THE SUBSURFACE INVESTIGATION AT THE METRO RAIL A-130 CORRIDOR LOS ANGELES, CALIFORNIA

Prepared by

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28733378

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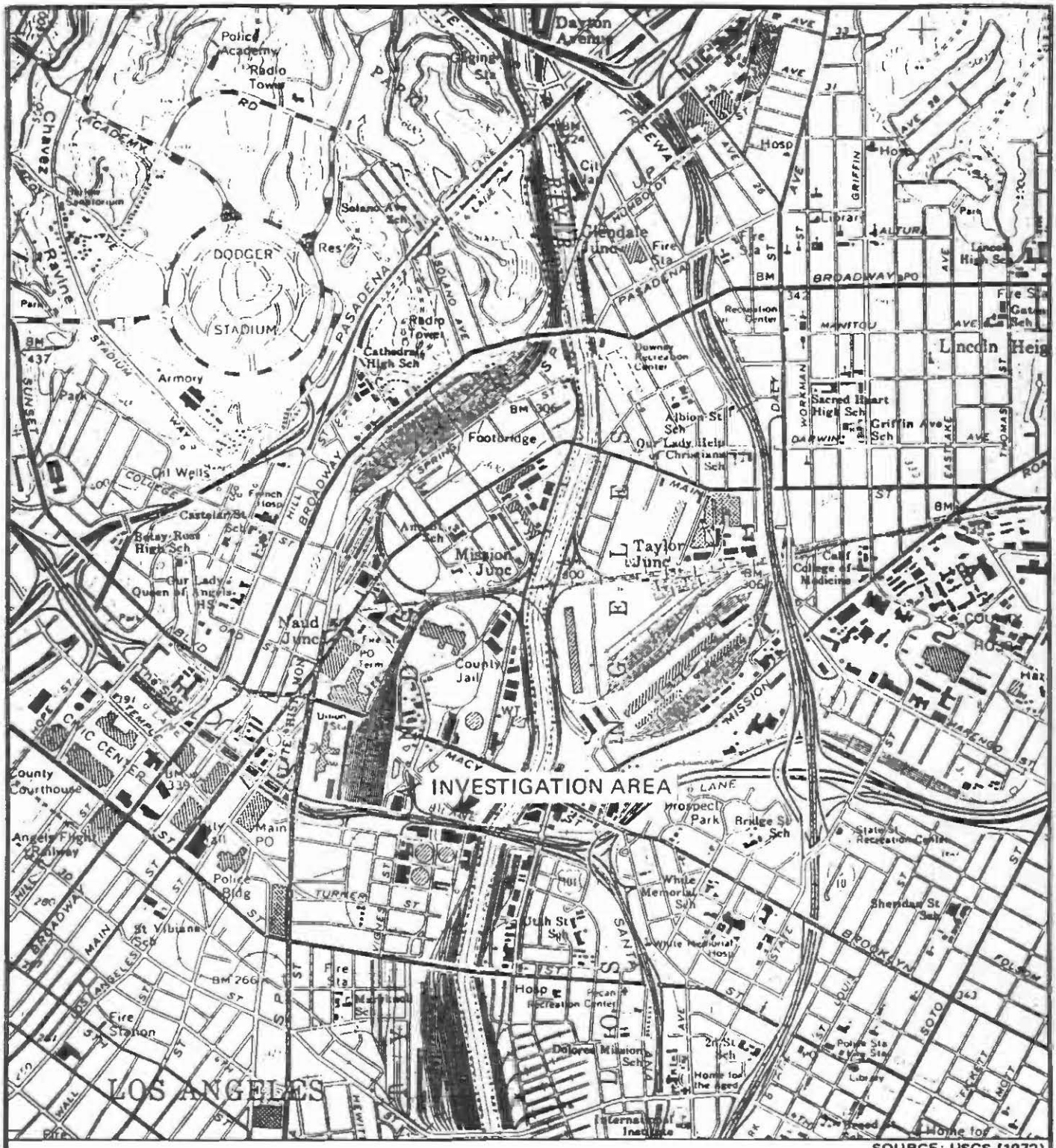
1.0 INTRODUCTION

This report documents the subsurface investigation that was conducted by The Earth Technology Corporation from September through December 1986 at the Metro Rail A130 corridor. This investigation entailed drilling 12 boreholes to depths ranging from 15 to 60 ft in the vicinity of the Denny's Restaurant and collecting soil and groundwater samples from each borehole. The drill crew and geologists experienced considerable difficulty during drilling due to refusal at shallow depths. Twenty-eight soil and 14 groundwater samples were analyzed for total petroleum hydrocarbons, organic priority pollutants, and pH.

1.1 SITE BACKGROUND

The subsurface investigation area is bordered by the Santa Ana Freeway (Route 101) and by Macy, Ramirez, Keller, and Lyon Streets in the City of Los Angeles (T1S, R13W, Sec. 27), California. Land use in the vicinity consists of industrial plants, a City technical center, an Amtrak station, and a Denny's Restaurant. Figure 1 shows the general location of the study area relative to the industrialized Los Angeles area. Figure 2 is an areal geologic map.

Land use information is not available for the vicinity of the investigation area prior to 1870. Scattered data suggest that, from 1870 to 1941, the Southern California Gas Company and the Los Angeles Gas and Electric Company used a portion of the land on Aliso Street for coal/oil gas generation. In 1943, the Southern California Gas Company ceased the gas generation operation and converted the plant into a butadiene production facility. Butadiene gas was produced through a thermal "cracking" process. This process consisted of mixing oil distillates with steam and heating the mixture in gas generators. Liquid from the condensed gas was piped to the Shell Chemical Company in Torrance for purification. The Southern California Gas Company ceased production of the butadiene gas around 1946. Southern California Gas Company sold the property about 30 years ago, and there is no available data on the use of the building or land after 1946.



SOURCE: USGS (1972)

SCALE

0 ½ 1 MILE

0 ½ 1 KILOMETER

NORTH

The Earth Technology Corporation

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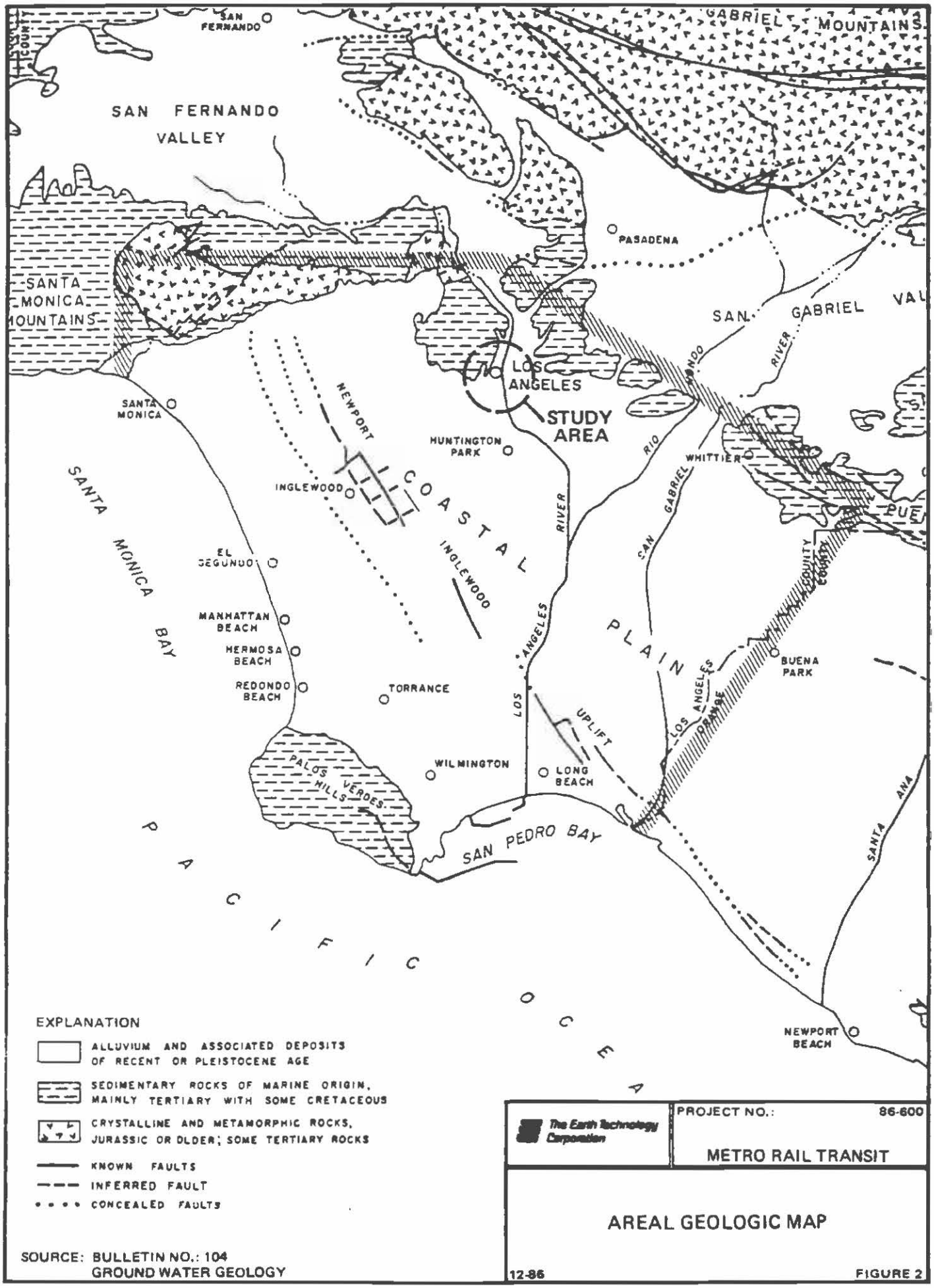
METRO RAIL

GENERAL LOCATION MAP
METRO RAIL INVESTIGATION SITE
LOS ANGELES, CA

9-86

FIGURE 1


SAN FERNANDO
SAN FERNANDO VALLEY
GABRIEL MOUNTAINS
SANTA MONICA MOUNTAINS
PASADENA
SAN GABRIEL VAL
SAN GABRIEL RIVER
RIO HONDO
LOS ANGELES
STUDY AREA
SANTA MONICA
NEWPORT
HUNTINGTON PARK
INGLEWOOD
COASTAL
INGLEWOOD
WHITTIER
RIVER
SAN GABRIEL
SANTA MONICA BAY
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
LOS ANGELES
PLAIN
BUENA PARK
UPLIFT
LOS ANGELES
ORANGE
WILMINGTON
LONG BEACH
PALOS VERDES HILLS
SAN PEDRO BAY
SANTA ANA
PACIFIC OCEAN
NEWPORT BEACH
EXPLANATION
ALLUVIUM AND ASSOCIATED DEPOSITS OF RECENT OR PLEISTOCENE AGE
SEDIMENTARY ROCKS OF MARINE ORIGIN, MAINLY TERTIARY WITH SOME CRETACEOUS
CRYSTALLINE AND METAMORPHIC ROCKS, JURASSIC OR OLDER; SOME TERTIARY ROCKS
KNOWN FAULTS
INFERRED FAULT
CONCEALED FAULTS
SOURCE: BULLETIN NO.: 104
GROUND WATER GEOLOGY
The Earth Technology Corporation
PROJECT NO.: 86-600
METRO RAIL TRANSIT
AREAL GEOLOGIC MAP
12-86
FIGURE 2

1.2 PURPOSE AND SCOPE OF INVESTIGATION

The investigation was undertaken to estimate the nature and extent of potential hazardous materials in the subsurface and groundwater at the site. The findings of this investigation will form the technical basis for developing remedial action plan and a site health and safety plan that are applicable to excavation and construction activities.

The scope of work consisted of numerous tasks. These tasks were described in the Work Plan, which was prepared by Earth Technology, and are summarized below:

- Obtain necessary permits for drilling activities.
- Prepare and implement a site specific Health and Safety Plan.
- Prepare and implement an on site decontamination program.
- Set up procedures for storing drums containing soil and waste water on site and for transporting the drums to an acceptable disposal site
- Conduct a geophysical investigation to assist in finding locations where drilling may be possible.
- Conduct a subsurface soil and groundwater sampling program.
- Conduct an OVA and hydrogen sulfide gas detection program.
- Submit environmental samples for chemical analysis to an approved laboratory.
- Evaluate data developed during the site investigation.
- Calculate the estimated quantity of contaminated soil existing at the site.

- Prepare and submit a report documenting the findings, assessments, conclusions, and recommendations resulting from the investigation.

2.0 GEOLOGY AND HYDROLOGY

2.1 SITE GEOLOGY

REGIONAL GEOLOGY

The investigation area is located within an alluviated lowland known as the Los Angeles Basin. The basin is underlain by a structural depression composed primarily of marine and non-marine clastic sedimentary rock. Specific features to the basin area are:

- The Newport-Inglewood and Whittier fault zones, which separate the basin into northwestern, southwestern, northeastern, and central blocks
- The N70W Los Angeles anticline, a major geologic influence to the central block
- A narrow fault and folding zone of the south limb of the Elysian Park anticline.

The Metro Rail A-130 Corridor is within the central block and within the boundaries of major Newport-Inglewood, Whittier, and Santa Monica fault zones. There are no known active or potentially active faults identified within the study area.

The Los Angeles City oil field is another feature specific to the study area. The field is in the east-central part of the metropolitan area and is located along the south side of the narrow fault and folding zone on the south limb of the Elysian Park Anticline. It consists of three distinct production areas - eastern, central, and western. Plate 1 shows the location of the oil field in relation to the site.

SITE GEOLOGY

The Basin bedrock is exposed in Elysian Park, about 2 miles north of the site. The bedrock is composed of about two thousand ft of sandy siltstone and interbedded conglomerate of the Fernando Formation; and oil-bearing sandstone, shale, and siliceous shale of the Puente Formation. Borehole records from a previous study show the Puente Formation to be 100 ft below the surface within the corridor area. Visual identification of soil samples by Earth Technology's geologist shows that subsurface soils are mainly composed of:

- An upper fill consisting of silty sand and concrete that overlies an old brick road approximately 5 ft below the surface
- An upper unit of silty sand and clayey sand that grades to sand
- A middle unit of gravelly sands and cobbles
- A lower unit of sand that grades to gravelly sands and cobbles.

In some instances of auger refusal, it appeared that large cobbles or boulders were encountered.

2.2 SITE HYDROLOGY

The site is located in the Los Angeles Forebay area. Plate 2 shows the boundary of the forebay area. A semiperched aquifer consisting of coarse sands and gravels is common near the surface in the Forebay area. Thickness of the aquifer is 0 to 60 feet, and occurs as irregular patches. The Gasper and Exposition aquifers exist west and south of the Los Angeles River and in the vicinity of the study area (Department of Water Resources, Bulletin No. 104). These aquifers are from 10 ft to greater than 100 ft in thickness and consist mainly of sand and gravel with clay and silt lenses. The aquifers are not differentiated from each other and are overlain by alluvium. Historically, wells were installed in the Gasper aquifer. These existing well yields are high.

Based on visual observation and site borehole logs, it appears that the site geology consists of mixed alluvium, bedrock, and river gravel and cobble deposits.

Groundwater on site was encountered at approximately 30 ft below the surface. Water-bearing material at the site consists of coarse sands and gravelly sands with occasional lenses of clay. The water-bearing zones appear to have an upper and lower unit separated by gravel and cobble.

Based on regional groundwater data from the Los Angeles County Flood Control District, the 1975 static groundwater table is 50 to 100 ft below the bedrock surface in the vicinity of Union Station, approximately 1 mile west of the study site, which indicates regional perched conditions.

3.0 SITE INVESTIGATION

3.1 DRILLING AND SOIL SAMPLING

Twenty-eight drilling attempts were made at the site. Twelve boreholes were drilled to a maximum depth of 60 ft using a B-54 drill rig with 6-in and 8-in outer diameter hollow stem augers. Borehole locations are presented in Figure 3. Ninety-one soil samples were collected from the 12 boreholes. Site daily activity records are presented in Appendix A.

Samples were collected at five-ft intervals using a split spoon sampler containing brass liners. The sampler was opened as soon as it was removed from the borehole. Brass liners were removed and sealed with polycarbonate caps, labelled, placed in airtight sample containers, and placed on ice in preparation for delivery to the analytical laboratory. All samples were accompanied by chain-of-custody forms (Appendix B).

After each sampling event, the sampler was cleaned with an Alconox wash, followed by two water rinses and a distilled water rinse. Downhole sampling equipment and tools, including augers, and the work area of the drill rig were decontaminated between each borehole using a steam cleaner. Boreholes were grouted with cement to the surface. Spoils were stored in a central area on site in 55-gallon drums and identified by borehole. Spoils will be disposed of by a qualified disposal company following laboratory analysis of soil samples.

Borehole logs are presented in Appendix C. Boreholes were logged by The Earth Technology geologist. Observations of the soil were made visually for color grain size and texture. Soils were identified using the Unified Soil Classification System.

Fill material was encountered in most boreholes from about 0.5 to 5 ft. The fill consists of dark brown silty sand, which overlies an old brick road. Between 6 and approximately 15 ft, pieces of brick, wood, concrete, pipes, and

massive building foundations were encountered. It was impossible to identify whether soils immediately beneath the brick were also fill material.

Below 15 ft, the soil consists mainly of coarse sand, sandy gravel, and cobble. Occasional lenses of clayey sands and boulders were encountered.

A tarlike odor was detected in boreholes BH-05E, BH-08A, BH-08D, BH-09A, BH-10, and BH-11 at depths from approximately 15 to 25 ft. A blackish oily substance was encountered in the following boreholes and at the following depths:

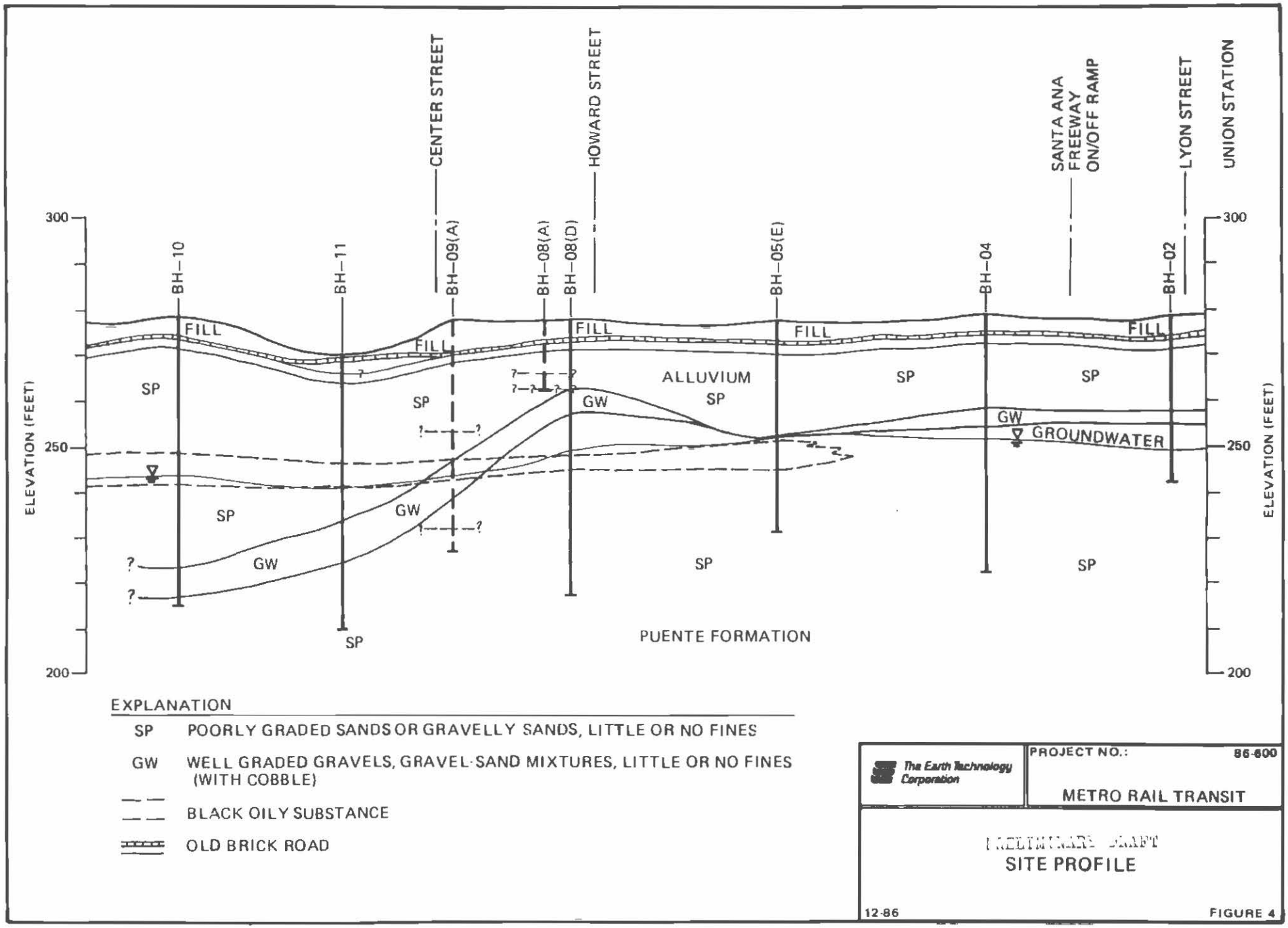
1. BH-05E 24 to 45 ft
2. BH-09A 25 to 35 ft
3. BH-08A 15 ft
4. BH-08D 29 to 45 ft
5. BH-10 29 to 40 ft
6. BH-11 25 to 26 ft

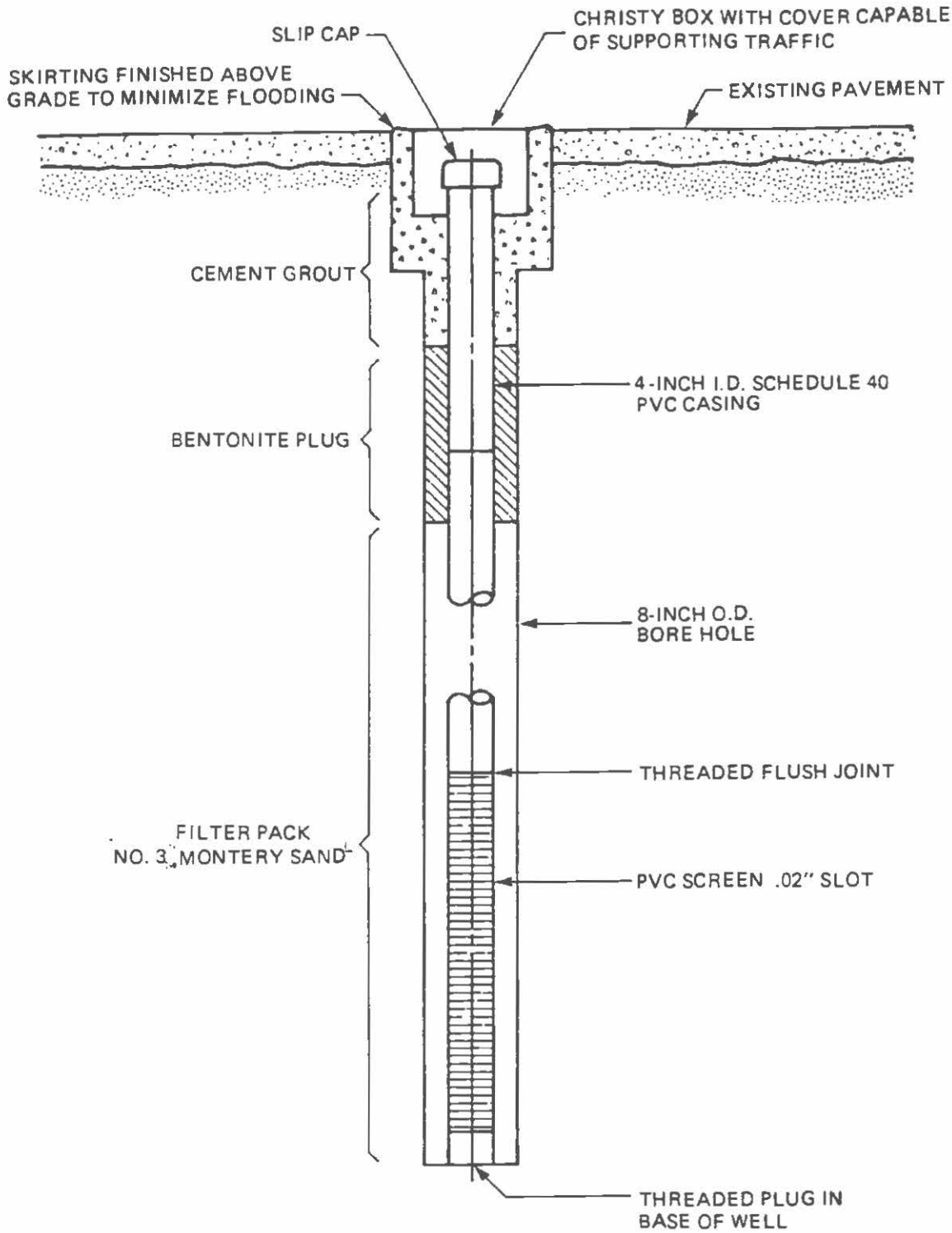
Odors and discolored soils were not observed in boreholes BH-01, BH-02, BH-04, BH-06A, BH-06, and BH-07H. Figure 4 shows a preliminary cross-section of subsurface conditions at the site.

3.2 GROUNDWATER QUALITY INVESTIGATION

Two groundwater monitoring wells (BH-02 and BH-11) were installed on site to evaluate groundwater conditions upgradient of the site and at the water table, and downgradient of the site below the water table. A typical monitoring well installation specification is presented in Figure 5. The locations of the monitoring wells are shown on Figure 3. Groundwater sampling records for the monitoring wells are presented in Appendix D.

Schedule 40, 4-inch, threaded PVC riser and screen were assembled as it was inserted into the augers to a designated depth. The augers were withdrawn as a sand pack was placed approximately 2 to 3 ft above the slotted PVC screen. Once the sand pack was placed, a bentonite seal was installed by placing dry bentonite pellets to a depth 3 ft above the sand pack. The remainder of the


CENTER STREET
HOWARD STREET
SANTA ANA FREEWAY ON/OFF RAMP
LYON STREET
UNION STATION
BH-10
BH-11
BH-09(A)
BH-08(A)
BH-08(D)
BH-05(E)
BH-04
BH-02
300
250
200
ELEVATION (FEET)
FILL
SP
GW
ALLUVIUM
GROUNDWATER
PUENTE FORMATION
EXPLANATION
SP POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
GW WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES (WITH COBBLE)
BLACK OILY SUBSTANCE
OLD BRICK ROAD
The Earth Technology Corporation
PROJECT NO.: 86-600
METRO RAIL TRANSIT
PRELIMINARY DRAFT
SITE PROFILE
12-86
FIGURE 4



NOT TO SCALE

The Earth Technology Corporation

PROJECT NO.:

METRO RAIL TRANSIT

TYPICAL MONITORING WELL

9-86

FIGURE 5

borehole was sealed with a cement grout to the surface. All monitoring well components were steam cleaned prior to their use. No cements or glues were used on the PVC risers or screens. Monitoring wells were equipped with a protective cover, and securely grouted in place.

The monitoring wells were developed by using a bailer and an air-surge pump. Approximately 110 and 55 gallons of water were removed from BH-11 and BH-02, respectively. The samples were collected approximately two weeks after the completion of the well development program. Twenty-five to thirty gallons were bailed from each well until the water pH stabilized and the groundwater cleared. Water samples were obtained using a PVC bailer. One duplicate sample was collected and labelled with a non-existing identification (BH-15), to insure the integrity of the laboratory procedure. Groundwater samples were collected from the bottom of each borehole and from two monitoring wells installed on site.

Samples were properly labelled, iced, and packed for transport to the laboratory. All samples were accompanied by chain-of-custody forms. Appendix B contains the chain-of-custody forms and laboratory data sheets.

Well development water, decontamination water, and wash and rinse water were stored on site in a mobile 4,000-gallon capacity Baker tank.

Baker tank waste waters were analyzed for chemical content by a qualified disposal company before removal from site.

3.3 LABORATORY ANALYSES

A total of 28 soil samples from the 12 boreholes was selected for laboratory analysis (Table 1). This includes a black, oily, or viscous substance from an abandoned underground storage tank or sump found at borehole BH-08(A). Sample selection was based on visual observations, headspace OVA readings, and the soil material encountered. At least one sample per borehole was chosen.

One groundwater sample from each of the 10 boreholes and the two monitoring wells was collected for laboratory analysis. (See Table 2.)

TABLE 1. SOIL AND GROUNDWATER SAMPLES COLLECTED AND ANALYZED FOR METRO RAIL CORRIDOR A130

Borehole No.	Completion Depth (ft)	Total Soil Samples	Laboratory Analysis Samples: Total Water Samples	Laboratory Analysis Samples: Total Soil Samples[2]
BH-01	44	8	1	2 (30)
BH-02[1]	35	8	2	2 (35)
BH-04	57	8	1	2 (25)
BH-05E	45	8	1	3 (35,40,45)
BH-06	55	9	1	2 (30)
BH-06A	35.5	8	1	2 (30)
BH-07(H)	45	8	1	1 (30)
BH-08(A)[3]	15	2	1	2 (15)
BH-08(D)	60	10	1	6 (30,45,60)
BH-09(A)	50	8	1	3 (30,50)
BH-10	55	9	1	2 (30)
BH-11[1]	60	5	2	1 (25,30)
12		91	14	28

1. Samples were taken before and after well installation.
2. Numbers in parentheses indicate sample depths in ft.
3. The 15-ft sample from borehole BH-08A may be from a subsurface storage tank.

TABLE 2. SUMMARY OF LABORATORY ANALYSIS OF GROUNDWATER[1] IN METRO RAIL CORRIOOR A130

Constituent	BH-01 30'	BH-02 35'	BH-04 57'	BH-06A 35'	BH-06 55'	BH-03 43.5'	BH-08D 60'	BH-02 Well	BH-11[2] Well	BH-7H 50'	BH-9A 50'	BH-05 45'	BH-10 55'
TPH, mg/l	*	1.4	*	*	*	2.0	2.5	*	*	2	4	9	128
pH, unit	6.66	6.59	7.81	*	*	7.42	7.48	6.32	6.38	6.88	7.22	7.20	7.19
Naphthalene	*		42	*	*	45	140	*	*	*	6,100	*	900
Acenaphthene	*	*	32	*	*	43	37	*	*	*	*	*	*
Phenanthrene	*	*	26	*	*	53	40	*	*	80	700	200	200
Ethylbenzene	*	*	*	*	113	230	500	*	7	*	26	6	*
Total Xylenes	*	*	*	*	6	41	163	*	*	*	330	*	*
Acenaphthylene	*	*	*	*	*	21	27	*	*	100	300	100	200
Fluorene	*	*	*	*	*	43	42	*	*	*	200	*	*
Anthracene	*	*	*	*	*	14	*	*	*	*	100	*	*
Fluoranthene	*	*	*	*	*	12	*	*	*	40	*	*	100
Pyrene	*	*	*	*	*	16	16	*	*	80	500	200	200
Toluene	*	*	*	*	*	*	6	*	3	*	110	*	*
Benzene	*	*	*	*	*	*	*	*	*	*	550	*	16
1,2-Dichloroethane	*	*	*	*	*	*	*	*	15	*	*	*	*
Chloroform	*	*	*	*	*	*	*	*	*	*	*	*	*
4-Methyl-2-Pentanone	*	*	*	*	*	*	*	*	*	*	*	*	*
Acetone	*	*	*	*	*	*	*	*	*	34	230	*	310
2-Methylnaphthalene	*	*	*	*	*	*	*	*	*	*	300	*	60
Chrysene	*	*	*	*	*	*	*	*	*	*	100	*	100
Benzo(a) Pyrene	*	*	*	*	*	*	*	*	*	*	100	*	100
Benzo(k) Fluoranthene	*	*	*	*	*	*	*	*	*	*	*	*	100
Sulfide (mg/l)	*	*	*	*	*	*	*	*	*	2.02	*	0.51	2.23

* - Not Detected
1. Concentration μg/l (ppl) unless otherwise noted
2. Average of replicate samples.

Soil samples were analyzed for organic priority pollutants (EPA Methods 624, 625, 8240, and 8270), total petroleum hydrocarbons (EPA Method 418.1 for soil and Method 8015 for water), and pH (EPA Method 150.1). (See Table 3.) Groundwater samples from boreholes BH-05, BH-07(H), BH-09(A) and BH-10 were also analyzed for total sulfides (EPA Method 9030). From the site history, it is suspected that the contaminants are polynuclear aromatics (coal tar derived hydrocarbons) that may have originated from the earlier gasification and/or butadiene production activities in their area.

Laboratory quality assurance/quality control (QA/QC) included, in addition to reagent blank and standards, 10 percent duplicate and 10 percent spikes (surrogates). The replicate and recovery data are within the acceptable ranges of reproducibility and accuracy described by the California Department of Health Services.

TABLE 3. SUMMARY OF LABORATORY ANALYSIS OF SOIL IN METRO RAIL CORRIDOR A130

Constituent	BH-01 30'	BH-02 35'	BH-04 25'	BH-6A 30'	BH-06 30'	BH-8D 30'	BH-8D 45'	BH-8D 60'	BH-8A[2] 15'	BH-11 25'	BH-11 30'	BH-07[3] 30'		BH-9A 30'	BH-9A 50'	BH-5E 35'	BH-5E 45'	BH-10 35'
TPH	2.5	2.5	3			46	*	4.	3,400	10,800	640	23	40	130	5	32	10	12,200
pH	4.60	8.07	7.44			8.04	8.52	8.25	8.10	10.35	9.03	7.50		8.89	8.19	8.96	7.42	8.63
Chloroform	*	*	*	*	*	*	*	*	*	1.4	*	*	*	*	*	*	*	*
Naphthalene	*	*	*	*	*	*	*	10.3	14,000	119	17	*	*	220	*	*	*	*
Phenanthrene	*	*	0.5	*	*	35	*	0.5	6,100	*	3	60		120	*	3	6	*
Fluoranthene	*	*	0.4	*	*	24	0.2	0.9	5,200	*	2	31		69	*	*	6	*
Pyrene	*	*	0.8	*	*	36	0.3	1.6	7,600	*	2	49		159	4	3	12	*
bis (2-Ethylhexl) Phthalate	*	*	*	0.7	*	*	0.7	*	*	*	*	*	*	*	*	*	*	*
Fluorene	*	*	*	*	*	16	*	0.1	1,100	*	*	13		41	*	*	*	*
Anthracene	*	*	*	*	*	17	*	0.4	700	*	*	10		28	*	*	*	*
Benzo(a) Anthracene	*	*	*	*	*	13	*	0.3	1,400	*	*	*	*	*	*	*	*	*
Chrysene	*	*	*	*	*	16	*	0.4	1,400	*	*	12		34	*	*	*	*
Benzo(b) Fluoranthene	*	*	*	*	*	7	*	0.2	1,000	*	*	2	*	*	*	*	*	*
Benzo(a) Pyrene	*	*	*	*	*	9	*	0.2	2,100	*	*	12		34	*	*	*	*
Indeno(1,2,3-cd) Pyrene	*	*	*	*	*	4	*	*	2,000	*	*	9	13	26	*	*	*	*
Benzo(g,h,i) Perylene	*	*	*	*	*	4	*	*	3,100	*	*	13		38	*	*	*	*
Ethylbenzene (µg/kg)	*	*	*	*	*	680	*	*	*	11.7	2.0	3,450		5,600	*	*	300	*
Total Xylenes (µg/kg)	*	*	*	*	*	143	*	*	130	2.0	*	600		600	*	*	*	*
Di-n-Butylphthalate	*	*	*	*	*	*	0.7	*	*	*	*	*	*	*	*	*	*	*
Carbon Disulfide (µg/kg)	*	*	*	*	*	*	*	46	*	*	*	*	*	*	*	*	*	*
Benzene	*	*	*	*	*	*	*	*	40	1.0	0.8	*	1*	1.1	*	*	*	*
Toluene	*	*	*	*	*	*	*	*	42	*	*			8.8	*	*	*	*
Styrene	*	*	*	*	*	*	*	*	130	*	*	*	*	*	*	*	*	*
2-Methylnaphthalene	*	*	*	*	*	*	*	*	3,100	*	2	*	*	56	*	*	*	*
Acenaphthylene	*	*	*	*	*	*	*	*	5,100	*	1	24		63	*	*	*	*
Acenaphthene	*	*	*	*	*	*	*	*	500	*	*	2		43	*	*	*	*
Benzo(k) Fluoranthene	*	*	*	*	*	*	*	*	1,100	*	*	*	*	*	*	*	*	*

* Not Detected
1. Unites in mg/kg (ppm) unless otherwise noted.
2. Material may be from tank/sump.
3. Average of duplicate samples.

THE FACILITIES SHOWN ON THIS DRAWING REPRESENT THOSE BUILDINGS, STRUCTURES AND BURIED PIPES THAT EXISTED DURING THE OPERATION OF A COAL GASIFICATION PLANT DURING THE EARLY 1900'S (APPROX. 1870–1955).
THE LOCATIONS SHOWN ARE APPROXIMATE AND ARE BASED ON HISTORICAL DATA, AERIAL PHOTOS AND MAPS.
FORMER FACILITIES MAY INCLUDE BURIED PIPES, VALVE BOXES, FOUNDATIONS, SUMPS, CONCRETE, STEEL, BRICK AND OTHER DEBRIS.

CONSTRUCTION LIMIT
TEMPORARY CONSTR LIMIT
CONSTRUCTION LIMIT
VIGNES
LYON STREET
FREEWAY
PURIFIER
BH–06(A) 35.5 / 27.5
BH–06 55 / 29
SCRUBBERS
R/W
TOWER
COOLING
DENNY'S
BH–01 44 / 29.5
ONRAMP
BH–02 35 / 30
STREET
BH–05(E) 45 / 25
REBAR CONCRETE
R/W
BUILDING
R/W
BH–04 57 / 28
MATCH LINE STA YR 96+00
BURIED PIPES
CONSTRUCTION LIMIT
STREET
RAMIREZ
CONSTRUCTION LIMIT
VIGNE
PIPER
CENTER
20 10 0 20 40

EXPLANATION
- BOREHOLE LOCATION
- MONITORING WELL
- UNSUCCESSFUL LOCATIONS
- 23 — BOREHOLE COMPLETION DEPTH
- 10 — GROUNDWATER DEPTH

SOURCE: SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The Earth Technology Corporation
PROJECT NO.: 86-600
METRO RAIL TRANSIT
SITE PLOT PLAN
12-86
FIGURE 3

TE:

THE FACILITIES SHOWN ON THIS DRAWING REPRESENT THOSE BUILDINGS, STRUCTURES AND BURIED PIPES THAT EXISTED DURING THE OPERATION OF A COAL GASIFICATION PLANT DURING THE EARLY 1900'S (APPROX. 1870-1955).

THE LOCATIONS SHOWN ARE APPROXIMATE AND ARE BASED ON HISTORICAL DATA, AERIAL PHOTOS AND MAPS.

FORMER FACILITIES MAY INCLUDE BURIED PIPES, VALVE BOXES, FOUNDATIONS, SUMPS, CONCRETE, STEEL, BRICK AND OTHER DEBRIS.

OLD CENTER STREET CONTAINS PAVEMENT AND BURIED PIPES.

ALISO ST.

OLD CENTER STREET

SANTA ANA FREEWAY

UNKNOWN STRUCTURES

CENTER ST

PURIFICATION PLANT

PURIFIER

CONCRETE

BH-TANKS

BH-07(H)

BH-09(A)

CONCRETE PIPE

CONCRETE

PURIFIER

REBAR

BH-08(A)

BH-08(D)

MATCH LINE STA YR 96+00

BH-13 CONCRETE

BH-14 CONCRETE

BH-11

PURIFIER PLANT

SCRUBBERS

BUILDING

BURIED PIPES

COAL-GAS-OIL GENERATOR BUILDING

BH-10

POWER HOUSE

RAMIREZ STREET

CONSTRUCTION LIMIT

KELLER STREET

PIPER CENTER

N4,132,000 E4,718,200

N4,132,200 E4,718,000

R/W

20 10 0 20 40

SOURCE: SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

EXPLANATION

- BOREHOLE LOCATION
- MONITORING WELL
- UNSUCCESSFUL LOCATIONS
- TANK LOCATION
- 17/11 — BOREHOLE COMPLETION DEPTH / GROUNDWATER DEPTH

The Earth Technology Corporation

PROJECT NO.: 86-600

METRO RAIL TRANSIT

SITE PLOT PLAN

12-86

FIGURE 3

4.0 ADDITIONAL INVESTIGATIONS

4.1 UNDERGROUND PIPE AND CABLE INVESTIGATION

Each designated borehole location was surveyed for underground pipes and cables. Two to three areas in the vicinity of the planned boreholes were cleared for drilling by a subcontractor using geophysical equipment. The locator equipment used a sensor that detected subsurface metallic pipes and cables. However, the equipment is limited in its capabilities, and cannot detect wiring or piping located beneath concrete. Six cleared borehole locations were successfully drilled. Numerous drilling attempts at borehole locations BH-05, BH-07, BH-09, and BH-10 were unsuccessful. Concrete foundations, brick foundations, and abandoned pipelines were encountered from about 0.5 to 15 ft below the surface. Figure 3 shows locations where obstacles were encountered. A summary of subsurface obstacles encountered while drilling is provided in the daily site activity records.

4.2 CPT INVESTIGATION

On November 17 to 19, Earth Technology conducted field probing using an electronic cone penetrometer (CPT). The objective of this investigation was to locate four borehole sites by probing with the CPT. Utilizing the hydraulics of the CPT, Earth Technology personnel pushed 1 1/4-inch diameter rods fitted with a "dummy" tip into the soil in specific areas in which borehole locations were required. This method proved efficient in finding borehole locations that a drill rig, equipped with hollow stem augers, could penetrate.

The target depth of probing for the CPT was 40 ft. It was evaluated that if the CPT were able to attain a depth of 40 ft, there should be no deeper artificial obstructions to impede drilling. During pushing of the rods, hydrogolic pressure was monitored. Refusal was noted when pressures in excess of 1,800 to 2,000 psi were applied.

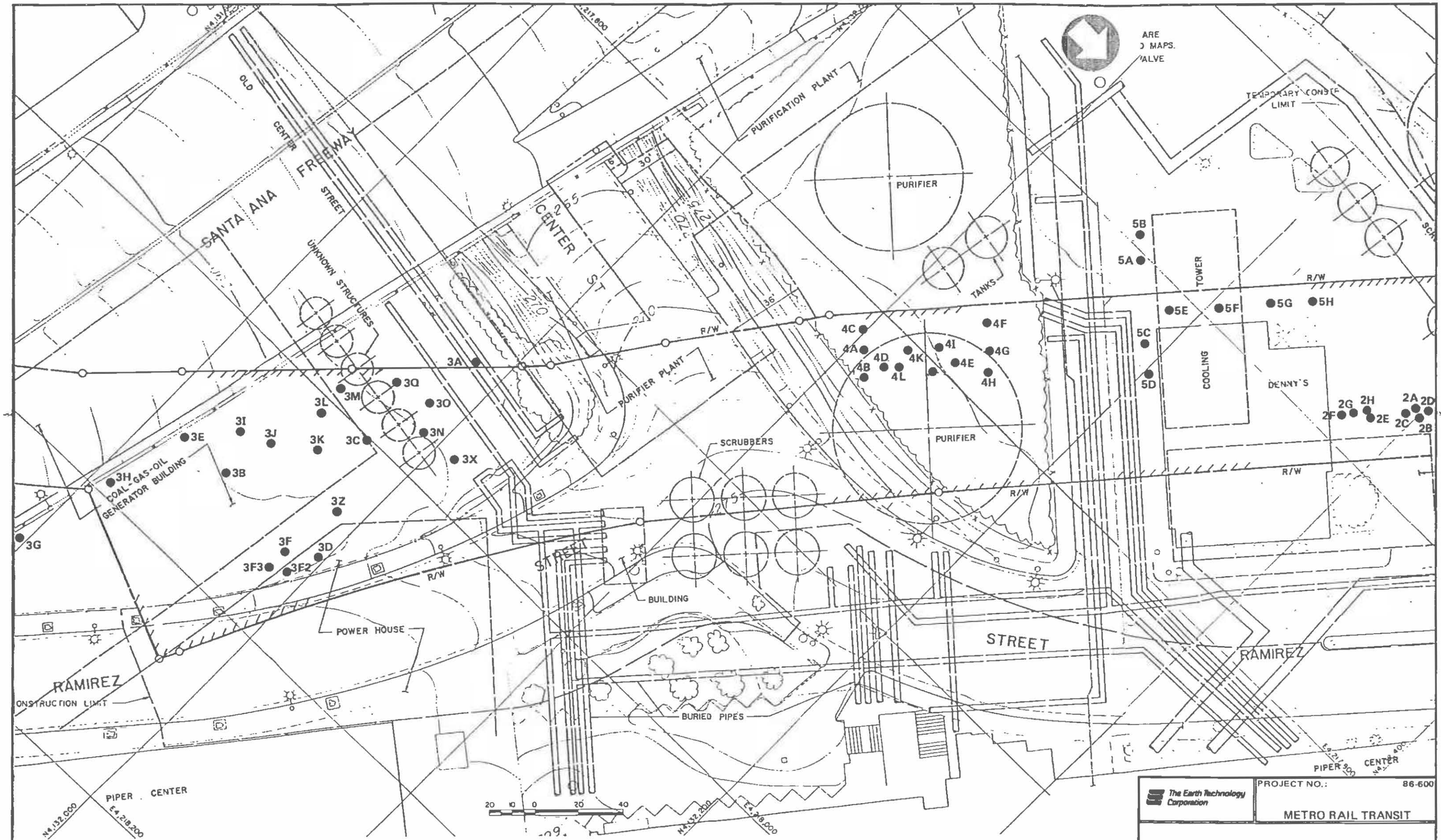
To locate the four borehole locations, Earth Technology personnel attempted a total of 48 CPT probings (See Table 4 and Figure 6). Although the target depth of 40 ft was not attained in any of the probing attempts, a decision was made that 20 ft was likely adequate. This decision proved correct, and the CPT method was successful in finding four locations suitable for drilling.

Decontamination of the CPT rods was accomplished by using a steam cleaner affixed to a washing device below the CPT truck. As the rods were retrieved from the ground, they passed through the washing device before entering the truck. Possibly contaminated wash water was pumped from the washing device to a 55-gallon drum. At the end of the day wash water collected in the drum was transferred to the 4,000-gallon-capacity Baker tank designated for all contaminated water generated at the site. In probing locations where a depth of 25 ft or greater was atained, the probeholes were back filled to reduce the possibility of the hole becoming a pathway for contaminants to enter the uppermost water-bearing zone. A bentonite slurry was pumped into the probehole through the rods as they were removed from the ground to ensure that grouting of the entire hole was accomplished.

Field personnel worked in Level C personal protection equipment, because it was assessed that the possibility of contact with contaminants was potentially hazardous. This level of protection was also used during grouting and decontamination procedures.

TABLE 4. SUMMARY OF CPT PROBINGS AT METRO RAIL CORRIDOR A130

CPT Location	CPT Site	CPT ID	Completion Depth	Remarks
NE Denny's Parking Lot	No. 2	2A	1.50-	Refusal
		2B	2.51	Refusal
		2C	19.28	Refusal
		2D	1.60	Refusal
		2E	27.87	Refusal, hard @ 15'-19'
15'-19'				
		2F	19.38	Refusal
		2G	17.63	Refusal
		2H	18.04	Refusal, hard @ 10'-18'
"Pit Area" Center & Ramirez Street	No. 3	3A	1.19	Refusal
		3B	0.56	Refusal
		3C	11.15	Refusal
		3D	18.70	Refusal
		3E	5.53	Refusal
		3F	21.31	
		$3F_2$	24.65	16'-17' "crunching"
		$3F_3$	31.62	15'-17' hard. 19' crunching
		3G	3.63	Refusal
		3H	0.49	Refusal
		3I	1.54	Refusal
		3J	0.74	Refusal
		3K	0.64	Refusal
		3L	0.93	Refusal
		3M	0.52	Refusal
		3N	1.73	Refusal
		3O	20.09	Refusal
		3Q	3.83	Refusal
		3X	0.87	Refusal
		3Z	8.74	Refusal
SW Denny's Parking Lot	No. 4	4A	30.00	4'-5' "crunching"
		4B	17.44	
		4C	25.76	
		4D	17.41	
		4E	8.10	Refusal
		4F	20.80	Refusal
		4G	4.10	Refusal
		4H	21.00	
		4I	14.70	Refusal
		4J	17.00	Refusal
		4K	3.20	Refusal
		4L	17.70	Refusal



SOURCE: SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The Earth Technology Corporation

PROJECT NO.: 86-600

METRO RAIL TRANSIT

CPT INVESTIGATION AREA

12-86

FIGURE 6

5.0 RESULTS AND DISCUSSION

5.1 SOIL CONTAMINATION

The depths of soil samples that were analyzed vary from 25 to 60 ft, but most were from depths of 30 ft or greater. The concentrations of total petroleum hydrocarbons ranged from 2.5 (in boreholes BH-1 and BH-2) to over 12,000 mg/kg (in borehole BH-10) (Table 3). However, most of the samples contained less than 50 mg/kg; there appeared to be no correlation between the headspace OVA readings and total petroleum hydrocarbons levels. This suggests that petroleum hydrocarbons are probably waste oil, coal tar, and other high boiling point hydrocarbons.

As described in Section 3.1, the materials encountered in most boreholes were fill in the first 5 ft, and pieces of wood, brick, concrete, pipes, and building foundations for the next 10 ft. No odors or stained soils were observed in boreholes BH-01, BH-02, BH-04, BH-06A, and BH-06. These boreholes are in the western portion of the A-130 corridor. Tarlike odor was detected at depths from approximately 15 to 25 ft in one borehole (BH-05E) in the western portion of the A-130 Corridor and in five boreholes in the eastern portion. Soil stained with a black to brown oily substance was encountered at depths from 24 to 29 ft in five of these six boreholes. A blackish, viscous, oily substance was found at a depth approximately 15 ft in borehole BH-08A. The thickness of the soil stain zone varied, but was between 5 and 11 ft. The stained soil in this zone appeared to contain high levels of total petroleum hydrocarbons.

Soil pH's ranged from 4.60 (BH-1) to 10.35 (BH-35) with most pH's being between 8.0 and 9.0.

Of the 28 samples analyzed, five samples contained measurable levels of organic priority pollutants, most of which are polynuclear aromatics (Table 3). The blackish, oily sample from borehole BH-8A (15 ft) exhibited the largest number and highest concentration of polynuclear aromatics. (Naphthalene was measured at 14,000 mg/kg and benzo(a) pyrene at 2,000 mg/kg.) A few purgeable

aromatic hydrocarbons including benzene, toluene, and xylene were also detected in this sample.

Three samples from borehole BH-08D, located approximately 30 ft north of borehole BH-08A, contained polynuclear aromatics with concentrations ranging from 0.1 to 36 mg/kg. The concentration were higher in the 30-ft sample than in the 45-ft or 60-ft sample. Low levels of two purgeable aromatics --ethylbenzene (680 μg/kg) and xylene (143 μg/kg)--were also found in the 30-ft sample.

The 30-ft sample from borehole BH-09A contained the second highest levels of organic priority pollutants. Naphthalene was detected at 220 mg/kg, pyrene at 159 mg/kg, benzo(a) pyrene at 34 mg/kg, ethylbenzene at 5,600 μg/kg, and xylene at 600 μg/kg. The 50-ft sample from this borehole contained 4 μg/kg pyrene and non-detectable levels of other priority pollutants.

The 30-ft sample from borehole BH-07H contained 12 polynuclear aromatics, with concentrations ranging from 2 to 60 mg/kg. Ethylbenzene and xylene were found at 3,450 and 600 μg/kg, respectively.

The two samples from borehole BH-11 contained high levels (10,800 and 640 mg/kg) of total petroleum hydrocarbons, but only 119 and 17 mg/kg naphthalene were detected. The source of these petroleum hydrocarbons cannot be identified from the laboratory data.

A field investigation has recently been conducted for the Los Angeles Busway Project, which is located in close proximity to the A-130 Corridor (Woodward-Clyde Consultants, 1986). The contaminants identified (principally polynuclear aromatics) are similar to our findings, but their number and concentrations are larger than those found in our investigation.

5.2 GROUNDWATER CONCENTRATION

Of the 13 groundwater samples analyzed, three were found to have no detectable levels of organic priority pollutants (Table 2). These samples were collected from boreholes BH-01, BH-02, and BH-06A, all on the west side of Denny's. Traces of ethylbenzene (7 μg/l), toluene (3 μg/l) and 1, 2- dichloethane

(<15 μg/l) were detected in well BH-11. Groundwater samples from boreholes BH-04, BH-05, BH-07, BH-08, BH-09, and BH-10 were contaminated with varying levels of polynuclear aromatics. No chlorinated solvents (e.g., trichloroethylene, tetrachloroethylene) were found in the groundwater samples. Sulfides at low concentrations were found in three of the four groundwater samples (BH-07H, BH-05E, and BH-10) that were analyzed for this contaminant.

We recognize the high probability of cross contamination when collecting a groundwater sample in a uncased borehole and without proper development. However, the data suggest that the shallow groundwater at boreholes BH-05, BH-07, BH-08, and BH-09 has been contaminated with the chemicals found in the unsaturated zone.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the field investigation, the following conclusions can be drawn:

- Materials in the first 15 ft consist of fill, wood, brick, concrete pipes, and building foundations. Contaminated soil appears to be limited to the zone above the groundwater (at 30 ft deep) and in the eastern portion of the A-130 Corridor.

- There is insufficient data to estimate, with reasonable accuracy, the extent of soil contamination and the quantity of contaminated soil existing at the site.

- There is evidence that contamination from past site operations has extended beyond the border of the A-130 Corridor.

- The contaminants identified are principally polynuclear aromatics that are coal-tar derivatives. There is no evidence of soil or groundwater contamination by chlorinated solvents.

- The contaminants identified are consistent with the data in a previous investigation for the Los Angeles Busway Project. However, the number and concentrations of contaminants appear to be smaller than those reported in the Busway area.

- High levels of total petroleum hydrocarbons are consistent with field observations of a brown to black oily substance in stained soil. These levels do not correlate well with headspace OVA readings or concentrations of polynuclear aromatics in the samples.

- Groundwater in most of the boreholes is contaminated with polynuclear aromatics, purgeable aromatic hydrocarbons such as ethylbenzene and xylene, and sulfides. The levels of these contaminants are high and, in most instances, correlate well with the soil analysis data.

- Recommendations on site excavation procedures were submitted in the Phase II Health and Safety Plan and Remedial Action Plan.

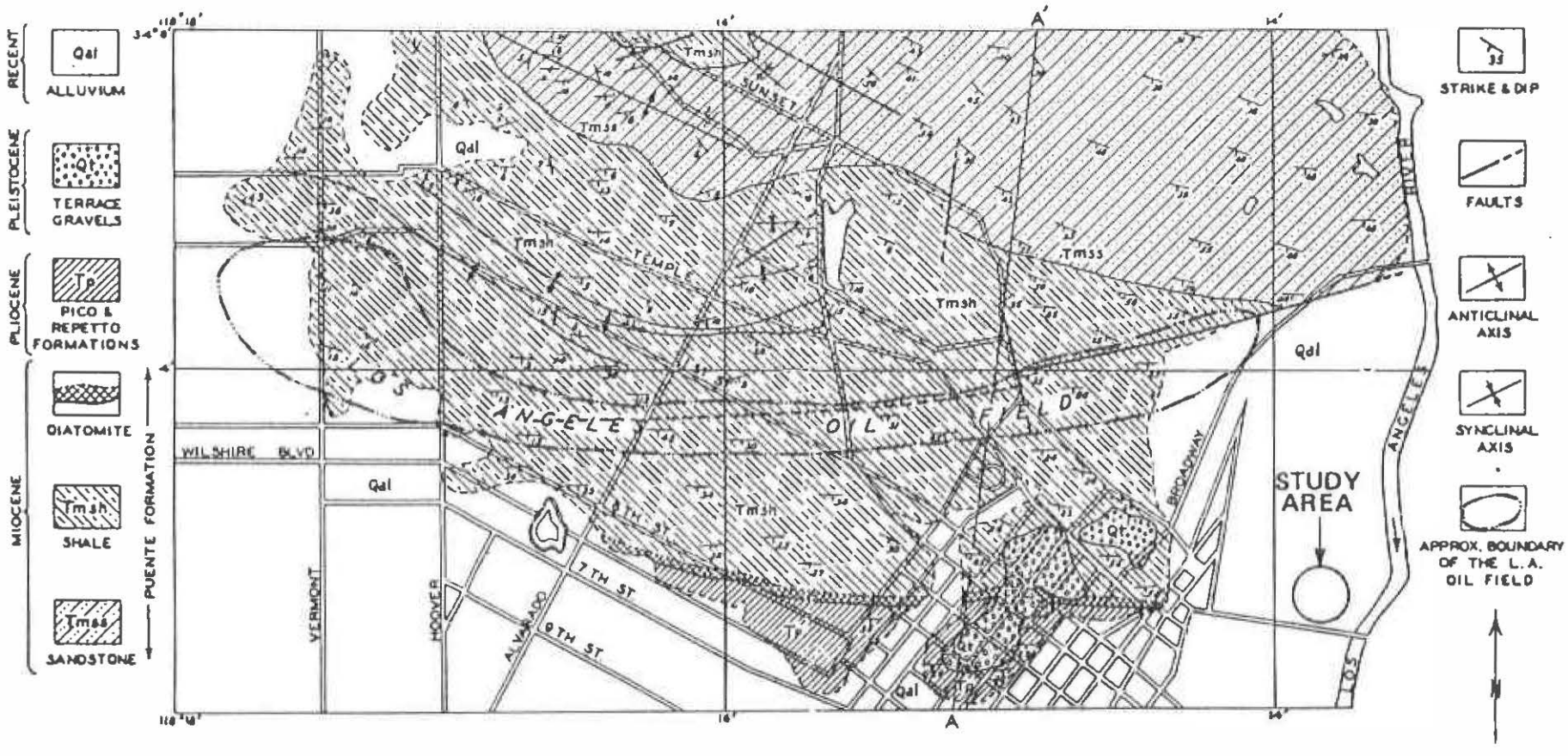
7.0 REFERENCES

State of California, 1943. Department of Natural Resources, Division of Mines, Geologic Formations and Economic Development of the Oil and Gas Fields of California, San Francisco, March.

State of California, Department of Water Resources, 1961. Planned Utilzation of the Ground Water Basins of the Coastal Plain of Los Angeles County, Bulletin No. 104, Appendix A, Ground Water Geology, June.

U.S. Geological Survey. Los Angeles Quadrangle - Los Angeles County, 7.5 Minute Series Topographic, U.S. Department of the Interior.

Woodward-Clyde Consultants, 1986. Hazardous Materials Investigation at the Construction Site of the Los Angeles Busway, Volumes 1 and 2, prepared for C. C. Meyers, Inc., Pico Rivera, California.



NOT TO SCALE

SOURCE: BULLETIN NO. 118, CALIFORNIA DIVISION OF MINES

The Earth Technology Corporation

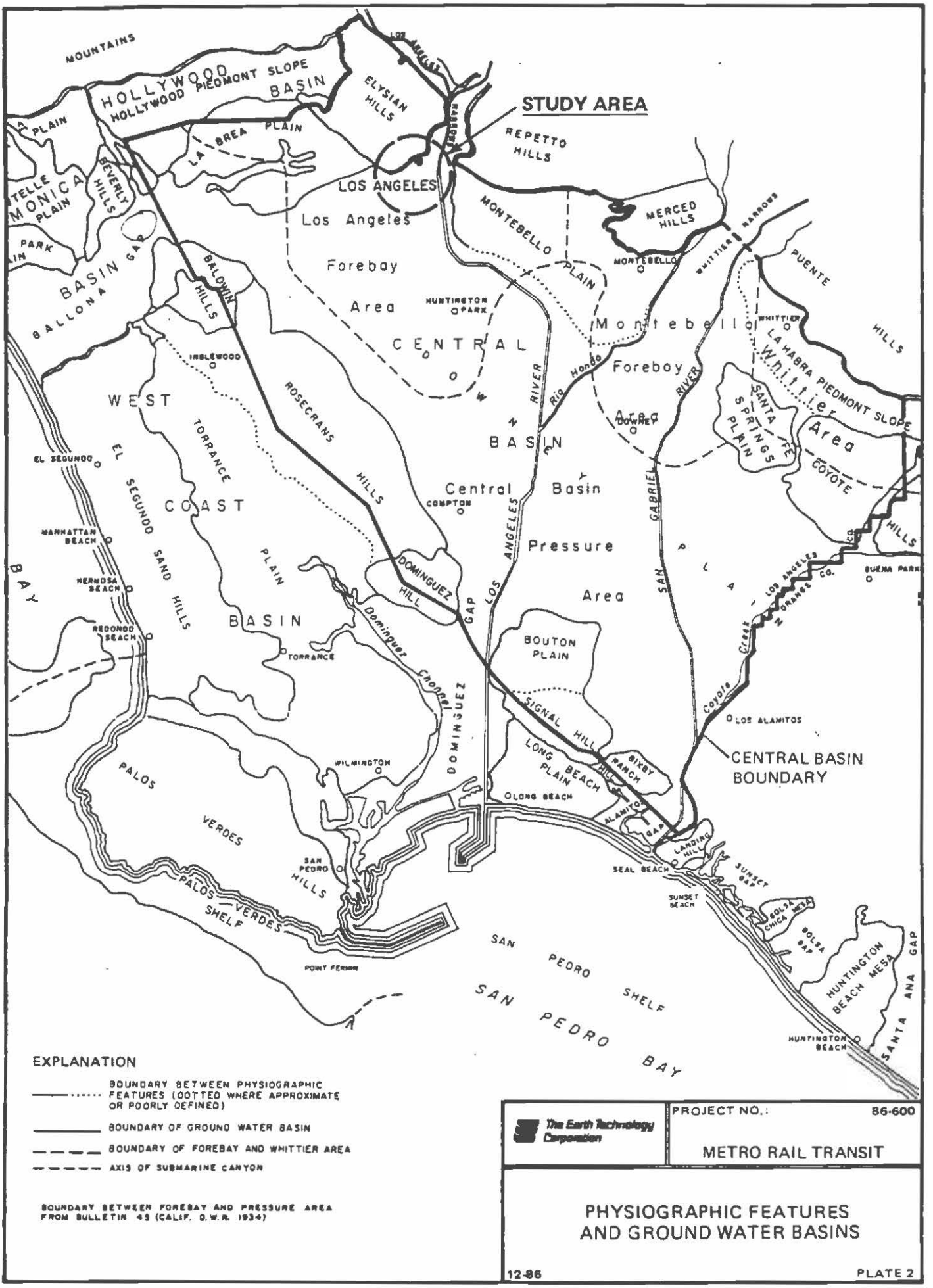
PROJECT NO.: 86-600

METRO RAIL TRANSIT

LOS ANGELES CITY OIL FIELD IN RELATION TO SITE

12-86

PLATE 1


STUDY AREA
HOLLYWOOD PIEDMONT SLOPE
HOLLYWOOD BASIN
LOS ANGELES
Los Angeles Forebay Area
CENTRAL BASIN
WEST COAST BASIN
Central Basin Pressure Area
Montebello Forebay Area
Whittier Area
LA HABRA PIEDMONT SLOPE
SANTA FE SPRINGS PLAIN
BOUTON PLAIN
LONG BEACH PLAIN
MONTEBELLO PLAIN
LA BREA PLAIN
REPETTO HILLS
MERCED HILLS
PUENTE HILLS
BALDWIN HILLS
ROSECRANS HILLS
TORRANCE
EL SEGUNDO SAND HILLS
DOMINGUEZ HILL
SIGNAL HILL
LONG BEACH
ALAMITOS GAP
LANDING HILL
SEAL BEACH
SUNSET GAP
SUNSET BEACH
BOLSA CHICA MESA
BOLSA GAP
HUNTINGTON BEACH MESA
SANTA ANA GAP
HUNTINGTON BEACH
PALOS VERDES HILLS
PALOS VERDES SHELF
POINT FERMIN
SAN PEDRO SHELF
SAN PEDRO BAY
DOMINGUEZ GAP
DOMINGUEZ CHANNEL
LOS ANGELES RIVER
RIO HONDO
SAN GABRIEL RIVER
SANTA ANA RIVER
COYOTE CREEK
CENTRAL BASIN BOUNDARY
EL SEGUNDO
MANHATTAN BEACH
HERMOSA BEACH
REDONDO BEACH
TORRANCE
WILMINGTON
COMPTON
LOS ALAMITOS
BUENA PARK
WHITTIER
MONTEBELLO
HUNTINGTON PARK
INGLEWOOD
BEVERLY HILLS
ELYSIAN HILLS
EXPLANATION
BOUNDARY BETWEEN PHYSIOGRAPHIC FEATURES (DOTTED WHERE APPROXIMATE OR POORLY DEFINED)
BOUNDARY OF GROUND WATER BASIN
BOUNDARY OF FOREBAY AND WHITTIER AREA
AXIS OF SUBMARINE CANYON
BOUNDARY BETWEEN FOREBAY AND PRESSURE AREA FROM BULLETIN 45 (CALIF. D.W.R. 1934)
The Earth Technology Corporation
PROJECT NO.: 86-600
METRO RAIL TRANSIT
PHYSIOGRAPHIC FEATURES AND GROUND WATER BASINS
12-86
PLATE 2

APPENDIX A
SITE DAILY ACTIVITY LOGS

DAILY ACTIVITY REPORT
Site Walk Only

SITE Metro Rail PROJECT NO. _____ DATE 9/3/86

DRILLING CONTRACTOR _____ DRILLER _____

_____ HELPER _____

RIG USED _____ CASING USED _____ SAMPLERS USED _____

START TIME _____ END TIME _____

PROTECTION LEVEL B C D

MONITORING EQUIPMENT HNU 11.7 10.2 OVA RAD EXPL

DESCRIPTION OF WORK PERFORMED Completed a site walk to evaluate the borehole locations using the map supplied to us by Metro Rail. ~~Fifteen~~ 14 borehole locations were identified and marked with red paint. The exception is at Dennys the boreholes were not marked in order to not draw Dennys employees attention to us. Photographs of the areas were taken & a brief description was summarized for our records.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Map contained the new freeway exit along with the existing freeway exit. The map was confusing and resulted in taking more time to accurately locate the borehole sites.

ATTACHMENTS

1. Boring Log(s) y (n) _____
   Gamma Log(s) y (n) _____
2. Well Installation Details y (n) _____
3. Water Level Observation y (n) _____
4. Conversation Memo(s) y (n) _____

REPORT PREPARED BY _____ DATE _____

PROJECT: METRO RAIL

Land use in the vicinity of the borehole location: BH-01, BH-02, BH-03

Light Industrial Type facility and an Amtrak station and track

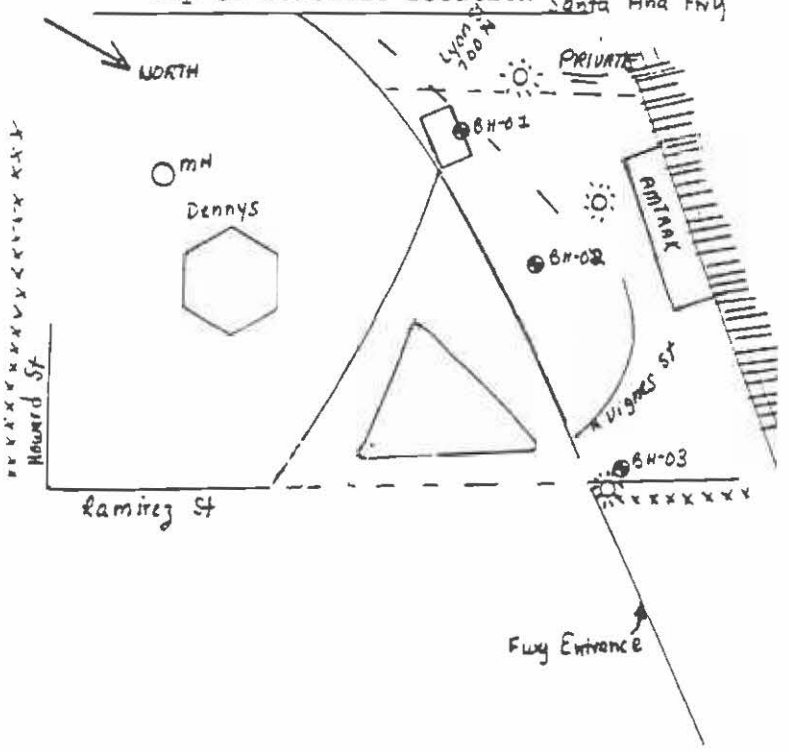
Address (if Possible) and ownership

Appears to be owned by the state. However there is a private facility in the imediate vicinity of borehole BH-01. Street sign reads 700 North Vignes Street, Los Angeles

Site conditions (include: overhead lines, pipes, access to the area)

Water line and electrical conduits (street lighting) are evident. Access to the area is from the freeway entrance (Santa Ana), and a drill rig would not block freeway or normal traffic.

Map of borehole location



original Location - After underground pipe & cable investigation the location was moved about 10 feet ←.
12/17/86 - B. Fontes

BH-01

Barbara Fontes

Date 9/3/86

Freeway Entrance

BH-02 (Building 550 Ramirez St. and 580 (Dennys') is in the Background)

BH-03 was not Completed. Site is location of previous subsurface investigation (B. Fontes, 12/17/86)

BH-03 700 N. Vignes and Ramirez St. (Building 550 Ramirez St. is in the Background)

Land use in the vicinity of the borehole location: BH-04

Dennys restaurant is located approximately 50 feet south of the traffic island.

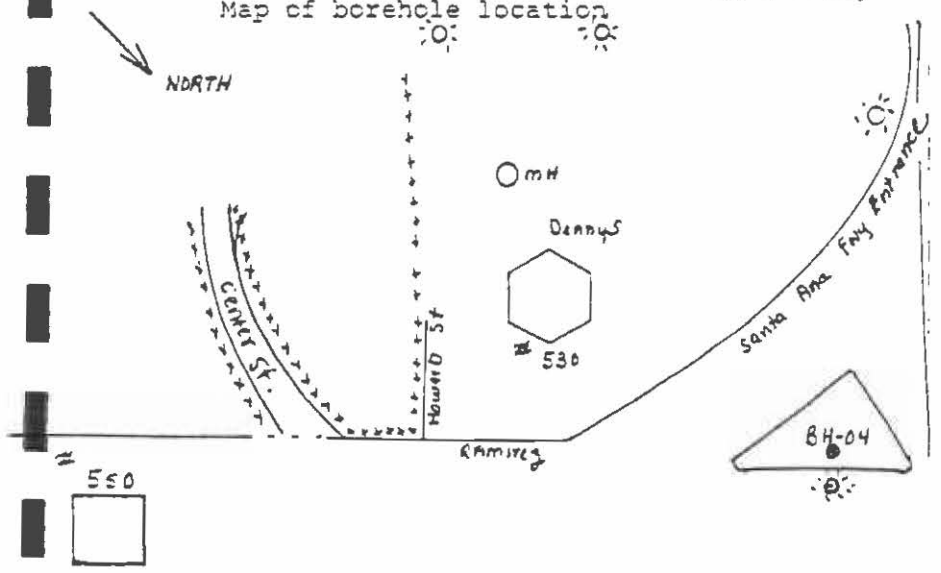
Address (if Possible) and ownership

Borehole location is on the traffic island between Dennys restaurant (Ramirez St.), and the Santa Ana. Fwy entrance in Los Angeles

Site conditions (include: overhead lines, pipes, access to the area)

Underground electrical wiring suspected because of the street lights.

Map of borehole location



BH-04

Barbara Fontes

Date 9/3/86

Land use in the vicinity of the borehole location: BH-05, BH-06, BH-06A

Boreholes locations are in the rear parking lot of Dennys resturant. Across from Dennys is a Technical Center (business).

Address (if Possible) and ownership

530 Ramierz Street. Los Angeles

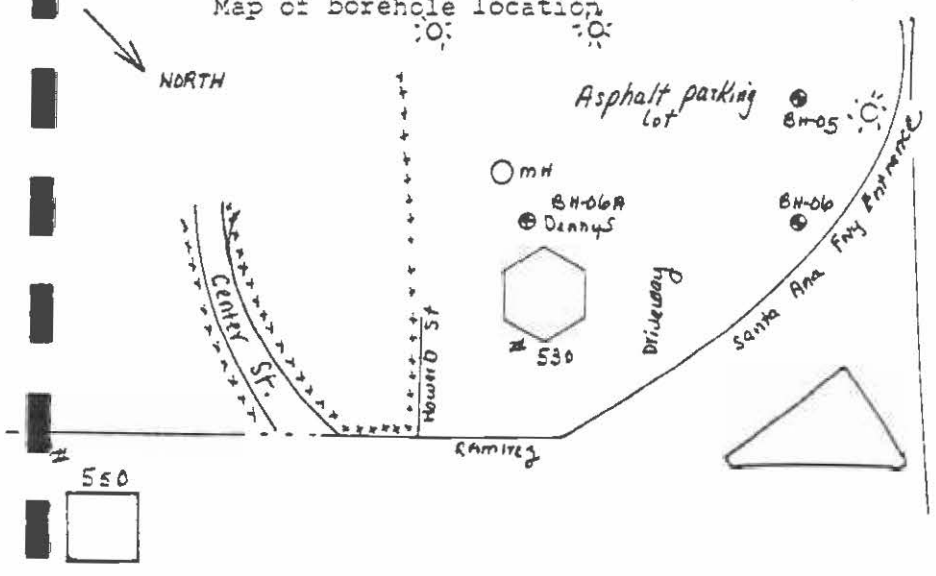
Mr. David Mansouri is the manager/owner

Earth Technology received verbal permission to access the property (Tuesday, Sept 2, 1986 - Larry Banks as witness)

Site conditions (include: overhead lines, pipes, access to the area)

Sewer manhole cover is located in the rear of the parking lot. It is possible that the electrical wiring for the street and highway lights exist beneath the asphalt pavement. Entrance to the borehole locations is through Dennys' driveway and Howard Street

Map of borehole location



Photo

Did Not ~~Photograph~~ mark the area in order to keep a good relationship with the manager/owner.

Mr. Mansouri requested that ETC not disturb the customers unless we have to. Also his employees are not aware of the situation.

Barbara Fontes

Date 9/3/86

← BH-05

↑
BH-06A

BH-06
Apx. 15 feet from Resturant
back door

PROJECT: METRO RAIL

Land use in the vicinity of the borehole location: BH-07 - BH-08 + BH-09 are all located within the fenced area adjacent to Dennys restaurant.

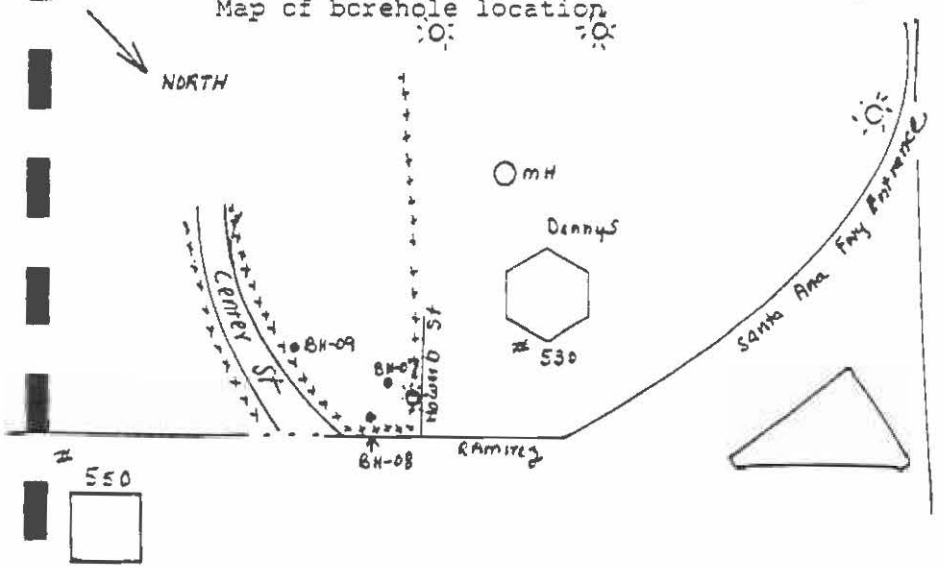
Address (if Possible) and ownership

530 Ramirez Street
Los Angeles
Cal Trans is the owner

Site conditions (include: overhead lines, pipes, access to the area)

It appears that two tanks have been removed from the site. The exposed subsurface contains large diameter piping and blocks of cement. Drum containers are on site with yellow lables facing in a direction which is not visible from the street or parking lot.

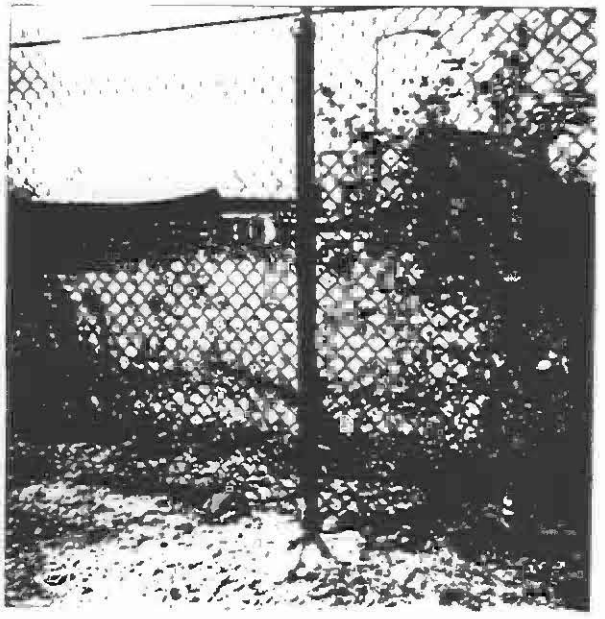
Map of borehole location



BH-07

Barbara Fontes

Date 9/3/86



Both: BH-08 Looking through the chain Link fence the inactive 102 Brewing building can be seen

BH-09
Background view and large piping that has been excavated

Fenced area adjacent to Dunnys. Owner is believed to be Cal trans.

PROJECT: METRO RAIL

Land use in the vicinity of the borehole location: BH-10, BH-11, BH-12, BH-13, and BH-14 are located across the Street from the Technical Centex business facility

Address (if Possible) and ownership

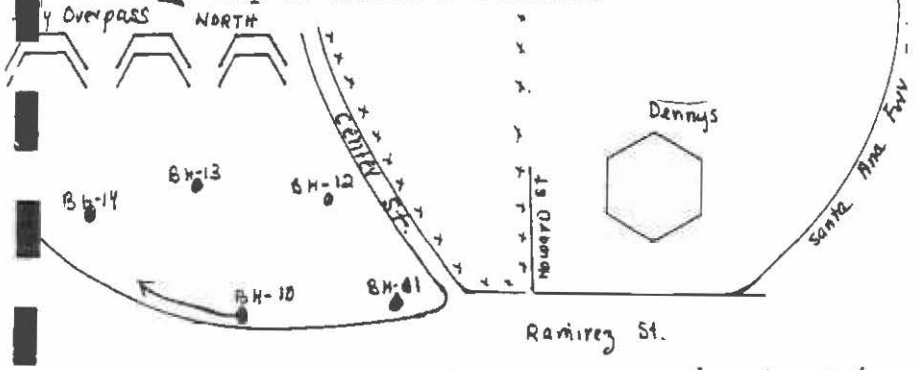
Directly across from 550 Ramirez Street

Ownership: At this time unknown

Site conditions (include: overhead lines, pipes, access to the area)

Excavation ~~has been~~ is evident in the vicinity of BH-12, BH-13, and BH-14. Concrete Piles for the new (planned) exit has been installed. Excavated areas contain piping and large blocks of Cement. A drill Rig may have problems getting to BH-12, BH-13 and BH-14 Care Park under Fwy. Overpass

Map of borehole location

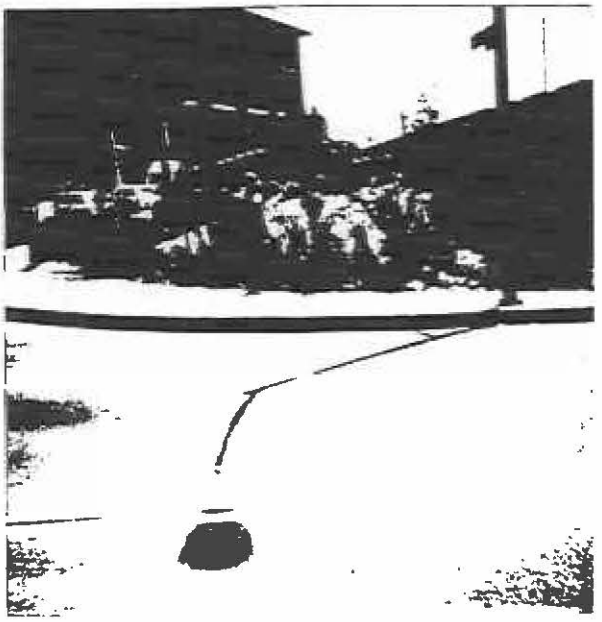


BH-10 was moved because it is located in area of previous investigation. BH-10 was moved to an area cleared of underground pipes and Cables.

12/17/86 B. FonTes

Barbara FonTes

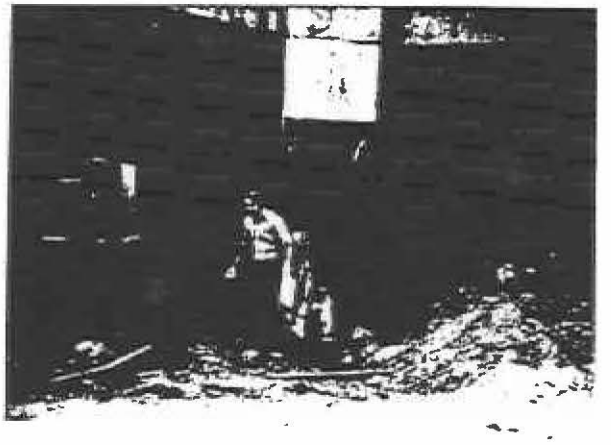
Date 9/3/86



BH-11. ← Technical Center
550 Ramirez Street

BH-13

BH-12



BH-14

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0000 DATE 9/24/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6 " augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 AM END TIME 12:00 NOON

PROTECTION LEVEL B C D

MONITORING EQUIPMENT HNU 11.7 10.2 OVA RAD EXPL

DESCRIPTION OF WORK PERFORMED Spectrum completed their survey of borehole areas BH-05, BH-06 and BH-06A. Their instruments indicated a large pipe beneath the surface of the parking lot. Spectrum cleared three areas in the immediate area of the borehole locations. Poly tanks delivered a baker 4000 capacity (gallons) tank to be used to store waste water and well development water. The tank is stored on RTD property at 700 North Vignes Street. The tank is corrosive resistant and is mobil. Caltrans Resident Engr. L.J. Sapine and associate, and Metro Rail Transit Senior Structural Engineer Bomi M. Ghadiali visited the site today

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Drillers didn't have the correct ~~respitory~~ respiratory equipment. Their supervisor delivered the correct equipment. Rain has prevented us from drilling today. I (Caite geologist) felt that the safety equipment could not be efficiently used during the rain, and the constant dumpage runoff is a source of potential contamination of the soil samples (cross contamination)

ATTACHMENTS

1. Boring Log(s) y (n)
   Gamma Log(s) y (n)
2. Well Installation Details y (n)
3. Water Level Observation y (n)
4. Conversation Memo(s) (y) n Page 7
5. Log Book

REPORT PREPARED BY Barbara Fontes DATE 9/24/86

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0002 DATE 9/25/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6 " augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 am END TIME

PROTECTION LEVEL B (C) (D)

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Completed borehole BH-06 (Gennys Parking lot) to a depth of 55 feet. Encountered groundwater at 30 feet below the surface. Collected random samples from the cuttings for a sheen test. The results of the test indicate an oily type substance in the sandy clay material at approximately 35 feet below the surface. OVA gave background readings of 2 to 4 ppm during the entire drilling activity. The wind helped ventilate the working area.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Drillers never grouted boreholes from the bottom up and were having problems with trying something new. If it becomes too time consuming we will use the old conventional way of grouting in the shallower boreholes (using a cement mixer + pouring the grout down the hole)

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	y	(n)	
3. Water Level Observation	(y)	n	Groundwater @ 30 feet
4. Conversation Memo(s)	y	n	
5. Log Book	(y)	n	page 7 and 8

REPORT PREPARED BY DATE

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0003 DATE 9/26/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 AM END TIME 3:00 pm

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Drillers couldn't complete Borehole BH-05. Spectrum had two locations marked for drilling, and both boreholes weren't suitable for drilling. The first borehole contained brick from the old road foundation and rebar at about 5 feet below ground surface. The second borehole contain the same brick at about 5 feet below the surface and concrete about 10 feet below the surface. Because of the possibility of encountering a pipe, or cable ~~the~~ contained in the concrete the borehole was abandoned. BH-06A was completed at a depth of 35.5 feet below the surface. Groundwater is at about 27 feet below the surface. Soil sample BH-06A-6 and a water sample was collected for laboratory analysis.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION The explosive meter instrument is not working properly. Since we are moving toward an area where contaminants were found, I thought it wise not to start another borehole.

ATTACHMENTS

1. Boring Log(s) (y) n
   Gamma Log(s) y (n)
2. Well Installation Details y (n)
3. Water Level Observation (y) n Groundwater @ 27 feet
4. Conversation Memo(s) (y) n
5. Log Book (y) n

REPORT PREPARED BY Barbara Fortes DATE 9/26/86

Page 9

Note: Samples picked up by Chemical Research at 6:30 pm (Capt.)

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0007 DATE 9/29/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6 " augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 9:00 AM END TIME apx. 1:00 pm

PROTECTION LEVEL B (C) (D)

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Borehole BH-08 was completed to a depth of 10 feet. The old brick road was encountered at approximately three feet. The borehole was not completed and all drilling was halted at 11:30 AM because the air monitoring equipment was not functioning properly.

Spectrum completed clearing boreholes BH-01, BH-02, BH-09, BH-08, BH-09, BH-11, BH-12, BH-13. Spectrum instruments indicate a lot of metal objects (pipes + cables) beneath the surface. The worse areas are located at 700 N. Vignes St. and access from the Technical Center.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Air monitoring equipment is not functioning properly. Shutdown all work until the safety equipment is working. The safety equipment was taken to ETC laboratory for repairs

ATTACHMENTS

1.	Boring Log(s)	y (n)	
	Gamma Log(s)	y (n)	
2.	Well Installation Details	y (n)	
3.	Water Level Observation	y (n)	
4.	Conversation Memo(s)	(y) n	
5.	Log Book		

REPORT PREPARED BY Barbara Fontes DATE 9/30/86

We wanted to auger to ~~water~~ ground water, but we thought that the substance may be contained in a tank. If we went through a tank, we could be responsible for creating a conduit for migration of the contamination.

We tried three times to go beneath the surface in BH-08.

BH-07 was completed to approximately two feet trying twice. Rebar and concrete was encountered both times. A carbine ~~tooth~~ tooth on the drill bit was broken (sheared off).

BH-09 was completed to approximately 4 feet trying twice. Concrete was encountered both times. Piping was evident in the area, and the drillers are becoming worried about hitting tanks.

the entire area consist of concrete reinforced with natural rock material, rail road tracks (ties) rebar and piping.

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0002 DATE 10/1/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6 " augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 END TIME 2:00

PROTECTION LEVEL B (C) (D)

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Tried to set up at BH-08 twice and encountered rebar and concrete. We had to go back into the original hole. However to prevent cross contamination we plan to obtain a soil sample at 15 feet instead of at 10 feet. At approximately 13.5 feet the driller indicated that he may have gone through a barrier; possibly a tank. the hammer was pulled and it was covered with an greasy, oily substance. OVA didn't record any values from the hammer. A sample was collected from 13.5 to approximately 15 feet. The sample ~~DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION~~ consist of a black substance which was oily and smelled of tar. OVA readings after sample removal and around the borehole was at ± 20ppm and fluctuating. later OVA readings at the hole were at greater than 300ppm.

ATTACHMENTS

1.	Boring Log(s)	y	n	
	Gamma Log(s)	y	n	
2.	Well Installation Details	y	n	
3.	Water Level Observation	y	n	
4.	Conversation Memo(s)	y	n	
5.	Log Book	(y)	n	Page 11, Photos taken.

REPORT PREPARED BY Barbara Fontes DATE 10/1/86

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0002 DATE 10/2/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6 " augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME _____ END TIME 10:00 pm

PROTECTION LEVEL B (C) (D)

MONITORING EQUIPMENT HNU 11.7 10.2 OVA RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Completed borehole BH-01 (Vignes Street) to a depth of about 45 feet when we encountered large cobblers. The driller pulled up the augers to try to by-pass what ever was preventing the augers to advance further. However the borehole became crooked and we still didn't get by the cobbles. Borehole BH-04 (freeway off ramp) located on the traffic island was completed to a depth of 57 feet. Both boreholes were grouted to the surface, and the equipment decontaminated. Borehole cuttings, and decontamination & wash water were stored on site in 55-gal drums with lids. Samples sent to the laboratory: BH-04 @ 57 feet - Water BH-04 @ (30) feet - soil BH-01 @ 30 feet - Water BH-01 @ (22.5) feet - soil

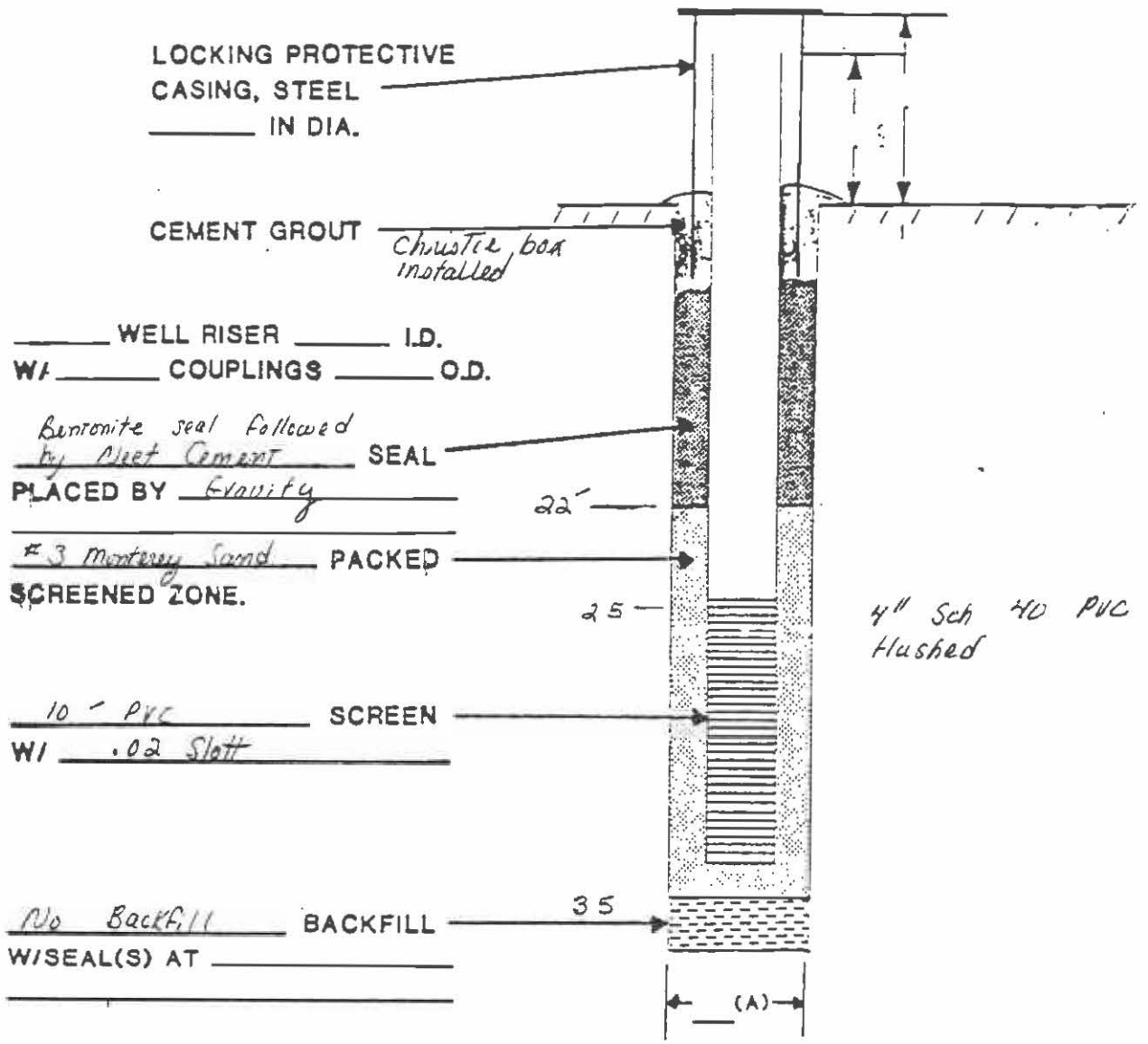
DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION At approximately a 45 feet depth, and around 4:00 it thundered, lighting struck and it poured rain. We waited until the rain ceased to complete the borehole. However, because of surface runoff from the rain into the borehole we took no more soil samples. We went directly to 57 feet below the surface and collected water samples.

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	n	
2. Well Installation Details	y	n	
3. Water Level Observation	y	n	
4. Conversation Memo(s)	y	n	
5. Log Book	(y)	n	

REPORT PREPARED BY Barbara Fontes DATE 10/2/86

MONITORING WELL INSTALLATION RECORD MW - 02



	DATE/TIME
COMPLETE BORING	10/3/86
BEGIN WELL INST	10/3/86
FINISH WELL INST.	10/3/86
BEGIN WELL DEV.	11/14/86 - 9:20
END WELL DEV.	11/14/86 - 10:15

1 HRS. DEVELOPMENT

____ HRS. _____

____ HRS. _____

NOTES Groundwater brown & silty. Groundwater never cleared.

REPORT PREPARED BY: BF

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0002 DATE 10/3/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hall

RIG USED B-53 (8" augers & 4" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 10:00 AM END TIME 3:30 pm

PROTECTION LEVEL B C (D)

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Completed collecting soil and water samples from borehole BH-02 located at 700 North Vignes Street. Completed the installation of monitoring well BH-02 to a depth of 35 feet. Groundwater is at approximately 30 feet. A 10 foot PVC screen was installed allowing 5 feet of the screen above the water table. Cutting, wash water, decontamination water are stored on site in 55-gallon capacity drums with lids.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION 10" Hollow stem augers had to be used because of the 4" PVC Casing. Because of the large diameter hole caused by the auger, and because another borehole (BH-01) had been completed apx. 15' from BH-02, the borehole BH-02 was sampled to a depth of 35 feet.

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	(y)	n	page 19 of log book
3. Water Level Observation	(y)	n	30 feet
4. Conversation Memo(s)	y	(n)	
5. Log Book	(y)	n	page 19

REPORT PREPARED BY Barbara Fontes DATE 10/3/86

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. B7-600-0002 DATE 10/8/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6 " augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 AM END TIME 3:15 pm

PROTECTION LEVEL B C D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Borehole BH-08, adjacent to Dennys Restaurant and Howard Street, was completed to a depth of 45 feet. The following samples were collected: 1) 9 soil samples and 2) a (one) water sample. Groundwater (sample) was ~~encountered~~ Collected at 43.5 feet. BF (10/13/86) The water sample, BH-08-30 and BH-08-45 were all delivered to the laboratory for analysis. BH-08-30 consist of a black colored oily substance. BH-08-45 had an elevated OVA reading of 2.5 ppm. However, BH-08-40 had elevated OVA reading of 4.8 ppm. BH-08-45 was choosen for lab analysis to determine if the above elevated reading is not below 40 feet. (Groundwater was encountered at apx. 30 feet)

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Cobbles encountered in borehole BH-08 broke the teeth on the drill bit, and the sampler was lost downhole. The sampler was retrieved with the sample intact. Drill-Line has another drill bit coming out to the site in the morning (Thursday - 9th)

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	y	(n)	
3. Water Level Observation	(y)	n	~~43.5 feet~~ 30 feet BA 10/13/86
4. Conversation Memo(s)	(y)	(n)	
5. Log Book	(y)	n	page 23 of log book

REPORT PREPARED BY Barbara Fortes DATE 10/8/86

Photos

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0002 DATE 10/9/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 AM END TIME 3:15pm

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Bore Hole BH-08 was completed to 60 feet. Soil samples were taken at 55 and 60 feet depths, and water samples were taken at completion depth. BH-08 was then filled, cemented to surface. Samples had elevated OVA readings and (hydrocarbon?) odor.

Borehole BH-07 was then attempted. On the first attempt, concrete was encountered at 7 feet depth, after passing through brick. The Borehole was then attempted approximately 2 feet closer to the fence. Concrete(?) was encountered at about 3 feet. The drill rig was moved about 7 feet north, to avoid pipes (as indicated on mars). Steel pipes were encountered at about 5 feet depth. Holes were plugged and site abandoned. All equipment was steam cleaned.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Problems with sightseers, even after area had been cordoned off. We would ask people not to stay too close. Prior to starting BH-07, a larger area was cordoned off.

Drilling at BH-07 appeared very difficult to impossible. If we could avoid the probable concrete pad foundations, we would encounter pipes. It was therefore deemed best to abandon that location.

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	y	(n)	
3. Water Level Observation	(y)	n	at apx. 30 feet
4. Conversation Memo(s)	y	(n)	
5. Log Book	(y)	n	page 24

REPORT PREPARED BY Allison Uhlorn DATE 10/9/86

DAILY ACTIVITY REPORT

SITE Metro Rail Transit Borehole Sites PROJECT NO. 87-600-0008 DATE 10/10/86

DRILLING CONTRACTOR Drill Line DRILLER Greg Deluca

HELPER John Hale

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 9:00 AM END TIME 1:30 pm

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Completed BH-11, adjacent to center street, to approximately 40' below the surface. At apx. 25 ft. below the surface a tar-like substance was encountered. OVA readings in the hole at 25 feet was recorded at 150 ppm. EXPL. in the hole at 25 feet was 2%. Headspace value of the soil sample was off scale on the 1X, 10X, and 100X scales. The area had a strong order.

BH-11 Was backfilled with cuttings removed from the borehole. This was done so that we can go back into the hole and complete sample collection to a depth 60 feet below the surface

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Drillers have been having problems with the rig hammer all morning. Once the hammer wire line ~~was~~ unwound and than the hammer was lost and retrieved (by removing the augers). It was evident that soil or water samples could not be collected without the use of the hammer. The site was closed at 1:30 pm

NOTE: Plan to install monitoring well in ~~BH-01~~ BH-11 (OF)

ATTACHMENTS

1.	Boring Log(s)	(y)	n
	Gamma Log(s)	y	(n)
2.	Well Installation Details	y	(n)
3.	Water Level Observation	y	n
4.	Conversation Memo(s)	(y)	n
5.	Log Book	(y)	n

29 feet below the surface

REPORT PREPARED BY Barbara Fontes DATE 10/11/86

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 10/13/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 11:30 am END TIME 4:30

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED At borehole BH-12 (near the old Center Street) a concrete slab was encountered approximately 6" beneath the surface. Further evaluation of the area indicates that the slab is part of the gasification/butadine plant and may be 12 feet thick.

The fence adjacent to BH-07 (Howard Street) is down. It appears that someone parked at Dempsy backed up into the fence. Earth Tech is not responsible. We left the area in the condition it was in when we left.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION The rigs drop hammer was not falling correctly and it was supposed to have been fixed over the weekend (10/11-12/86). It was obvious that the drillers were trying to fix the problem on site. I requested that the rig be taken to their yard to be fixed.

ATTACHMENTS

1.	Boring Log(s)	y (n)	
	Gamma Log(s)	y (n)	
2.	Well Installation Details	y (n)	
3.	Water Level Observation	y (n)	
4.	Conversation Memo(s)	y (n)	
5.	Log Book	(y) n	page 27

REPORT PREPARED BY Barbara Fortin DATE 10/14/86

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 10/14/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:13 am END TIME 8:30 pm

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Borehole BH-11 was extended to a depth of 60 feet (from 45 feet already completed) below the surface. Additional soil samples were not collected because: 1) the hole was previously backfilled with the soil that was originally removed from the borehole, 2) to obtain a samples that wasn't cross contaminated the sample would have to be obtained from at less 55 feet 2) the hammer (140 lb) broke and the augers had to be removed to retrieve the hammer. The augers were advanced again to a 60 foot depth. The A rods were used to push out the plug in the lead auger.

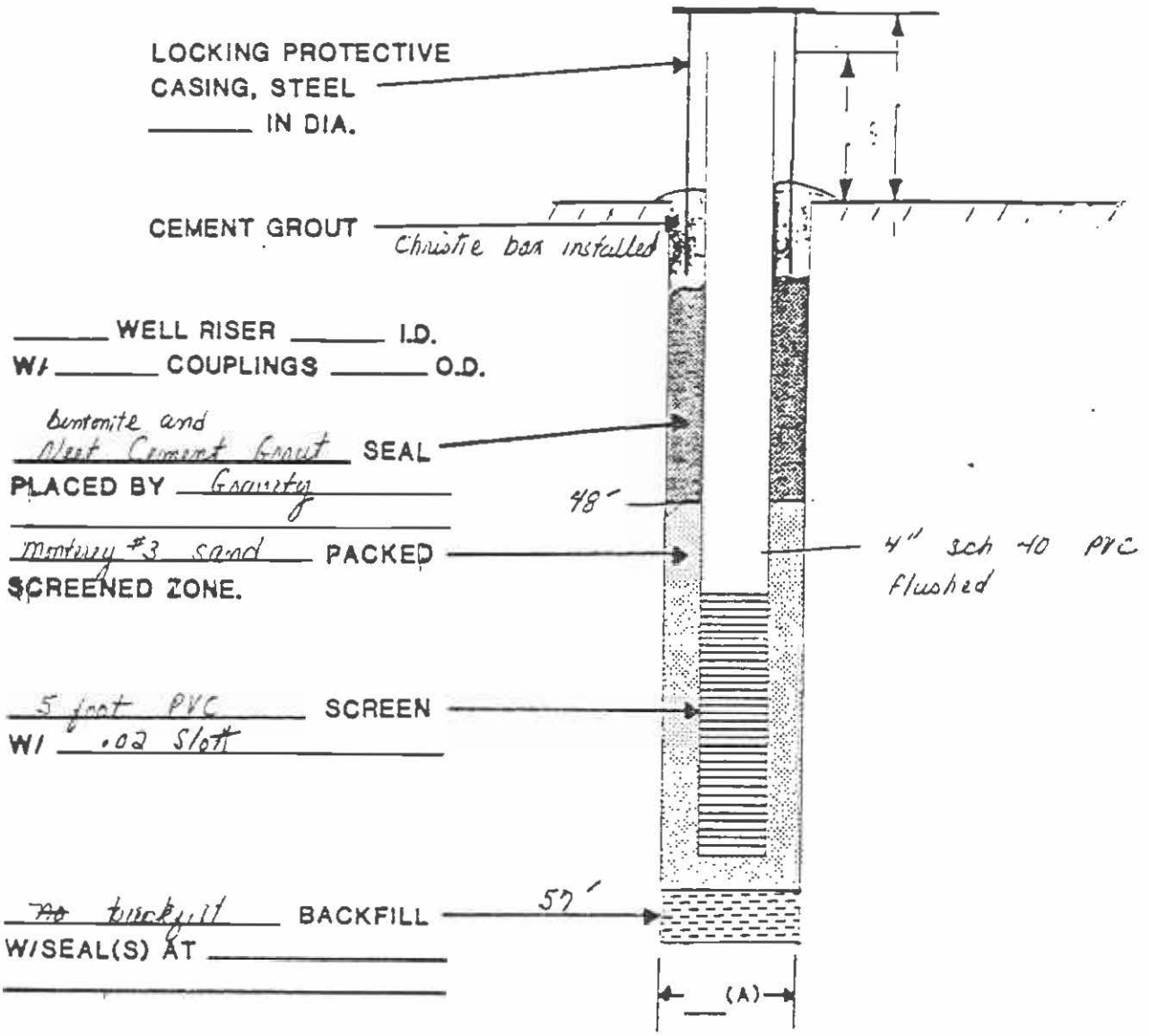
DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Borehole BH-12 and BH-13 both have concrete 6" below the surface. With the help of Mr. Williams (PBCD) an alternate site was selected for BH-12. Earth Tech plans to hand auger the newly selected and the remaining borehole locations to see if they are accessible below 5 feet.

ATTACHMENTS

1. Boring Log(s) — (y) n — BH-11
   Gamma Log(s) — y (n)
2. Well Installation Details — (y) n — ~~BH-11~~ (BA)
3. Water Level Observation — (y) n — appx. 29.5 feet
4. Conversation Memo(s) — y (n)
5. Log Book — (y) n — page 29

REPORT PREPARED BY Barbara Foster DATE 10/15/86

MONITORING WELL INSTALLATION RECORD MW - 22



	DATE/TIME
COMPLETE BORING	10/15/86
BEGIN WELL INST	10/15/86
FINISH WELL INST.	10/15/86
BEGIN WELL DEV.	11/14/86 10:30 am
END WELL DEV.	11/14/86 11:40
1 HRS. DEVELOPMENT	
____ HRS. ____	
____ HRS. ____	

NOTES Groundwater orange in color and cleared after 30 gallons was bailed. PVC is schedule 40 and 4" in dia. Joints are flushed

REPORT PREPARED BY: B.A. Fontes

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 10/15/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 10:00 am END TIME 5:30 pm

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD (EXPL)

DESCRIPTION OF WORK PERFORMED Installation of monitoring well BH-11 (corner of Ramirez St. and Center Street) has been completed. The borehole was completed to a depth 60 feet below the surface. Upon removal of the plug in the lead auger sand heaved into the augers and could not be removed. The monitoring well was installed at approximately 57 feet, and sand continued to heave in. #3 Monterey Sand was poured around the five foot screened area and it is assumed it mixed with the up heaving natural sand. The borehole was completed with a bentonite seal 5' above the screened area followed by a cement slurry to the surface. All drilling & downhole equipment was decontaminated before leaving the site.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Because the drillers had to remove the augers from this borehole twice no soil samples were collected after the first drilling activities - to a depth of apx. 40 feet below surface. Water samples will be obtained after the well has been developed. The drillers had the wrong size Christie box cover. They were told to bring out the correct cover in the morning and to temporary cover the monitoring well.

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	(y)	n	
3. Water Level Observation	(y)	n	apx. 30 feet below surface
4. Conversation Memo(s)	y	(n)	
5. Log Book	(y)	n	pages 29

REPORT PREPARED BY Barbara Fontes DATE

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 10-16-86

DRILLING CONTRACTOR ~~DRILL LINE~~ DRILLER ~~GREG DEUCH~~ ALLISON URBON

HELPER JOHN ~~HALE~~ SKALBECK

RIG USED ~~B-53 (6" auger & 7" drill bit)~~ Gasoline-powered 2-man hand auger CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:50 AM END TIME 10:32 AM

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 OVA RAD EXPL

DESCRIPTION OF WORK PERFORMED

Attempts were made to auger to five feet at locations for proposed BH-12 and BH-13. Depths of just over one foot depth were attained at each location without encountering cement. No cement was encountered in BH-13 about 3 feet north of the original site, which may indicate a possible location for BH-13.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION The auger used was not adequate to penetrate through the highly compacted, cobbly soil at the surface. We quit the site. Adequacy of the CPT (for use at this site) is being studied.

ATTACHMENTS

1.	Boring Log(s)	y (n)	
	Gamma Log(s)	y (n)	
2.	Well Installation Details	y (n)	
3.	Water Level Observation	y (n)	
4.	Conversation Memo(s)	y (n)	
5.	Log Book	(y) n	page 31

REPORT PREPARED BY ALLISON T. URBON DATE 10-17-86

The Earth Technology Corporation

RECORD OF ACTIVITIES AT DRILL SITE

DATE 10-28-86

LOCATION Metro Rail

PROJECT NUMBER 86-600-01

HYDROGEOLOGIST John SKALBECK

SITE TYPE / SITE ID

WELL OR BORE	N
	S

Starting Miles 847.5

7:30 Started to mobilize, had problems starting Arizona Truck, used the "Dog" instead

8:05 Left Annex, stopped at Texaco to gas up

8:15 arrived on site, met John Hale

8:20 Set up drill rig at well # 2 (BH-02) BH

Drill rig is Mobile B-53, Told John to wear tyvek & rubber gloves

9:35 Retrieved two 55-gallon drums to empty bailed water into

9:40 Left site to call Barbara F. Barbara stated that water is to be placed into drums then pumped into the Baker Tank

9:50 Back on site Approx casing vol 8'(.66) ≈ 5.5 gal.

10:00 Greg arrived, helped John with bailer

Had to modify bailer to get a proper seal

10:27 Bailer finally working properly. Bailed approx. 20 gallons of silty water, water clarity remained the same

10:51 Set up air-surge pump, pumped only a trace of water. Greg stated he had never used pump before this date

11:15 Greg disassembled pump to resolve slow pumping problem. Place pump back down well. Pump again only a trace of water. We could not generate enough pressure to lift water into the drum

11:41 Removed pump from well. Resumed bailing

12:15 Finished bailing, Total 55 gallons bailed, Lost 10 gallons water (Clear)

F 25 7

The Earth Technology Corporation

RECORD OF ACTIVITIES AT DRILL SITE

DATE 10-28-86

LOCATION Metro Rail

PROJECT NUMBER 86-600-01

HYDROGEOLOGIST John Skalbeck

SITE TYPE	SITE ID
WELL OR BORE	N
	S

Greg made a phone call to his office
He said he needed a larger compressor.

1:05 Greg left site to pick up a compressor in Santa Fe Springs

2:35 Moved to Well # 1 (CBH-11)

02 Ready to bail Casing Volume Approx.
$(57-30)(.65) = (27)(\frac{2}{3}) = 18$ gal.

1:15 Greg returned from PDQ (Santa Fe) with compressor
15 minute lunch break

1:30 Resumed bailing, bailed 55 gals

1:50 Switch operation to air-surge pump
air-surged 110 gallons water, last 30 gallons clear
Oil-gas sheen on water surface
Multicolor streaks

2:20 Finished development of well #1

2:25 Went to Denny's to call Barbara
Barbara stated that the contents of the drums must be pumped into the Baker Tank
She also said I should not stay to supervise

2:35 Left Site

3:30 Arrive at Annex Ending miles 895.6
Equipment used: 2 yellow poly-coat tyvek
3 pair Rubber gloves
Log Book - pg 35 John Skalbeck

F 25 1

SUMMARY OF DRILLING ACTIVITIES - METRO RAIL

DATE	BOREHOLE ID	COMPLETION DEPTH (FT)	DRILL TIME (HRS.)	COMPLETION TIME (HRS.)	OBSTRUCTIONS	DECON TIME (HRS.)	SAMPLES OBTAINED	ADDITIONAL DOWN TIME
9/25	BH-06	0-55	3.5	3.0	None	1.5	9	Lost 4 hrs. to Spectrum - Clearing drilling area.
9/26	BH-05	0-03	0.5	--	Rebar	0.5	0	
	BH-05	0-07	1.0	--	Concrete	0.5	1	
	BH-06A	0-35	3.0	3.5	None	1.0	8	
9/29	BH-08A	0-10	1.0	--	None	1.0	1	Lost the rest of the day due to monitoring equip. breakdown.
10/1	BH-08B	0-03	0.5	--	Rebar	0.5	0	
	BH-08C	0-04	0.5	--	Rebar	0.5	0	
	BH-08A	0-15	1.5	1.5	Tank??	2.0	3	
	BH-07A	0-02	0.5	--	Concrete	0.5	0	
	BH-07B	0-02	0.5	--	Concrete	0.5	0	
	BH-09A, BH-09B, BH-09C	0-04	2.0	--	Concrete	0.5	0	
10/2	BH-01	0-45	2.5	2.0	None	1.5	8	Approximately 3 hrs. Standby due to rain.
	BH-04	0-57	4.0	3.0	None	1.0	8	
10/3	*BH-02	0-35	2.5	2.0	None	1.0	8	
10/8	BH-08D	0-50	4.0	2.5	None	2.0	10	Lost 1 hr. due to losing sampler to 45 feet.
10/9	BH-08D	50-60	1.0	2.0	None	2.0	--	
	BH-07C	0-07			Concrete	0.5	1	
	BH-07D	0-03	2.0	---	Pipe	0.5	--	
	BH-07E	0-04			Pipes	0.5	--	
10/10	BH-11	0-45	1.5	--	None	1.0	5	Lost 1 hr. Hoist broke.
10/13	BH-12	01	0.2	--	Concrete	0.5	--	Shutdown due to hoist line.
10/14	*BH-11	0-60	1.5	--	None	1.5	--	Hammer problems - resulting in breakage. Lost 2 - 3 hrs.
10/15	BH-11	--	--	3.0	--	1.0	--	

* Monitoring Well Installed

The Earth Technology Corporation

WATER QUALITY SAMPLING

PROJECT NAME MRTC WELL NO. BH-02 / BH-11 GROUND SURFACE ELEVATION

PROJECT NO. 87-600-02 INSTRUMENT TYPE Bailer TOP CASING ELEVATION

ORDER OF SAMPLING RECORDED BY R. Thomasser

DATE	TIME	TAPE READING AT MEASURING POINT	TAPE READING AT WATER MARK	DEPTH TO WATER	DEPTH TO BOTTOM	Gallons Bailed	SPECIFIC CONDUCTIVITY (µMHOS)	TEMPERATURE °C	PH	OVA	REMARKS
11/14/86	9:20	27.0'	- 1.27' =	25.73'							
"						2	1100	35	5.3	-	Brown/silty
"						4	1100	38	5.5	-	"
"						8	1020	38	5.6	-	"
"						12	1030	38	5.8	-	"
"						14	1030	38	5.9	-	"
"						21	1025	38	5.8	-	"
"						25	1025	38	5.8	-	"
"	10:15								Sample		
11/14/86	10:30	25.0'	- 1.41'	= 23.59		4	1400	40	5.9	-	Orange/cloudy
						8	1390	40.5	5.8	-	"
						12	1390	40	5.9	-	"
						16	1400	40	5.9	-	Orange/clear
						20	1400	40	5.8	-	clearer
						25	1400	40	5.9	-	clear
						30	1400	40	5.9	-	clear
	11:40								Sample		

BH-02

BH-11

H-05 1-80

cc: Barker
Fontes

DAILY ACTIVITY REPORT

SITE MRTC PROJECT NO. 87600-02 DATE 11/14/86

DRILLING CONTRACTOR none DRILLER none

HELPER

RIG USED CASING USED SAMPLERS USED

START TIME 9:00 END TIME 12:00 (on site)

PROTECTION LEVEL B (C ↔ D)

MONITORING EQUIPMENT HNU 11.7 10.2 OVA RAD EXPL

DESCRIPTION OF WORK PERFORMED Sampled wells BH-02 & BH-11
(See attached WQ Sampling form)
Took samples for ✓ EPA 624
✓ EPA 625
✓ TPHC 418.1
✓ pH

Took a "dummy" sample from BH-11 and called it BH-15. Also sent a field blank in for analysis. All water bailed was placed in baker tank on site.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION

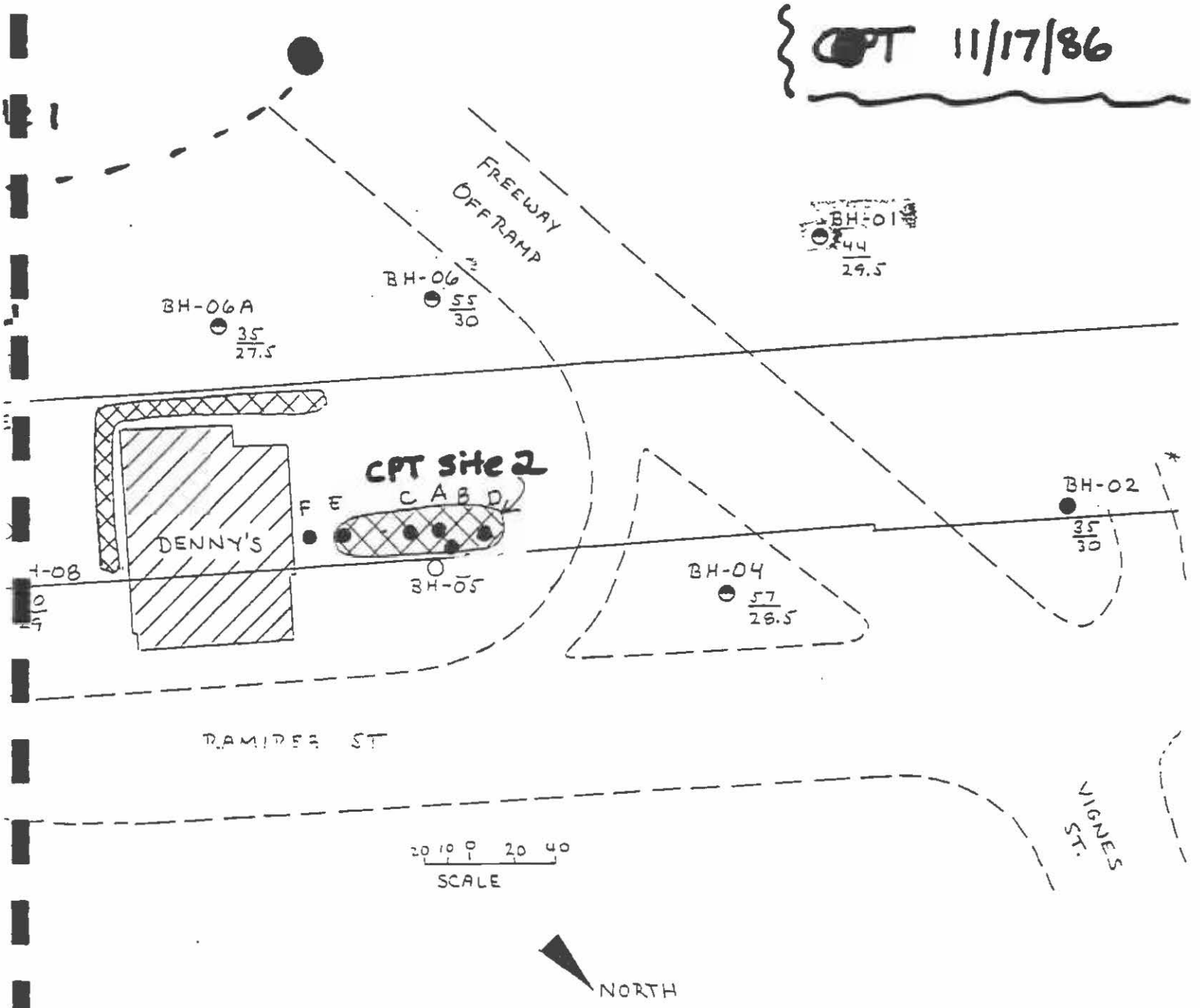
ATTACHMENTS

1. Boring Log(s)	y	n	
Gamma Log(s)	y	n	
2. Well Installation Details	y	n	
(3.) Water Level Observation	(y)	n	WQ Sampling form
4. Conversation Memo(s)	y	(n)	

REPORT PREPARED BY R. Thomasser DATE 11/14/86

Pg. 37 (Log BK)

CPT 11/17/86



$\frac{60}{29}$ = $\frac{\text{Borehole Completion Depth}}{\text{Groundwater Depth}}$

* Halted Before Hitting Groundwater

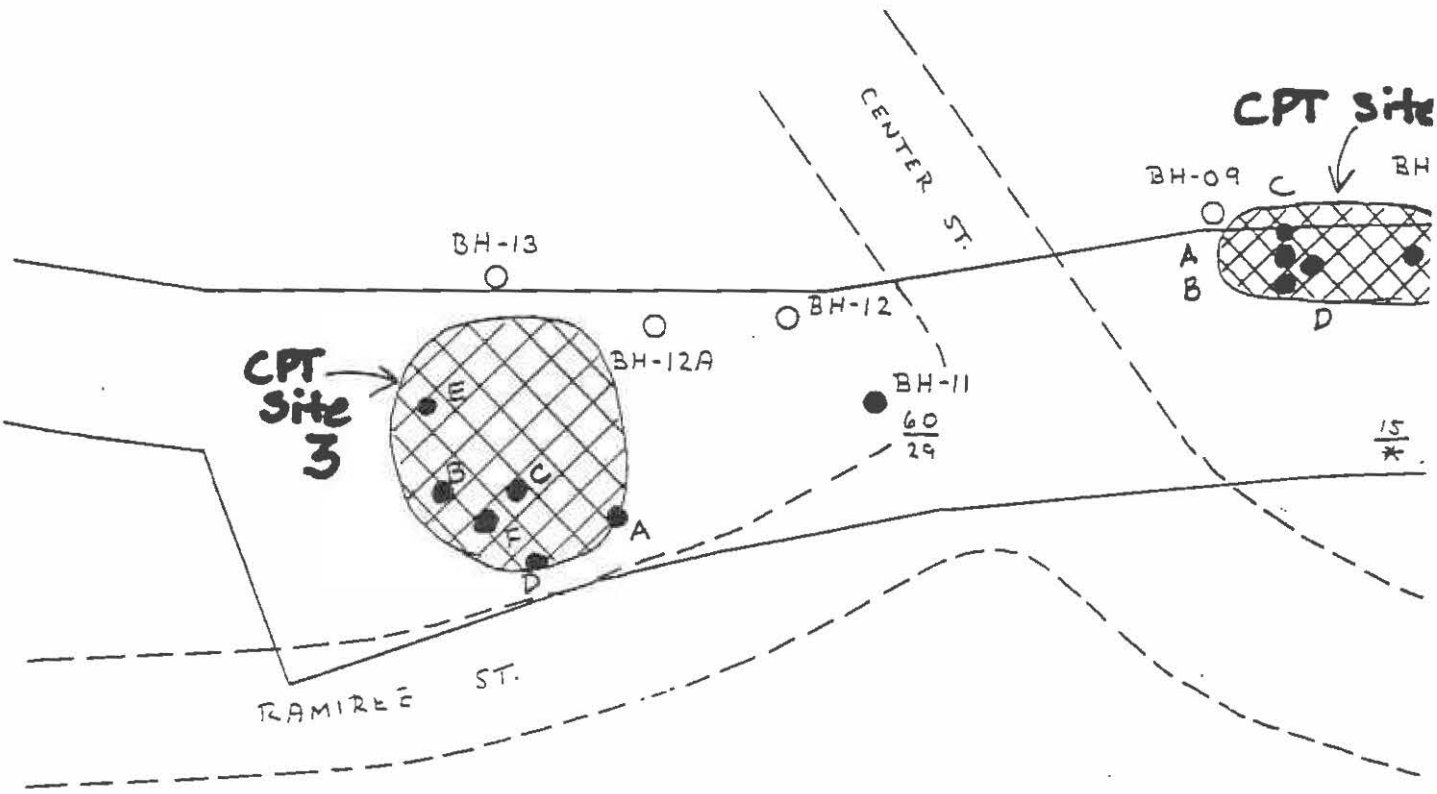
● Completed Monitoring Well

◓ Completed Borehole

○ Unsuccessful Locations

▲ Tank or Sump

87-600



LAB DATA INDICATES
SOILS ARE:

CONTAMINATED

CLEAN

GENERAL FOR CPT PROBING

● A CPT # A

METRO RAIL PROJECT AREA

Summary of CPT Probings 11/17/86

CPT Area 1	CPT 1A	Refusal at 8.46'
	CPT 1B	Refusal at 15.35'
	CPT 1C	Refusal at 32.00' hard to push (>2000 PSI) at 15'-18'.
CPT Area 2	CPT 2A	Refusal at 1.50'
	CPT 2B	Refusal at 2.51'
	CPT 2C	Refusal at 19.28'
	CPT 2D	Refusal at 1.60'
	CPT 2E	Refusal at 27.87' hard to push at 15-19'.
	CPT 2F	Refusal at 19.38'
CPT Area 3	CPT 3A	Refusal at 1.19'
	CPT 3B	Refusal at 0.56'
	CPT 3C	Refusal at 11.15'
	CPT 3D	Refusal at 18.70'
	CPT 3E	Refusal at 5.53'
	CPT 3F	Refusal at 21.31'
CPT Area 4	CPT 4A	Refusal at 30.00' bad crunches at 4.5 feet.
	CPT 4B	Refusal at 17.44'
	CPT 4C	Refusal at 25.76'
	CPT 4D	Refusal at 17.41'
	CPT 4E	Refusal at 8.10'

Signature Richard Romasser Date 11/17/86

DAILY ACTIVITY REPORT

SITE Metro Rail Transit PROJECT NO. 87-600-02 ~~27~~ DATE 11/17/86

~~DRILLING CONTRACTOR~~ CPT- Earth Tech. ~~DRILLER~~ Rick Thomasser, TETC, Gerry Boehm, ~~HELPER~~ TETC, Mark Roberts TETC

RIG USED TETC Cone Penetrometer ~~CASING USED~~ _____ ~~SAMPLERS USED~~ _____

START TIME 8:00 END TIME 4:30

PROTECTION LEVEL B (C ↔ D) C - during decon and grouting

MONITORING EQUIPMENT (HNU) 11.7 (10.2) OVA RAD EXPL

DESCRIPTION OF WORK PERFORMED

Probed with the cone penetrometer in areas described on following pages.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION Advised Larry Barker and Barbara Fontes to hold off on drilling program set for 11/18/86 until at least 11/19/86, due to inability to locate suitable drilling locations with the CPT.

ATTACHMENTS

1.	Boring Log(s)	y n	
	Gamma Log(s)	y n	
2.	Well Installation Details	y n	
3.	Water Level Observation	y n	
4.	Conversation Memo(s)	y n	

REPORT PREPARED BY R. Thomasser DATE 11/17/86

pg 41 of log book

Summary of CPT Probings 11/18/86

TIME

CPT Site 3

3G	3.63'	3K	0.64'	3O	20.09'
3H	0.49'	3L	0.93'	3Q	3.83'
3I	1.54'	3M	0.52'	3X	0.87'
3J	0.74'	3N	1.73'		

CPT Site 4

~~3F~~ 4F	20.80'	4J	17.00'
4G	4.10'	4K	3.20'
4A	21.00'	4L	17.70'
4I	14.70'		

CPT Site 5

5A	3.40'	5E	14.90'
5B	4.80'	5F	18.00'
5C	18.10'	5G	22.90'
5D	1.00'	5H	16.40'

Signature Richard [signature] Date Nov. 20, 1986

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT PROJECT NO. 87-600-0021 DATE 11/18/86

CONTRACTOR: EARTH TECH. GEOPHYSICS ~~DRILLER~~ Rick Thomasser TETC

~~HELPER~~ Gerry Boehm, TETC, Mark Roberts TETC

RIG USED TETC CPT CASING USED _____ SAMPLERS USED _____

START TIME 8:00 am END TIME 5:00 pm

PROTECTION LEVEL B (C) ⟷ (D) C - during grouting, pulling rods and decon

MONITORING EQUIPMENT (HNU) 11.7 (10.2) OVA RAD EXPL

DESCRIPTION OF WORK PERFORMED

Probed with the Cone ~~Pentero~~ Penetrometer in Areas described on following page.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION

ATTACHMENTS

1. Boring Log(s) y (n)
   Gamma Log(s) y (n)
2. Well Installation Details y (n)
3. Water Level Observation y (n)
4. Conversation Memo(s) y (n)

REPORT PREPARED BY R. Thomasser DATE 11/20/86

pg 41 y log book

Summary of CPT Probing 11/19/86

TIME

CPT Site 1

1D 13.60'
1E 12.20'
1F 20.10'

CPT Site 6

6A 18.60'
6B 22.60'

CPT Site 7

7A 34.99'
7B 25.61'
7C 16.00'
7D 25.34'

Signature [signature]

Date Nov. 20 1986

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT PROJECT NO. 87-600-0021 DATE 11/19/86

CONTRACTOR: EARTH TECH. GEOPHYSICS ~~DRILLER~~ Rick Thomasser TETC

HELPER Geery Boehm, Mark Roberts, TETC

RIG USED TETC CPT CASING USED _____ SAMPLERS USED _____

START TIME 8:00 am END TIME 4:30 pm

PROTECTION LEVEL B (C) ⟷ (D) C during grouting, pulling rods and decon

MONITORING EQUIPMENT (~~HNU~~) 11.7 10.2 (OVA) RAD EXPL

DESCRIPTION OF WORK PERFORMED

Probed with the cone penetrometer in areas described on following page.

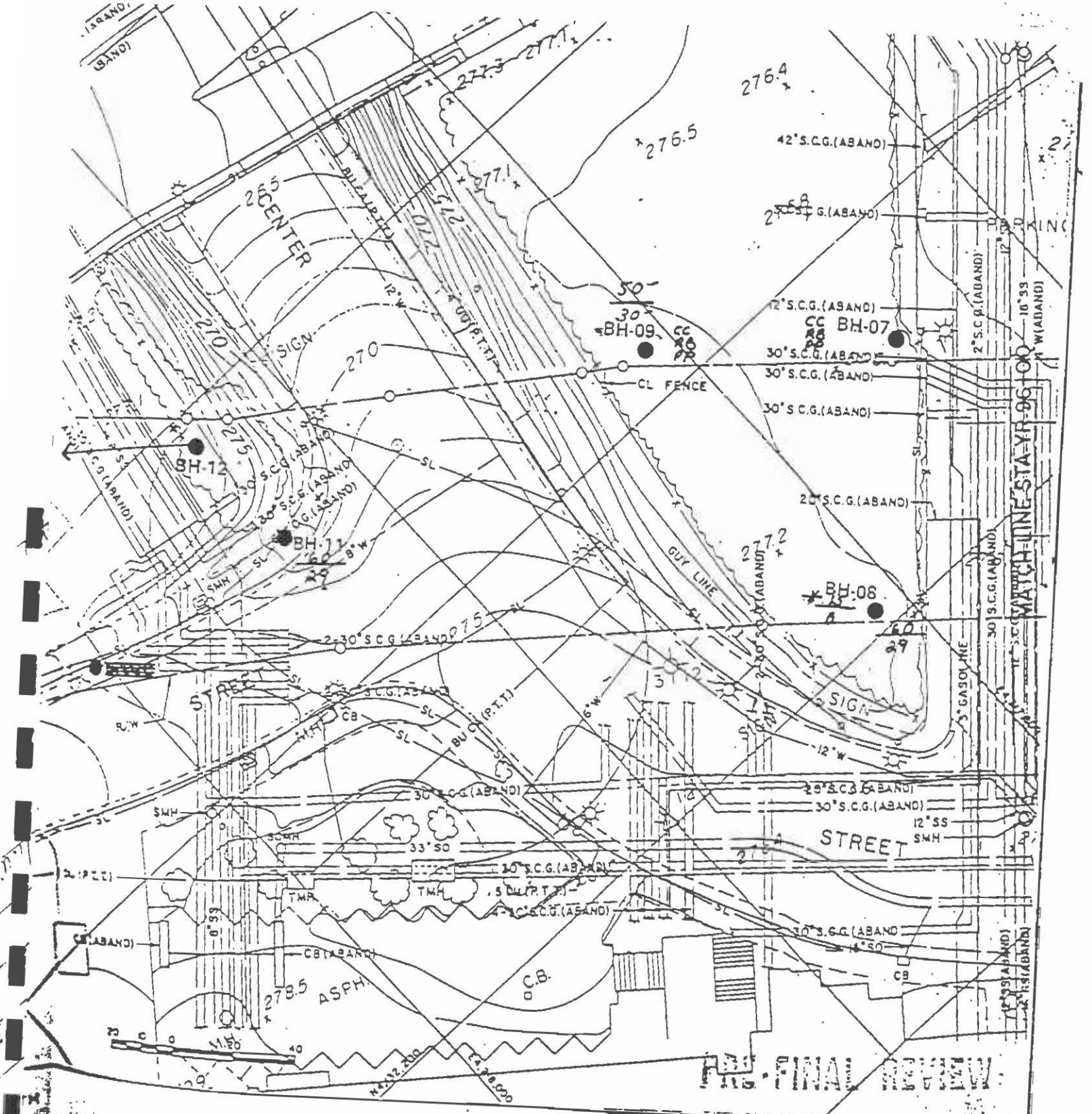
DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION

ATTACHMENTS

1. Boring Log(s) y (n)
   Gamma Log(s) y (n)
2. Well Installation Details y (n)
3. Water Level Observation y (n)
4. Conversation Memo(s) y (n)

REPORT PREPARED BY R. Thomasser DATE 11/20/86

Pg 41 of Log Book



EXPLANATION

BH-10 ● LOCATION OF BOREHOLE

The Earth Technology Corporation

PROJECT NO.: 87-600-1001

METRO RAIL TRANSIT

BOREHOLE LOCATION PLAN

9-86

FIG

TIME	
8:00 AM – 10:00 AM	Two hours standby for drillers. Earth Tech PM directing the day's activities
10:30–38	Bomi Ghadiali visited the site and picked up copies of lab. results. I informed Mr. Bomi that Larry Barker now has control of the project files and all request for documents must go through him.

ATTachment – Activity Report for CPT Project

Signature Barbara Fontes Date 11/19/86

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 11/19/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 END TIME 4:30

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD EXPL

DESCRIPTION OF WORK PERFORMED Completed borehole BH-09 (adjacent to Center Street in the fenced area) to a depth of 50 feet. Groundwater was encountered at 30 feet.

Soils encountered at 25 ft, 30 ft and 35 ft were blackish in color and contained a oily substance. The oily substance had a rainbow sheen.

Water sample was collected at 50 feet and rainbow sheen was evident in the sample. Samples to be analyzed for EPA 625, 624, 418.1, TPHC, PH + Sulfides

~~DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION~~

Soil samples BH-09-30 and BH-09-50 were sent to the lab for the following analysis EPA 418.1, 8240 and PH.

Water samples were sent for the following analysis EPA 625, TPHC, 418.8, PH, EPA 629

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	y	(n)	
3. Water Level Observation	(y)	n	30 feet
4. Conversation Memo(s)	y	(n)	
5. Log Book	(y)	n	photos + pg 41

REPORT PREPARED BY Barbara Fontes DATE 11/19/86

cc: Larry Barkow
Joe Kulikowski

Summary of CPT Probing 11/20/86

TIME		
	CPT Site 3	
3	F2	24.65'
3	F3	31.62'
3	Z	8.74'
	CPT Site 6	
6	C	27.93'
	CPT Site 2	
2	6	17.63'
2	4	18.04'

Signature _____ Date _____

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT PROJECT NO. 87-600-0021 DATE 11/20/86

CONTRACTOR: EARTH TECH. GEOPHYSICS ~~DRILLER~~ Rick Thomasser TETC

~~HELPER~~ ~~Gerry Bodnar, TETC~~, Mark Roberts TETC (RT)

RIG USED TETC CPT CASING USED _____ SAMPLERS USED _____

START TIME 8:00 am END TIME 3:30 pm

PROTECTION LEVEL B (C ↔ D) C during decon, grouting & pulling rods

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD EXPL

DESCRIPTION OF WORK PERFORMED

Probed with the cone penetrometer in areas described on following pages.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION

ATTACHMENTS

1. Boring Log(s) y (n)
   Gamma Log(s) y (n)
2. Well Installation Details y (n)
3. Water Level Observation y (n)
4. Conversation Memo(s) y (n)

REPORT PREPARED BY R. Thomasser DATE 11/21/86

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 11/20/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 END TIME 4:00 (p.m.)

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD EXPL

DESCRIPTION OF WORK PERFORMED Completed boring BH-07 to a depth of 45 feet. Groundwater encountered at approximately 29.5 ft. A clear oily substance was in the soil sample collected at 30 feet. OVA reading recorded at 30 feet was 4ppm. OVA readings for all other samples were at background levels of 2 ppm.

Soil Sample BH-07-30
Water Samples BH-07-50
} collected for laboratory analysis correction made 12/17/86. Changed BH-07 to BH-07. B. Fontes

CPT activity report attached

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION None

ATTACHMENTS

1. Boring Log(s) — (y) n
   Gamma Log(s) — y (n)
2. Well Installation Details — y (n)
3. Water Level Observation — (y) n — 29.5 feet
4. Conversation Memo(s) — y (n)
5. Log Book — (y) n — pg 41

REPORT PREPARED BY Barbara Fontes DATE 11/20/86

cc: Joe Kulikowski
Larry Barker

CPT Site 4 (SW of Denny's Lot)

4A	30.00' (4.5'-crunching)
4B	17.44'
4C	25.76'
4D	17.41'
4E	8.10'
4F	20.80'
4G	4.10'
4H	21.00'
4I	14.70'
4J	17.00'
4K	3.20'
4L	17.70'

CPT Site 5 (Denny's Corner)

5A	3.40'
5B	4.80'
5C	18.10'
5D	1.00'
5E	14.90'
5F	18.00'
5G	22.90'
5H	16.40'

11/21/86

Final Summary of CPT Probings

Four Hole Program (48 probings)

CPT Site 2 (Denny's Parking lot NE)

2Q	1.50'	
2B	2.51'	
2C	19.28'	
2D	1.60'	
2E	27.87'	(hard 15'-19')
2F	19.38'	
2G	17.63'	
2H	18.04'	(hard 10'-18')

CPT Site 3 ("Pit Area" Carter & Ramirez)

3Q	1.9'	
3B	0.56'	
3C	11.15'	
3D	18.70'	
3E	5.53	
3F	21.31'	
3F2	24.65'	(16-17' "crunching")
3F3	31.62'	(15-17' hard, 19' crunching)
3G	3.63'	
3H	0.49'	
3I	1.54'	
3J	0.74'	
3K	0.64'	
3L	0.93'	
3M	0.52'	
3N	1.73'	
3O	20.09'	
3Q	3.83'	
3X	0.87	
3Z	8.74'	

Org: Fontes
cc: Barker
Urban
Kulikowski
Thomasser
Phung
Brown

TIME	
9:10 ↓	Sample no. 1 collected
9:45	Sample No. 6 - 30 feet Gray black find - med. size grain quartz sand. Sand is well sorted. Soil contains tar like substance that has a sheen. The substances stains everything brown. OVA = .4
10:00	Sample No. 7 - 35 feet Same as above. The water and soil has contain the tar like substance and sheen. OVA = 800 ppm
10:18	Sample no. 8 at 40 feet Same as above
10:35	Water Sample Temp 25.2°C pH = 6.82 σ = 1450 µmHOS Oil sheen

Signature Barbara Fontes Date 11/21/06

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 11/21/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 8:00 END TIME 1:30 apx

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD EXPL

DESCRIPTION OF WORK PERFORMED Completed borehole BH-10 (Ramsey St. Near excavated Cal Trans pit) to a depth of 55 feet. A blackish oily + tar like substance appeared in soil samples collected from 30 feet, 35 feet, and, 40 feet. OVA reading for the soil sample collected at 35 feet was recorded at 800 ppm. The sampler from 35 feet to 45 feet was covered with an oily substance that had a rainbown sheen to it. From 40 to 45 feet OVA readings down the borehole were recorded at 600 ppm and 350 ppm.
(Lab Sample – 35' ; Water Sample – 55')

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION At 45 feet sand began to heave into the sampler and there exist the possibility of the sampler getting stuck in the hole. The borehole was extended to 55 feet below the surface where the water sample was collected.

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	y	(n)	
3. Water Level Observation	(y)	n	34 feet
4. Conversation Memo(s)	y	(n)	
5. Log Book	(y)	n	pg 42

REPORT PREPARED BY Barbara Foster DATE 11/21/86

cc: Joe Kulikowski, Carrie Barker, Tan Phung

DAILY ACTIVITY REPORT

SITE METRO RAIL TRANSIT BOREHOLE SITES PROJECT NO. 87-600-0002 DATE 11/24/86

DRILLING CONTRACTOR DRILL-LINE DRILLER GREG DELUCA

HELPER JOHN HALE

RIG USED B-53 (6" augers & 7" drill bit) CASING USED 4" Sch. 40 PVC SAMPLERS USED Split Spoon

START TIME 9:00 END TIME 2:00

PROTECTION LEVEL B (C) D

MONITORING EQUIPMENT HNU 11.7 10.2 (OVA) RAD EXPL

DESCRIPTION OF WORK PERFORMED Completed borehole BH-05 in Denny's parking lot adjacent to the Santa Ana Freeway Entrance. The borehole was completed to a depth of 45 feet. Groundwater was encountered at approximately 25-26 feet. at 35 feet the soil contained a black oily substance with a sheen. Soil samples at 45 feet appeared to be clean of the oily substance.

DESCRIBE PROBLEMS/POTENTIAL PROBLEMS & ACTION None

ATTACHMENTS

1. Boring Log(s)	(y)	n	
Gamma Log(s)	y	(n)	
2. Well Installation Details	y	(n)	
3. Water Level Observation	(y)	n	25-26 feet
4. Conversation Memo(s)	y	(n)	
5. Log Book	(y)	n	pg 42

REPORT PREPARED BY Barbara Fontes DATE 11/24/86

c.c. Joe Kulikowski
Larry Barker
Tan Phung

METRO RAIL TRANSIT
86-600-0002
86-600-0022

BARREL INVENTORY

BH-01	3
BH-02	2
BH-03	There is no boring at this location
BH-04	2
BH-05	2
BH-06	3
BH-06A	3
BH-07	2
BH-08	3
BH-08A	1
BH-09	3
BH-10	3
BH-11	3
BH-112	3
BH-113	3
BH-114	3
BH-115	3
BH-116	3
BH-117	2
BH-118	There is no boring at this location
Trash	2
* Miss. Soils	4

* Soils are from various attempts at numerous boreholes

APPENDIX B

CHAIN OF CUSTODY FORM
AND
LABORATORY DATA SHEETS

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

- ORANGE COUNTY
- VENTURA
- SANTA MARIA
- BAKERSFIELD
- L.A. COUNTY

CHAIN OF CUSTODY RECORD

Date 11/21/86 Page 1 of 2

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 LONG BEACH BLVD.

XXXXXXXXXXXX LONG BEACH, CA XXXXXX 90807

PROJECT MANAGER Barbara Fontes

PHONE NUMBER (213) 595-6611

PROJECT NAME METRO RAIL TRANSIT 87-600-0002

SAMPLERS: (Signature) Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-10-35	Ramirez Street	11/21/86	10:00 am				X	1 Brass	EPA 8240, 8270, 418.1, pH
BH-10-35	Ramirez Street	11/21/86	10:00 am				x	1 Brass	
BH-10-45	Ramirez Street	11/21/86	10:18 am				x	1 Brass	EPA 8240, 8270, 418.8, pH
BH-10-55	Ramirez Street	11/21/86	10:35		x			1 Gal.	EPA 625, TPHC, 418.1, pH
BH-10-55	Ramirez Street	11/21/86	10:35		x			2 VOA	EPA 624, ~~TPHC, 418.1, pH~~ BF
BH-10-55	Ramirez Street	11/21/86	10:35		x			1 pint	Sulfides

Relinquished by: (Signature) Barbara Fontes	Received by: (Signature) R Bautista	Date/Time 11-24-86 4PM
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time
Method of Shipment:		

Special Instructions:

*E: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.
11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

- ORANGE COUNTY
- VENTURA
- SANTA MARIA
- BAKERSFIELD
- L.A. COUNTY

CHAIN OF CUSTODY RECORD

Date 11/24/86 Page 2 of 2

CLIENT Earth Technology Corp.
ADDRESS 3777 Long Beach Blvd.
Long Beach CA 90807

PROJECT MANAGER Barbara Fontes
PHONE NUMBER (213) 595-6611

PROJECT NAME Metro Rail Transit 87-600-0002

SAMPLERS: (Signature) Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-05-40	Denny's Parking lot	11/24/86	12:27				X	1 Brass	EPA 8240, 8270, 418.1, pH
BH-05-35	Denny's		12:24				X 1/2	Brass	EPA 8240, 8270, 418.1, pH
BH-05-45	Denny's		12:30		X			1 Gal	EPA 625, TPHC, 418.1, PH
BH-05-45	Denny's		12:30		X			1 pint	Sulfides
BH-05-45	Denny's		12:30		X			2 VOA	EPA 624
BH-05-45	Denny's		12:30				X	1 Brass	EPA 8240, 8270, 418.1, pH

Relinquished by: (Signature) Barbara Fontes 11/24/86	Received by: (Signature) E. Benitez	Date/Time 11-24-86 4 P.
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time 11-24-86 4:45 PM
Method of Shipment:		

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

- ORANGE COUNTY
- VENTURA
- SANTA MARIA
- BAKERSFIELD
- L.A. COUNTY

CHAIN OF CUSTODY RECORD

Date 11/20/86 Page 1 of 1

CLIENT Earth Technology Corporation

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER
Barbara Fontes

PHONE NUMBER
(213) 595-6611

PROJECT NAME
Metro Rail Transit 86-600-0002

SAMPLERS: (Signature)
Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	SAMPLE TYPE WATER Grab.	SAMPLE TYPE AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-07-30	Howard Street Adjacent to Dennys and	11/20/86	10:01 am				X	1	EPA 8240, 418.1, pH EPA 8270
BH-07-50	Same as above	11/20/86	11:44 am		x			1 gal.	EPA 625, TPHC, 418.1, pH
BH-07-50	Same as above	11/20/86	11:44 am					2 VOAs	EPA 624, TPHC, 418.1, pH
BH-07-50	Same as above	11/20/86	11:44 am		x			1 pint	Sulfides

Relinquished by: (Signature) 11/21/86
Barbara Fontes

Received by: (Signature)

Date/Time 11-21-86 11:00 AM

Relinquished by: (Signature)

Received by: (Signature)

Date/Time

Relinquished by: (Signature)

Received by Mobile Laboratory for field analysis: (Signature)

Date/Time

Dispatched by: (Signature)

Date/Time

Received for Laboratory by:

Date/Time 11-21-86 12:30 pm

Method of Shipment:

Special Instructions:

BH-07-30 - Recovered 1 brass liner from sampler

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

- ORANGE COUNTY
- VENTURA
- SANTA MARIA
- BAKERSFIELD
- L.A. COUNTY

CHAIN OF CUSTODY RECORD

Date 11/19/86 Page 2 of 2

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER
Barbara Fontes

PHONE NUMBER
(213) 595-6611

PROJECT NAME
METRO RAIL TRANSIT 86-600-0002

SAMPLERS: (Signature)
Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	SAMPLE TYPE WATER Grab.	SAMPLE TYPE AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-09-50	Field adjacent to Center	11/19/86			X			1 Gal.	EPA 625; TPHC 418.1; PH; H_2S
BH-09-50	Field adjacent to Center	11/19/86			X			2 VOA	EPA 624; TPHC 418.1; pH; H_2S
BH-09-30	Same as above	11/19/86					X	1 Brass	EPA 625; 8240, 418.1, pH
BH-09-30	Same as above	11/19/86					X	1 Brass	EPA 8270
BH-09-50	Same as above	11/19/86	HOT	one containing			X	1 Brass	EPA 8240, 418.1 , pH
BH-09-50	Same as above	11/19/86					X	1 Brass	EPA 8270

Relinquished by: (Signature) Jay Donnelly 11-20-86 12:20pm
Received by: (Signature) [signature] Date/Time 11/20/86 12:10PM

Relinquished by: (Signature)
Received by: (Signature) Date/Time

Relinquished by: (Signature)
Received by Mobile Laboratory for field analysis: (Signature) Date/Time

Dispatched by: (Signature) Date/Time
Received for Laboratory by: [signature] Date/Time 11-20-86 12:10pm

Method of Shipment:

Special Instructions:
Assume All Samples Are Hot

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
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CHAIN OF CUSTODY RECORD

