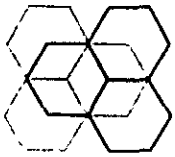
CLARK'S HOME AND GARDEN
 23040 CLAWITER ROAD
 HAYWARD, CALIFORNIA

SITE PLAN

FIGURE
 2
PROJECT
 4983

APPENDIX

**Well Sampling Data Sheet
Chain-of-Custody Record
and
Analytical Report**



AN/EN Inc

Analysis Report on Chemistry

12/02/93

A/E2028

ERIC LAUTENBACH
TERRATECH, INC.
1365 VANDER WAY
SAN JOSE, CA 95112

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

Client Project ID: 4983
Date Received by Lab: 11/24/93
Total Number of Samples: 1
Sample Matrix: WATER


BTEX is analyzed in accordance with EPA Test Methods for Evaluating Solid Waste, (SW846), Third edition, November 1986. Method 5030 (Purge and Trap) is used for the sample preparation/introduction. Method 8020 (Aromatic Volatile Organics) is used for the analysis.

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

Total Semi & Non-volatile Petroleum Hydrocarbons as Diesel is analyzed in accordance with the California State Water Resources Control Board Leaking Underground Fuel Tank (LUFT) Field Manual, Last Revision October 1989.

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

Reviewed and Approved


Laurie Glantz-Murphy
Laboratory Manager



AN/EN Inc

Analytical & Environmental Chemistry

Laboratory Number: A/E2028

Project: 4983

Sample Matrix: WATER

Date Received: 11/24/93

Sample Received: 40mL VOA bottles; <4°C; HCl preserved; No headspace.
1L amber glass; <4°C; HCl preserved.

Date of Volatile Analysis: 11/26/93

Date of Semi & Non-volatile Analysis: 11/30/93

Concentration in Sample expressed as ug/L (ppb)

| Analyte | MW-1 | PQL |
|-----------------------|--------|------|
| Benzene | 1.5 | 0.50 |
| Toluene | 3.7 | 0.50 |
| Ethylbenzene | 41. | 0.50 |
| Xylenes ¹ | 24. | 0.50 |
| Gasoline ² | 2,400. | 50. |
| Diesel ³ | 1,600. | 50. |

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

2 Total Volatile Petroleum Hydrocarbons as Gasoline.

3 Total Semi and Non-Volatile Hydrocarbons as Diesel.

PQL = Practical Quantitation Limit (pp).

ND = None Detected at or above the PQL.

| WATER MS/MSD | MS %REC | MSD %REC | RPD | % REC 3s | RPD 3s | SAMPLE ID |
|--------------|---------|----------|-----|----------|--------|------------|
| Benzene | 99 | 100 | 1.0 | 55 - 133 | 20. | A/E2004-02 |
| Toluene | 99 | 100 | 1.0 | 56 - 122 | 21. | |
| Ethylbenzene | 102 | 105 | 2.9 | 56 - 122 | 21. | |
| Xylenes | 98 | 102 | 4.0 | 54 - 123 | 25. | |
| Diesel | 103 | 125 | 19. | 38 - 128 | 36. | A/E1977-03 |



1365 VANDER WAY
 SAN JOSE, CA 95112
 (408) 297-6969

TERRATECH

CHAIN-OF-CUSTODY RECORD

P.O. NUMBER: 3471

TURNAROUND: Standard

| FAX reports upon completion to: (408) 297-7716 Mail reports to: TERRATECH, INC. 1365 VANDER WAY, SAN JOSE, CA 95112 ATTN: ERIC LAUTENBACH | | | | | | Number of Containers | Type of Containers | Preserved? | Analysis Required | | | | | Remarks |
|--|-------|------------------------|-------|--|-----------------|------------------------------|--------------------|------------|-------------------|---|---------------|--|--|----------|
| Sample Number | Depth | Date | Time | Medium | Sample Location | | | | TPH as Gasoline | BTEX | TPH as Diesel | | | |
| PROJECT NUMBER: 4983 | | | | | | | | | | | | | | |
| SAMPLER INITIALS: DP/BDF | | | | | | | | | | | | | | |
| NW-1 | ~20' | 11/23/93 | 14:04 | Water | MW-1 | 3 | 40 ml VOAS | yes | X | X | | | | A/E 2028 |
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 2 | 1 liter Ambers | NO | | X | | | | DM ↓ |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
| Relinquished by (signature): <i>Diane Phillips</i> | | Date/Time: 11/24/93 | | Received by (signature): <i>Eric Lautenbach</i> | | Relinquished by (signature): | | Date/Time: | | Received by (signature): | | | | |
| Company or Agency: TERRATECH, INC | | 1415 | | Company or Agency: HOLLER | | Company or Agency: | | | | Company or Agency: | | | | |
| Relinquished by (signature): | | Date/Time: | | Received by (signature): | | Relinquished by (signature): | | Date/Time: | | Received for Laboratory by (signature): | | | | |
| Company or Agency: | | | | Company or Agency: | | Company or Agency: | | | | Company or Agency: | | | | |

TERRATECH, INC.
WELL SAMPLING DATA SHEET

PROJECT NAME: Clark Fuel Leak
PROJECT NUMBER: 4983
WELL DESIGNATION: MW-1

DATE: 11/23/93
SAMPLER: DP/BDF
SAMPLE NUMBER: MW-1

CONDITION OF WELL HEAD/VAULT:

TOP OF CASING ELEVATION:
DEPTH TO GROUND WATER (initial): 16.28
DEPTH TO BOTTOM OF WELL: MEASURED 23.6' EXPECTED 23.6'
HEIGHT OF WATER COLUMN (HWC): 7.32

CASING DIAMETER: 2" X 3" _____ 4" _____ OTHER _____

CALCULATED WELL VOLUME: HWC x V = _____
Volume (V) of 2" well - 0.163 gal/ft $7.32 \times .163 = 1.2$
Volume (V) of 4" well - 0.653 gal/ft

ODOR Strong SHEEN V. Slight FLOATING PRODUCT THICKNESS None

PUMP TYPE: PVC HAND _____ BLADDER _____ PNEUMATIC _____
ELECTRIC _____ BAILER X OTHER _____

PUMP DEPTH:

| TIME | GALLONS PURGED | NO. OF WELL VOLUMES | pH | TEMPERATURE (°F or °C) | CONDUCTIVITY (mmhos/cm or µmhos/cm) | TURBIDITY (NTU or visual) |
|------|----------------|---------------------|------|------------------------|-------------------------------------|---------------------------|
| 1350 | 1.2 | 1 | 6.65 | 161.5 °F | 2740 | Slight |
| | 2.4 | 2 | 8.05 | 64.1 °F | 2750 | Very Slight |
| | 3.6 | 3 | 7.62 | 63.5 °F | 2850 | V. Slight |
| 1400 | 4.8 | 4 | 7.56 | 63.4 °F | 2840 | V. Slight |
| | | | | | | |
| | | | | | | |

RECHARGE RATE (qualitative): Good

DEPTH TO WATER (pre-sample collection): 16.3

SAMPLER TYPE: TEFLON BAILER X ACRYLIC BAILER _____ ELECTRIC _____
TEFLON BLADDER _____ PNEUMATIC PUMP _____ OTHER _____

SAMPLES COLLECTED: PRESERVED VOA'S 3 UNPRESERVED VOA'S _____
PRESERVED LITERS _____ UNPRESERVED LITERS 2
500 ml PLASTIC BOTTLE WITH PRESERVATIVE FOR METALS:
FILTERED _____ UNFILTERED _____
OTHER _____

COMMENTS: