THE REYNOLDS GROUP
ENVIRONMENTAL SERVICES



# GROUNDWATER MONITORING REPORT

## MALIBU PARK SCHOOL
## 30215 MORNING VIEW DRIVE
## MALIBU, CALIFORNIA

**APRIL, 1996**



**FOR SUBMITTAL TO:**

**California Regional Water Quality Control Board**
**Leaking Underground Tank Division**
**101 Centre Plaza Drive**
**Monterey Park, CA 91754-2156**
**LOP File No. I-13216**

**ON BEHALF OF:**

**Santa Monica-Malibu School District**
**1651 Sixteenth Street**
**Santa Monica, California 90404**

**TRG Project Number 4786-SMMS**

250 El Camino Real, Suite 214, Tustin, California 92680
Phone 714 730 5288 Fax 714 730 6476

# TABLE OF CONTENTS

## GROUNDWATER MONITORING REPORT

## MALIBU PARK SCHOOL
## 30215 MORNING VIEW DRIVE
## MALIBU, CALIFORNIA

## TABLES



## FIGURES



## APPENDICES

# GROUNDWATER MONITORING REPORT

## MALIBU PARK SCHOOL
## 30215 MORNING VIEW DRIVE
## MALIBU, CALIFORNIA

## 1.0 INTRODUCTION AND DESCRIPTION OF WORK PERFORMED

This report presents the results of the groundwater monitoring conducted at Malibu Park School located at 30215 Morning View Drive in Malibu, California (Figure 1) on April 4, 1996. The Reynolds Group (TRG) was retained by Vector Three Environmental, Inc., to perform the work. Figure 2 shows the location of the wells.

A PVC bailer was used for well purging and a teflon bailer was used for sample collection. Purged water was stored in labeled 55-gallon DOT-approved barrels and stored on-site pending laboratory analysis. Field notes are attached in Appendix B.

Concentrations of benzene, toluene, ethylbenzene, and total xylenes were detected in monitoring wells MW3 and MW4. Samples collected from monitoring wells MW1 and MW2 as well as the equipment blank were "non-detect" for all constituents analyzed.

## 2.0 MONITORING/SAMPLING RESULTS

### 2.1 Groundwater Gradient

Prior to purging and sampling, the depth-to-water in each well was measured using an electronic sounder. The groundwater flow direction and slope were then calculated by determining the elevations of groundwater in each well relative to surveyed top-of-casing elevations. These data are summarized in Table 1 below. The groundwater flow direction and gradient were calculated to be approximately towards the south-southeast at a rate of 0.037 feet per foot. The groundwater flow direction with gradient contours is shown in Figure 3.

**TABLE 1**
**SUMMARY OF GROUNDWATER ELEVATION DATA**

| WELL | DATE | ELEVATION OF TOP OF CASING* | DEPTH TO GROUNDWATER | ELEVATION OF GROUNDWATER SURFACE |
|---|---|---|---|---|
| MW1 | 5/5/95 | 98.83 | 27.69 | 71.14 |
| | 1/16/96 | | 31.85 | 66.98 |
| | 4/4/96 | | 31.58 | 67.25 |
| MW2 | 5/5/95 | 99.72 | 28.78 | 70.94 |
| | 1/16/96 | | 32.92 | 66.80 |
| | 4/4/96 | | 32.66 | 67.06 |
| MW3 | 5/5/95 | 98.55 | 29.22 | 69.33 |
| | 1/16/96 | | 32.83 | 65.72 |
| | 4/4/96 | | 32.53 | 66.02 |
| MW4 | 5/5/95 | 99.29 | 30.22 | 69.07 |
| | 1/16/96 | | 34.23 | 65.06 |
| | 4/4/96 | | 34.65 | 64.64 |

* Elevations are relative to a benchmark of 100.00 feet previously established by Eagle Eye Mapping.

## 2.2 SAMPLING PROCEDURES

Two PVC bailer were used for purging the four wells. Approximately three casing volumes of water were purged from each well. During purging, the electrical conductivity pH, and temperature of the well water was measured with a Hydac Conductivity, pH, and Temperature Meter to determine when equalization (confirmation that pH and conductivity values of purged water are consistent within 5%) was achieved. A Lamot Turbidity Meter was used to measure the turbidity during purging. The field notes are included in Appendix B. Purged water was stored in labeled 55-gallon DOT-approved barrels and stored on-site.

Once equalization was achieved or three casing volumes had been removed, the well was allowed to recharge. Groundwater samples were then collected from the surface of the aquifer using a teflon sampler. The sampler was slowly lowered into the monitoring well, to reduce agitation of the groundwater. Upon removal from the well, water from the filled sampler was extracted to containers using a bottom-emptying device.

Each water sample was emptied into two pre-cleaned 40 milliliter (mL) VOA sample vials and a one liter glass amber jar. The sample containers were first rinsed with well water, and then overfilled to avoid headspace. One additional vial was filled for turbidity analysis.

The sample turbidity was measured and recorded on the field notes. The filled sample containers were labeled, placed in an ice-cooled chest, and transported to Chemical and Environmental Laboratories, a California Department of Health Services certified laboratory #1597, following chain-of-custody procedures. One "equipment blank" sample, was collected by pouring deionized water through the teflon sampler into a 40 mL VOA vial to insure that cross contamination of groundwater samples was not occurring due to improper decontamination of the sampling equipment.

## 2.3 Analytical Results

The samples were analyzed for total petroleum hydrocarbons (TPH) according to Method 8015 modified for diesel and for benzene, toluene, ethylbenzene and xylenes (BTEX) according to EPA Method 8020. Samples were analyzed by Chemical and Environmental Laboratories, Inc. of Santa Fe Springs, California, a State-certified hazardous waste laboratory #1597. Results from the current and previous monitoring rounds are summarized in Table 2 below. The laboratory report and chain-of-custody documentation are included in Appendix C.

Detectable concentrations of benzene, toluene, ethylbenzene, and total xylenes were identified in samples collected from monitoring wells MW3 and MW4. No TPH as diesel was detected in any monitoring well during this groundwater monitoring round. No free product was observed during the field work.

**TABLE 2**
**SUMMARY OF LABORATORY ANALYSIS RESULTS**
**(RESULTS IN PPB[1])**

| WELL | SAMPLING DATE | TPH AS DIESEL[2] | BENZENE[3] | TOLUENE[3] | ETHYL BENZENE[3] | XYLENE[3] |
|---|---|---|---|---|---|---|
| MW1 | 5/3/95 | ND | ND | ND | ND | ND |
| | 1/16/96 | ND | ND | ND | ND | ND |
| | 4/4/96 | ND | ND | ND | ND | ND |
| MW2 | 5/3/95 | ND | ND | ND | ND | ND |
| | 1/16/96 | ND | ND | ND | ND | ND |
| | 4/4/96 | ND | ND | ND | ND | ND |
| MW3 | 5/3/95 | 1,200 | 42.9 | 16.3 | 6.9 | 41.5 |
| | 1/16/96 | ND | 57.3 | ND | 80.1 | 1.6 |
| | 4/4/96 | ND | 21.3 | 1.3 | 31.3 | 2.3 |
| MW4 | 5/3/95 | 800 | 3.4 | 2.5 | 3.8 | 16.5 |
| | 1/16/96 | ND | 128.7 | ND | 69.5 | ND |
| | 4/4/96 | ND | 119.7 | 1.5 | 9.6 | 1.9 |
| Detection Limit | | 500 | 0.3 | 0.3 | 0.3 | 0.5 |

1) PPB = parts per billion or micrograms per liter.
2) TPH as diesel according to EPA Method 8015 modified for diesel.
3) Benzene, toluene, ethylbenzene, and xylenes (BTEX) analyzed according to EPA Method 8020.
4) ND = compound not detected above specified detection unit.
5) Blank sample was "non-detect" for all constituents.

## 3.0 CONCLUSIONS

Based on data gathered, we have drawn the following conclusions:

- The groundwater flow direction was found to be towards the south-southeast, which is consistent with previous findings;

- Low concentrations of dissolved benzene, toluene, ethylbenzene and xylenes were detected in downgradient wells MW3 and MW4, which are consistent with previous results.

## 4.0 LIMITATIONS

This report is based on the information gathered during the course of the work as described in the text. Its validity is based on the available facts, circumstances, and data as of the date of the report and TRG takes no responsibility for any subsequent changes in those facts, circumstances, and data.

If you have any questions regarding the contents of this report, please call Ed Reynolds or Angel Cardoza directly at (714) 730-5397.

Thank you for this opportunity to work for you.

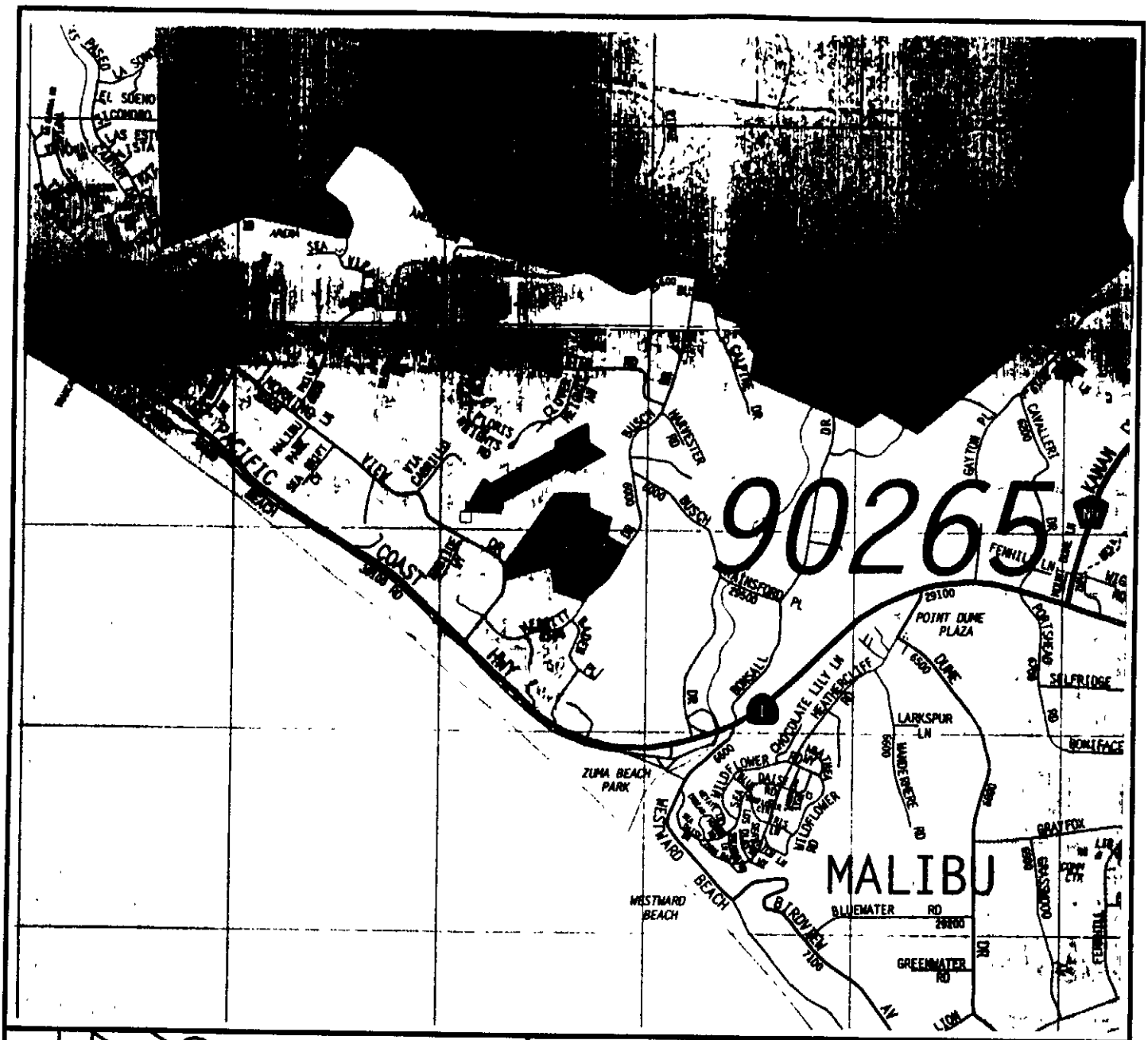
Prepared by:
**THE REYNOLDS GROUP**
**A California Corporation by:**

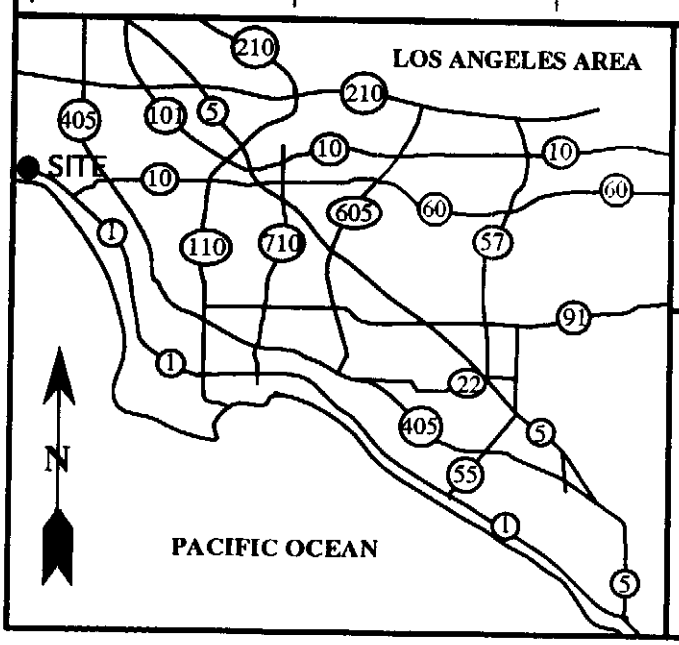
F. Edward Reynolds, Jr., P.E.
California RCE #38677

Angel Cardoza, Jr.
Environmental Engineer

# FIGURE 1

# SITE LOCATION MAP




ADAPTED FROM 1993 LA/ORANGE COUNTY THOMAS BROTHERS GUIDE, PAGES 627 & 667.

0 2000 4000

FEET

APPROXIMATE SCALE

THE REYNOLDS GROUP

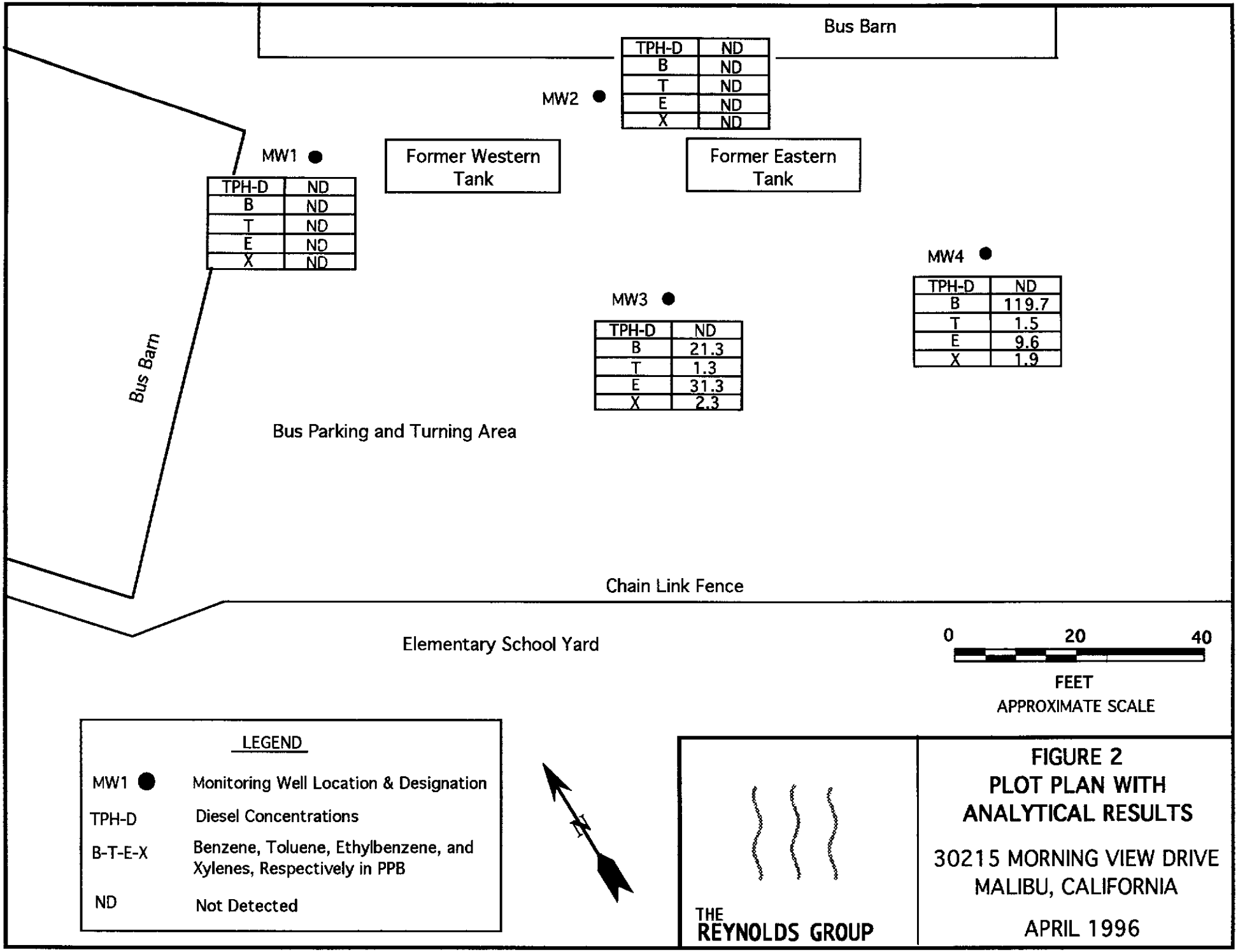
# FIGURE 1
# SITE LOCATION MAP

30215 MORNING VIEW DRIVE
MALIBU, CALIFORNIA

APRIL 1996

# FIGURE 2

# PLOT PLAN WITH ANALYTICAL RESULTS



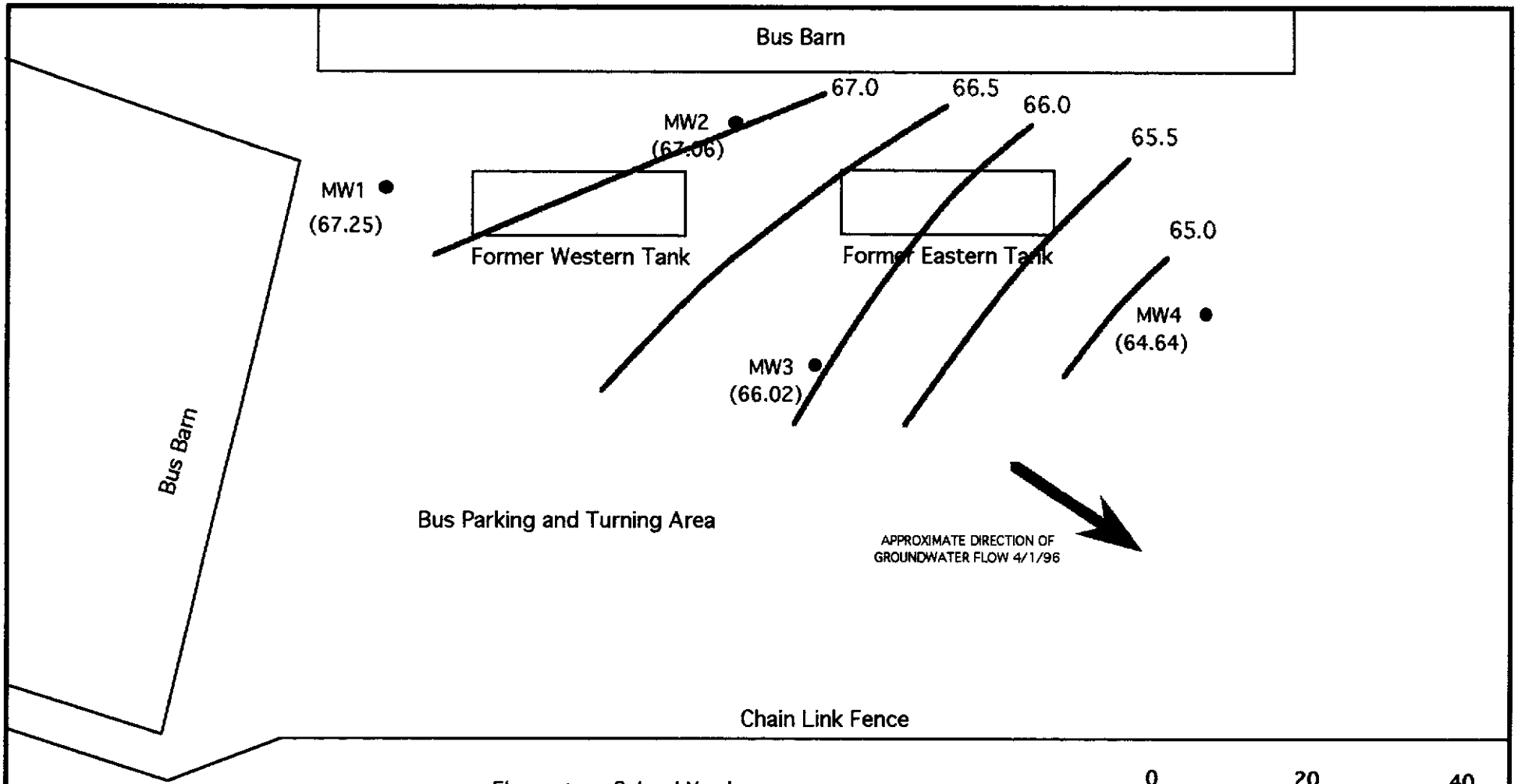

# FIGURE 2
# PLOT PLAN WITH ANALYTICAL RESULTS

30215 MORNING VIEW DRIVE
MALIBU, CALIFORNIA

APRIL 1996

# FIGURE 3

# PLOT PLAN WITH GROUNDWATER CONTOURS AND FLOW DIRECTION




LEGEND

MW1 ● MONITORING WELL LOCATION AND DESIGNATION

(66.02) CALCULATED RELATIVE ELEVATION OF GROUNDWATER SURFACE

THE REYNOLDS GROUP

FIGURE 3
PLOT PLAN WITH
GROUNDWATER CONTOURS
AND FLOW DIRECTION

30215 MORNING VIEW DRIVE
MALIBU, CALIFORNIA

APRIL, 1996

# APPENDIX A

# FIELD NOTES

THE REYNOLDS GROUP

# WATER SAMPLING LOG

Project No. Malibu School Yard Date 4/4/96

Site Location 30215 Morning View Dr.

Well No. MW1 Sampling Personnel Angel Damien

Weather Clear Sunny Mild Time of Sampling

## EVACUATION DATA

Total Sounded Depth of Well Below MP 48.12 Water-Level Elevation

Depth to Water Below MP 31.58 / 31.62

Water Column in Well 16.54 Diameter of Casing 4"

Gallons per Foot .65

Gallons in Well 10.75 Gallons Pumped/Bailed Prior to Sampling 32.25 gal

Evacuation Method PVC Bailer

Controller Readout (Hz) NA

Sampling Method and Material Teflon Sampler w/ BED

| Constituents Sampled | Container Description From Lab ✓ or | Preservative |
|---|---|---|
| | | Blue Ice |

| Time | Cum. Vol. Purged | Ph | Temp. | Cond. | Comments |
|---|---|---|---|---|---|
| | 2 gal | 7.58 | 69.7 | 3240 | Turbidity 10.36 NTU |
| | 10 gal | 7.42 | 64.8 | 2800 | > 200 NTU |
| | 20 gal | 7.27 | 65.4 | 2770 | > 200 NTU |
| | 30 gal | 6.84 | 64.6 | 2770 | > 200 NTU |
| | | | | | |

Remarks Sample Turbidity 80.1 NTU

## WELL CASING VOLUMES

| | | | | |
|---|---|---|---|---|
| GAL/FT | 1¼" = 0.077 | 2" = 0.16 | 3" = 0.37 | 4" = 0.65 |
| | 1½" = 0.10 | 2½" = 0.24 | 3½" = 0.50 | 6" = 1.46 |

REYNOLDS GROUP

# WATER SAMPLING LOG

Project No. Malibu SMMSD Date 4/4/96

Site Location 30215 Morning View Drive

Well No. MW2 Sampling Personnel Angel / Damien

Weather Sunny Mild Time of Sampling

## EVACUATION DATA

Total Sounded Depth of Well Below MP 50.20 Water-Level Elevation

Depth to Water Below MP 32.66 / 32.70

Water Column in Well 17.54 Diameter of Casing 4"

Gallons per Foot .65

Gallons in Well 11.40 Gallons Pumped/Bailed Prior to Sampling 34.20

Evacuation Method PVC Bailer

Controller Readout (Hz) NA

Sampling Method and Material Teflon Sampler w/ BED

| Constituents Sampled | Container Description From Lab ✓ or | Preservative |
|---|---|---|
| | | Blue Ice |

| Time | Cum. Vol. Purged | Ph | Temp. | Cond. | Comments |
|---|---|---|---|---|---|
| | 2gal | 6.66 | 68.1 | 3000 | Turbidity = 16.48 NTU |
| | 10 | 6.33 | 67.5 | 3230 | > 200. " |
| | 20 | 6.65 | 67.6 | 3270 | > 200 " |
| | 30 | 6.66 | 67.5 | 3290 | > 200 " |
| | ~~40~~ 35 | 6.75 | 67.8 | 3290 | > 200 |

Remarks Sample Turbidity 68.3 NTU

## WELL CASING VOLUMES

| GAL/FT | | | | |
|---|---|---|---|---|
| | 1¼" = 0.077 | 2" = 0.16 | 3" = 0.37 | 4" = 0.65 |
| | 1½" = 0.10 | 2½" = 0.24 | 3½" = 0.50 | 6" = 1.46 |

REYNOLDS GROUP

# WATER SAMPLING LOG

Project No. Malibu School District Date 4/4/96

Site Location 30215 Morning View Dr.

Well No. MW3 Sampling Personnel Angel / Damien

Weather Sunny Clear Time of Sampling

## EVACUATION DATA

Total Sounded Depth of Well Below MP 48.60 Water-Level Elevation

Depth to Water Below MP 32.53 / 32.62

Water Column in Well 16.07 Diameter of Casing 4"

Gallons per Foot .65

Gallons in Well 10.44 Gallons Pumped/Bailed Prior to Sampling 31.32

Evacuation Method PVC Bailer

Controller Readout (Hz) NA

Sampling Method and Material Teflon Sampler w/ BED

| Constituents Sampled | Container Description From Lab ✓ or | Preservative |
|---|---|---|
| | | Blue Ice |

| Time | Cum. Vol. Purged | Ph | Temp. | Cond. | Comments |
|---|---|---|---|---|---|
| | 2 gal | 6.74 | 67.3 | 3000 | Turbidity 21.1 NTU |
| | 10 | 6.59 | 69.5 | 2970 | 91.3 " |
| | 20 | 6.78 | 70.2 | 3100 | 89.8 |
| | 30 | 6.73 | 69.6 | 3030 | 90.1 |
| | | | | | |

Remarks Sample Turbidity 17.8 NTU

## WELL CASING VOLUMES

| GAL/FT | | | | |
|---|---|---|---|---|
| | 1¼" = 0.077 | 2" = 0.16 | 3" = 0.37 | 4" = 0.65 |
| | 1½" = 0.10 | 2½" = 0.24 | 3½" = 0.50 | 6" = 1.46 |

THE REYNOLDS GROUP

# WATER SAMPLING LOG

Project No. SMMSD Date 4/4/96

Site Location 30215 Morning View Dr.

Well No. MW-4 Sampling Personnel Angel / Daniel

Weather Sunny Clear Warm Time of Sampling

## EVACUATION DATA

Total Sounded Depth of Well Below MP 39.84 Water-Level Elevation

Depth to Water Below MP 34.65 / 34.80

Water Column in Well 5.19 Diameter of Casing 4"

Gallons per Foot .165

Gallons in Well 3.37 Gallons Pumped/Bailed Prior to Sampling 10.12

Evacuation Method PVC Bailer

Controller Readout (Hz) NA

Sampling Method and Material Teflon Sampler w/ PED

| Constituents Sampled | Container Description From Lab ✓ or | Preservative |
|---|---|---|
| | | Blue Ice |

| Time | Cum. Vol. Purged | Ph | Temp. | Cond. | Comments |
|---|---|---|---|---|---|
| | 2 | 6.43 | 71.0 | 5460 | Turbidity 5.30 NTU |
| | 4 | 6.40 | 72.6 | 6030 | 5.70 " |
| | 6 | 6.34 | 71.9 | 6040 | 10.36 |
| | 8 | 6.30 | 73.6 | 5940 | 12.90 |
| | 10 | 6.34 | 72.6 | 6220 | |

Remarks Sample Turbidity 32 8 NTU

## WELL CASING VOLUMES

| GAL/FT | | | | |
|---|---|---|---|---|
| | 1¼" = 0.077 | 2" = 0.16 | 3" = 0.37 | 4" = 0.65 |
| | 1½" = 0.10 | 2½" = 0.24 | 3½" = 0.50 | 6" = 1.46 |

# APPENDIX B

# LABORATORY REPORT AND CHAIN OF CUSTODY DOCUMENTATION

**CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.**

April 8, 1996

Mr. Donald Hollenbeck
Vector Three Environmental Inc.
11605 So. East End Ave.
Chino, CA 91710

Dear Mr. Hollenbeck,

Enclosed please find the analytical report for the samples received on 4–4–96. The samples were received in a chilled state and analyzed as indicated on the chain–of–custody attached. In the report, the analytical results are summarized in total of three pages.

Chemical & Environmental Laboratory is a DHS certified Laboratory (certificate number: 1597). If you have any questions concerning these results and our service, please call me.

Sincerely,

Larry Zhang

Larry Zhang, Ph.D.
Laboratory Director

*14096 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 310 921-8123, Fax: 310 921-7974*

# CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

## ANALYTICAL REPORT

---M8015(G)/BTEX---

Client Name: Vector III
Project Manager: Don Hollenbeck
Project Name: Malibu School District

Date Sampled: 04-04-96
Date Analyzed: 04-04-96
Date Reported: 04-05-96

| Sample Identification | | Result (mg/L or ppm) | | | | |
|---|---|---|---|---|---|---|
| C&E ID | Sample ID | Gasoline | Benzene | Toluene | Ethylbenzene | Xylenes |
| 60404A-1 | MW 1 | ND | ND | ND | ND | ND |
| 60404A-2 | MW 2 | ND | ND | ND | ND | ND |
| 60404A-3 | MW 3 | 1.1 | 0.0213 | 0.0013 | 0.0313 | 0.0023 |
| 60404A-4 | MW 4 | 0.8 | 0.1197 | 0.0015 | 0.0096 | 0.0019 |
| 60404A-5 | BLANK | ND | ND | ND | ND | ND |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Detection Limit: | | 0.1 | 0.0003 | 0.0003 | 0.0003 | 0.0005 |

ND = Not detected at the indicated detection limit.

*14096 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 310 921-8123, Fax: 310 921-7974*

# CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

## ANALYTICAL REPORT

---M8015(Diesel)---

Client Name: Vector III
Project Manager: Don Hollenbeck
Project Name: Malibu School District

Date Sampled: 04-04-96
Date Analyzed: 04-04-96
Date Reported: 04-05-96

| Sample Identification | | Result |
|---|---|---|
| C&E ID | Sample ID | (mg/L or ppm) |
| 60404A-1 | MW 1 | ND |
| 60404A-2 | MW 2 | ND |
| 60404A-3 | MW 3 | ND |
| 60404A-4 | MW 4 | ND |
| 60404A-5 | BLANK | ND |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Detection Limit: | | 0.5 |

ND = Not detected at the indicated detection limit.

*14096 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 310 921-8123, Fax: 310 921-7974*

# CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

## QA/QC REPORT

--- M8015(G,D)/M602 ---

## I. Matrix Spike (MS)/Matrix Spike Duplicate(MSD)

Date Performed: 04-04-96
Batch #: 1404
Lab Sample I.D.: 60404A

Unit: mg/L

| ANALYTE | SPK CONC | MS (mg/L) | MS % | MSD (mg/L) | MSD % | RPD | ACP %MS | ACP RPD |
|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0200 | 0.0207 | 104 | 0.0198 | 99 | 4.4 | 80-120 | 20 |
| Toluene | 0.0200 | 0.0217 | 109 | 0.0210 | 105 | 3.3 | 80-120 | 20 |
| Ethylbenzene | 0.0200 | 0.0201 | 101 | 0.0208 | 104 | 3.4 | 80-120 | 20 |
| Xylenes | 0.0200 | 0.0187 | 94 | 0.0219 | 110 | 15.8 | 80-120 | 20 |
| Gasoline | 1 | 0.82 | 82 | 0.85 | 85 | 3.6 | 70-120 | 20 |
| Diesel | 500 | 514 | 103 | 506 | 101 | 1.6 | 70-120 | 20 |

## II. Laboratory Quality Control Check Sample

| ANALYTE | SPK CONC | RESULT | %RECOVERY | ACP % |
|---|---|---|---|---|
| Benzene | 0.0200 | 0.0194 | 97 | 80-120 |
| Toluene | 0.0200 | 0.0196 | 98 | 80-120 |
| Ethylbenzene | 0.0200 | 0.0191 | 96 | 80-120 |
| Xylenes | 0.0200 | 0.0193 | 97 | 80-120 |
| Gasoline | 1 | 0.93 | 93 | 80-120 |
| Diesel | 500 | 479 | 96 | 80-120 |

*14096 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 310 921-8123, Fax: 310 921-7974*

# CHEMICAL & ENVIRONMENTAL LABORATORIES, INC.

## CHAIN OF CUSTODY RECORD

60404A

№ 32923

| | |
|---|---|
| Client: Vector Three Environmental | Site Address: 30215 Morning View Drive |
| Project No/Name: Santa Monica - Malibu School District | Malibu, CA |
| Project Manager: Don Hollenbeck | Sampled By: Angel Cardoza |
| Tel: Fax: | Date 4/4/96 Page 1 of 1 |

| | SAMPLE ID | DATE | TIME | TYPE | CONTAINER TYPE | ANALYSES REQUIRED |
|---|---|---|---|---|---|---|
| 1 | MW1 | 4/4/96 | 11:50am | Water | 2x40ml VOA, 1L Glass | 8015 gas/8020, 8015 Diesel |
| 2 | MW2 | ↓ | 11:56am | ↓ | ↓ | ↓ |
| 3 | MW3 | | 1209 pm | | | |
| 4 | MW4 | | 1223 pm | | | |
| 5 | ~~MW~~ Blank | | 1230 pm | | | |

Remarks:

| Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|
| [signature] | 4/4/96 | 3pm | [signature] | 4-4-96 | 15:00 |
| Relinquished By: | Date | Time | Received By: | Date | Time |

14096 E. Firestone Blvd., Santa Fe Springs, CA 90670 Tel: 310 921-8123, Fax: 310 921-7974