Date 11/14/86 Page 1 of 2

CLIENT Earth Technology
ADDRESS 3777 Long Beach Blvd
Long Beach, CA 90807

PROJECT MANAGER Barbara Fontes
PHONE NUMBER (213) 595-6611

PROJECT NAME Metro Rail 87-600-0002

SAMPLERS: (Signature) R. Thomasser

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-11	Lyon & Vignes	11/14/86			X			1 gal	625, TPHC (418.1), pH
BH-11	Lyon & Vignes	11/14/86			X			2 Voa	624, VOA
BH-02	Lyon & Vignes	11/14/86			X			1 gal	625, TPHC (418.1), pH
BH-02	Lyon & Vignes	11/14/86			X			2 Voa	624 VOA

Relinquished by: (Signature) R. Thomasser 11/14/86
Received by: (Signature) Manuel Arce
Date/Time 11-14-86 3:20 PM

Relinquished by: (Signature)
Received by: (Signature)
Date/Time

Relinquished by: (Signature)
Received by Mobile Laboratory for field analysis: (Signature)
Date/Time

Dispatched by: (Signature)
Date/Time
Received for Laboratory by:
Date/Time

Method of Shipment:

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.
11631 SEABOARD CIRCLE, STANTON, CA 90680
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CHAIN OF CUSTODY RECORD

Date 11/14/86 Page 2 of 2

CLIENT EARTH TECHNOLOGY

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER
Barbara A. Fontes

PHONE NUMBER
(213) 595-6611

PROJECT NAME
METRO RAIL TRANSIT 87-600-0002

SAMPLERS: (Signature)
Rick Thomasser R Thomasser

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	SAMPLE TYPE WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-15	Ramirez + Center	11/14/86			X			2 GAL	(TPHC) 418.1 EPA, 625, PH
BH-15	Ramirez + Center	11/14/86			X			2 VOA	624 EPA
Blank	Ramirez + Center	11/14/86			X			2 Gal	EPA (TPHC) 418.1; 625; PH
Blank	Ramirez + Center	11/14/86			X			2 VOA	624 EPA

Relinquished by: (Signature) Barbara A. Fontes 11/14/86
Received by: (Signature) Manuel Arias
Date/Time 11-14-86 320PM

Relinquished by: (Signature)
Received by: (Signature)
Date/Time

Relinquished by: (Signature)
Received by Mobile Laboratory for field analysis: (Signature)
Date/Time

Dispatched by: (Signature)
Date/Time
Received for Laboratory by:
Date/Time

Method of Shipment:

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

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- ORANGE COUNTY
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CHAIN OF CUSTODY RECORD

Date 10/13/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION
ADDRESS 3777 LONG BEACH BLVD.
LONG BEACH, CALIFORNIA 90807

PROJECT MANAGER BARBARA FONTES
PHONE NUMBER (213) 595-6611

PROJECT NAME METRORAIL
87-600-0002

SAMPLERS: (Signature) Allison T. Hudson

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-11-30	550 RAMIREZ STREET	10/10/86	11:09 AM				X	1 BRASS	EPA METHOD 8240
BH-11-30	550 RAMIREZ STREET	10/10/86	11:09 AM				X	1 BRASS	EPA METHOD 8270
BH-11-25	550 RAMIREZ STREET	10/10/86	10:52 AM		X			1 GLASS	EPA METHOD 8270 or 8240 if possible!
	NOTE: COMPLETE TOTAL PETROLEUM HYDROCARBONS AND PH ON ABOVE SAMPLES.							SAMPLES	MAY BE HOT

		Date/Time
Relinquished by: (Signature) Allison T Hudson	Received by: (Signature) R Bartlett	10/13/86 4:00pm
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time 10/13/86 5PM
Method of Shipment:		

Instructions:

Modified from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

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CHAIN OF CUSTODY RECORD

Date 10/9/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER Barbara Fontes

PHONE NUMBER (213) 595-6611

PROJECT NAME
METRO RAIL TRANSIT
87-600-0002

SAMPLERS: (Signature) Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-08-60	530 Ramirez Street	10/9/86	11:09 am		X ✓			1	EPA METHOD 625
BH-08-60	530 Ramirez Street	10/9/86	11:09 am		x ✓			2	EPA METHOD 624
BH-08-60	530 Ramirez Street	10/9/86	10:31 am				X ✓	1 brass	EPA METHOD 8240
BH-08-60	530 Ramirez Street	10/9/86	10:31 am				X ✓	1 Brass	EPA MEHTOD 8270
	NOTE: COMPLETE TOTAL PETROLEUM HYDROCARBONS AND PH ON ABOVE SAMPLES. SAMPLES MAY BE HOT.								

Relinquished by: (Signature) Barbara Fontes 5:10 pm 10/9/86	Received by: (Signature)	Date/Time 10/10/86 11:40 AM
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time 10/10/86 1 pm
Method of Shipment:		

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

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CHAIN OF CUSTODY RECORD

Date 10/8/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER BARBARA FONTES

PHONE NUMBER (213) 55-6611

PROJECT NAME METRO RAIL TRANSIT
87-600-0001

SAMPLERS: (Signature) Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-08 -43.5	530 Ramirez St.	10/8/86	2:28 pm		x ✓			1	EPA METHOD 625, 418.1, p/t
BH-08 43.5	530 Ramirez St.	10/8/86	2:28 pm		x ✓			2 VOA	EPA METHOD 624
BH-08-30	530 Ramirez St.	10/8/86	11:09 am				x ✓	1 brass	EPA METHOD 8240, 418.1, p/t
BH-08-30	530 Ramirez St.	10/8/86	11:09 am				x ✓	1 brass	EPA METHOD 8270
BH-08-45	530 Ramirez St.	10/8/86	2:50 pm				x ✓	1 brass	EPA METHOD 8240, 418.1, p/t
BH-08-45	530 Ramirez St.	10/8/86	2:50 PM				x ✓	1 brass	EPA METHOD 8270
	Note: COMPLETE TOTAL PETROLEUM HYDROCARBONS AND PH ON ABOVE SAMPLES.								SAMPLES # BH-08-30 IS HOT.

Relinquished by: (Signature) 5:49 PM Barbara Fontes 10/8/86	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time 10/09/86 12:05 PM
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time 10/9/86 1 PM
Method of Shipment:		

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

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CHAIN OF CUSTODY RECORD

Date 10/3/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER BARBARA FONTES

PHONE NUMBER (213) 595-6611

PROJECT NAME METRO RAIL TRANSIT
87-600-0001

SAMPLERS: (Signature) Barbara Fontes

	SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	SAMPLE TYPE WATER Grab.	SAMPLE TYPE AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
1	BH-02-35	700 North Vignes St.	10/3/86	12:30		X			1	EPA METHOD 625*, 418.1, pH
1	BH-02-35	700 North Vignes St.	10/3/86	12:30		X			2 VOAS	EPA METHOD 624
2	BH-02-35	700 North Vignes St.	10/3/86	12:30				X	2 Brass	EPA METHOD 8240* and 8270 418.1

* 418.1 - Marking 10/3/86

NOTE: Complete total petroleum hydrocarbons and PH on above samples.

Relinquished by: (Signature) Barbara Fontes	Received by: (Signature)	Date/Time 10/3 4:30 PM
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time 10/3/86 5:30 PM
Method of Shipment:		

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

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- BAKERSFIELD
- L.A. COUNTY

CHAIN OF CUSTODY RECORD

Date 10/1/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER BARBARA FONTES

PHONE NUMBER (213) 595-6611

PROJECT NAME METRO RAIL TRANSIT
87-600-0001

SAMPLERS: (Signature) Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-08-15	Ramirez St.& Howard	10/1/86	apx. 11:30				X ✓	1	EPA METHOD 8270
BH-08-15	Ramirez St. & Howard	10/1/86	apx. 11:30				X ✓	1	EPA METHOD 8240
BH-08-15	Ramirez St. & Howard	10/1/86	apx. 11:30				X ✓		TOTAL PETROleum HYDROCARBONS
	NOTE: SAMPLES ARE HOT								

Relinquished by: (Signature) Barbara Fontes 10/1/86
Received by: (Signature) P Bantista
Date/Time 10-2-86 10:20 A...

Relinquished by: (Signature)
Received by: (Signature)
Date/Time

Relinquished by: (Signature)
Received by Mobile Laboratory for field analysis: (Signature)
Date/Time

Dispatched by: (Signature)
Date/Time
Received for Laboratory by:
Date/Time 10-2-86 11:30 AM

Method of Shipment:

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

Chain of Custody Record

Analytical**Technologies,**Inc.
San Diego, CA • Los Angeles, CA • Phoenix, AZ • Seattle, WA

DATE 9/26/86 PAGE 1 OF 1

CLIENT EARTH TECHNOLOGY CORPORATION
ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT METRO RAIL TRANSIT
SAMPLERS (SIGNATURE)

SAMPLE NO	DATE	TIME	LOCATION	CAM METALS (18)	PR. POLLUTANT METALS (13)	GENERAL MINERALS	OIL & GREASE	PETROLEUM HYDROCARBONS	BASE/NEU/ACIDS (ORGANICS)	PESTICIDES	VOLATILE ORGANICS (601/602)	VOLATILE ORGANICS (624)	TOC/TOX	NUMBER OF CONTAINERS	OBSERVATIONS/ COMMENTS
BH-06A-30	9/26/86	1:00	530 Ramirez											1	EPA METHOD 8240
BH-06A-30	"	"	"											1	EPA METHOD 8270
BH-06A-35	"	1130	"											2	EPA METHOD 624
BH-06A-35	"	"	"											1	EPA METHOD 625

RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: Barbara Fontes	9/26/86	Signature: R.J. Bartley	9/26/86	Signature: R.J. Bartley	9/26	Signature	
Printed Name: Barbara Fontes	TIME 6:11	Printed Name: R.J. Bartley	TIME 6:11	Printed Name: R.J. Bartley	TIME 7:53	Printed Name	TIME
Company: Earth Tech.		Company: CRL Environmental		Company: CRL Environmental		Company	
RELINQUISHED BY	DATE	RECEIVED BY	DATE	RELINQUISHED BY	DATE	RECEIVED BY (laboratory)	DATE
Signature		Signature		Signature		Signature: C.R.L.	9/26
Printed Name	TIME	Printed Name	TIME	Printed Name	TIME	Printed Name	TIME 8:00PM
Company		Company		Company		Analytical Technologies, Inc.	

TOTAL NUMBER OF CONTAINERS

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS

DISTRIBUTION: WHITE, CANARY - ANALYTICAL TECHNOLOGIES, INC. • PINK ORIGINATOR

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

- ORANGE COUNTY
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CHAIN OF CUSTODY RECORD

Date 9/25/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd
Long Beach, CA 90807

PROJECT MANAGER BARBARA FONTES

PHONE NUMBER (213) 595-6611

PROJECT NAME METRO RAIL TRANSIT
87-600-0001/0002*

SAMPLERS: (Signature) Barbara Fontes

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	WATER Grab.	AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-06-30	530 Ramirez Street	9/25/86	12:00		X 6F		X ✓	1-brass	EPA METHOD 8240
BH-06-30	530 Ramirez Street	9/25/86	12:00		X 6F		X ✓	1-brass	EPA METHOD 8270
BH-06-55	530 Ramirez Street	9/25/86	3:00		X ✓			1-gal	EPA METHOD 625
BH-06-55	530 Ramirez Street	9/25/86	3:00		X ✓			2-VOAS	EPA METHOD 624

Relinquished by: (Signature) Barbara Fontes

Received by: (Signature)

Date/Time 9/26/86 5:30PM

Relinquished by: (Signature)

Received by: (Signature)

Date/Time

Relinquished by: (Signature)

Received by Mobile Laboratory for field analysis: (Signature)

Date/Time

Dispatched by: (Signature)

Date/Time

Received for Laboratory by:

Date/Time 9/26/86 5:30 PM

Method of Shipment:

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES, INC.

11631 SEABOARD CIRCLE, STANTON, CA 90680
TEL. NOS.: (714) 898-6370 (213) 598-0458

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CHAIN OF CUSTODY RECORD

Date 10/3/86 Page 1 of 1

CLIENT EARTH TECHNOLOGY CORPORATION

ADDRESS 3777 Long Beach Blvd.
Long Beach, CA 90807

PROJECT MANAGER BARBARA FONTES

PHONE NUMBER (213) 595-6611

PROJECT NAME METRO RAIL TRANSIT
87-600-0001

SAMPLERS: (Signature)

SAMPLE NUMBER	LOCATION DESCRIPTION	DATE	TIME	SAMPLE TYPE WATER Comp.	SAMPLE TYPE WATER Grab.	SAMPLE TYPE AIR	SOLID	NO. OF CNTNRS	TESTS REQUIRED
BH-04	Traffic Island 57 feet	9/2/86	7:30PM		X			1	EPA METHOD 625*, 418.1, pH
BH-04	Traffic Island 57 feet	9/2/86	7:30 PM		X			2	EPA METHOD 624
BH-01	700 Vignes Street 30 ft.	9/2/86			X	✓		1	EPA METHOD 625*, 418.1, pH
BH-01	700 Vigness Street 30 ft.	9/2/86			X	✓	BF	2	EPA METHOD 624
BH-01	700 Vigness St. 30 ft.	9/2/86	30 feet				X	2	EPA METHOD 8240* and 8270, 418.1, pH
BH-04	Traffic Island 25 feet	9/2/86					X	2	EPA METHOD 8240* and 8270, 418.1, pH

418.1 mak list 10/3/86

NOTE: *ALL SAMPLES TO ALSO HAVE TOTAL PETROLEUM HYDROCARBONS AND PH

Relinquished by: (Signature) Barbara Fontes	Received by: (Signature)	Date/Time 6:02
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date/Time
Dispatched by: (Signature) / Date/Time	Received for Laboratory by:	Date/Time 10/3/86 5:30PM

Method of Shipment:

Special Instructions:

SOURCE: Adapted from U.S. EPA, 1985

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

Monitoring Well

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861114-78
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

Metro Rail 87-600-0002 - BH 11 - Lyon & Vignes (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	18 *	1,1,2-Trichloroethane	< 5
Acetone	20 *	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	15	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	7
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* Common laboratory contaminant

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/12/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

Monitoring Well

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861114-79
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

Metro Rail 87-600-0002 - BH 02 - Lyon & Vignes (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	19 *	1,1,2-Trichloroethane	< 5
Acetone	16 *	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* Common laboratory contaminant

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/2/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

Monitoring Well

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861114-78
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

Metro Rail 87-600-0002 - BH 11 - Lyon & Vignes (liquid)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	<40.	Acenaphthene	<40.
bis(-2-Chloroethyl)Ether	<40.	2,4-Dinitrophenol	<200.
2-Chlorophenol	<40.	4-Nitrophenol	<200.
1,3-Dichlorobenzene	<40.	Dibenzofuran	<40.
1,4-Dichlorobenzene	<40.	2,4-Dinitrotoluene	<40.
Benzyl Alcohol	<40.	2,6-Dinitrotoluene	<40.
1,2-Dichlorobenzene	<40.	Diethylphthalate	<40.
2-Methylphenol	<40.	4-Chlorophenyl-phenylether	<40.
bis(2-chloroisopropy1)Ether	<40.	Fluorene	<40.
4-Methylphenol	<40.	4-Nitroaniline	<200.
N-Nitroso-Di-n-Propylamine	<40.	4,6-Dinitro-2-Methylphenol	<200.
Hexachloroethane	<40.	N-Nitrosodiphenylamine (1)	<40.
Nitrobenzene	<40.	4-Bromophenyl-phenylether	<40.
Isophorone	<40.	Hexachlorobenzene	<40.
2-Nitrophenol	<40.	Pentachlorophenol	<200.
2,4-Dimethylphenol	<40.	Phenanthrene	<40.
Benzoic Acid	<200.	Anthracene	<40.
bis(-2-Chloroethoxy)Methane	<40.	Di-n-Butylphthalate	<40.
2,4-Dichlorophenol	<40.	Fluoranthene	<40.
1,2,4-Trichlorobenzene	<40.	Pyrene	<40.
Naphthalene	<40.	Butylbenzylphthatlate	<40.
4-Chloroaniline	<40.	3,3-Dichlorobenzidine	<80.
Hexachlorobutadiene	<40.	Benzo(a)Anthracene	<40.
4-Chloro-3-Methylphenol	<40.	bis(2-Ethylhexyl)Phthalate	<40.
2-Methylnaphthalene	<40.	Chrysene	<40.
Hexachlorocyclopentadiene	<40.	Di-n-Octyl Phthalate	<40.
2,4,6-Trichlorophenol	<40.	Benzo(b)Fluoranthene	<40.
2,4,5-Trichlorophenol	<40.	Benzo(k)Fluoranthene	<40.
2-Chloronaphthalene	<40.	Benzo(a)Pyrene	<40.
2-Nitroaniline	<200.	Indeno(1,2,3-cd)Pyrene	<40.
Dimethyl Phthalate	<40.	Dibenzo(a,h)Anthracene	<40.
Acenaphthylene	<40.	Benzo(g,h,i)Perylene	<40.
3-Nitroaniline	<200.		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/9/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

Monitoring Well

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861114-79
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

Metro Rail 87-600-0002 - BH 02 - Lyon & Vignes (liquid)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	<40.	Acenaphthene	<40.
bis(-2-Chloroethyl)Ether	<40.	2,4-Dinitrophenol	<200.
2-Chlorophenol	<40.	4-Nitrophenol	<200.
1,3-Dichlorobenzene	<40.	Dibenzofuran	<40.
1,4-Dichlorobenzene	<40.	2,4-Dinitrotoluene	<40.
Benzyl Alcohol	<40.	2,6-Dinitrotoluene	<40.
1,2-Dichlorobenzene	<40.	Diethylphthalate	<40.
2-Methylphenol	<40.	4-Chlorophenyl-phenylether	<40.
bis(2-chloroisopropy1)Ether	<40.	Fluorene	<40.
4-Methylphenol	<40.	4-Nitroaniline	<200.
N-Nitroso-Di-n-Propylamine	<40.	4,6-Dinitro-2-Methylphenol	<200.
Hexachloroethane	<40.	N-Nitrosodiphenylamine (1)	<40.
Nitrobenzene	<40.	4-Bromophenyl-phenylether	<40.
Isophorone	<40.	Hexachlorobenzene	<40.
2-Nitrophenol	<40.	Pentachlorophenol	<200.
2,4-Dimethylphenol	<40.	Phenanthrene	<40.
Benzoic Acid	<200.	Anthracene	<40.
bis(-2-Chloroethoxy)Methane	<40.	Di-n-Butylphthalate	<40.
2,4-Dichlorophenol	<40.	Fluoranthene	<40.
1,2,4-Trichlorobenzene	<40.	Pyrene	<40.
Naphthalene	<40.	Butylbenzylphthatlate	<40.
4-Chloroaniline	<40.	3,3-Dichlorobenzidine	<80.
Hexachlorobutadiene	<40.	Benzo(a)Anthracene	<40.
4-Chloro-3-Methylphenol	<40.	bis(2-Ethylhexyl)Phthalate	<40.
2-Methylnaphthalene	<40.	Chrysene	<40.
Hexachlorocyclopentadiene	<40.	Di-n-Octyl Phthalate	<40.
2,4,6-Trichlorophenol	<40.	Benzo(b)Fluoranthene	<40.
2,4,5-Trichlorophenol	<40.	Benzo(k)Fluoranthene	<40.
2-Chloronaphthalene	<40.	Benzo(a)Pyrene	<40.
2-Nitroaniline	<200.	Indeno(1,2,3-cd)Pyrene	<40.
Dimethyl Phthalate	<40.	Dibenzo(a,h)Anthracene	<40.
Acenaphthylene	<40.	Benzo(g,h,i)Perylene	<40.
3-Nitroaniline	<200.		

<Denotes compound was not detected above the value indicated.

MH
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/9/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

Monitoring Well

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861114-81
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

Metro Rail 87-600-0002 - Blank - Ramirez & Center (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l			ug/l
Chloromethane	<10		1,2-Dichloropropane	< 5
Bromomethane	<10		Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10		Trichloroethene	< 5
Chloroethane	<10		Dibromochloromethane	< 5
Methylene Chloride	55	*	1,1,2-Trichloroethane	< 5
Acetone	<10		Benzene	< 5
Carbon Disulfide	< 5		cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5		2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5		Bromoform	< 5
Trans-1,2-Dichloroethene	< 5		4-Methyl-2-Pentanone	<10
Chloroform	16	*	2-Hexanone	<10
1,2-Dichloroethane	< 5		Tetrachloroethene	< 5
2-Butanone	<10		1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5		Toluene	< 5
Carbon Tetrachloride	< 5		Chlorobenzene	< 5
Vinyl Acetate	<10		Ethylbenzene	< 5
Bromodichloromethane	< 5		Styrene	< 5
			Total Xylenes	< 5

* Compound found in laboratory blanks

< Denotes compound was not detected above the value indicated.

mt
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/12/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

Monitoring Well

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861114-81
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

Metro Rail 87-600-0002 - Blank - Ramirez & Center (liquid)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	<40.	Acenaphthene	<40.
bis(-2-Chloroethyl)Ether	<40.	2,4-Dinitrophenol	<200.
2-Chlorophenol	<40.	4-Nitrophenol	<200.
1,3-Dichlorobenzene	<40.	Dibenzofuran	<40.
1,4-Dichlorobenzene	<40.	2,4-Dinitrotoluene	<40.
Benzyl Alcohol	<40.	2,6-Dinitrotoluene	<40.
1,2-Dichlorobenzene	<40.	Diethylphthalate	<40.
2-Methylphenol	<40.	4-Chlorophenyl-phenylether	<40.
bis(2-chloroisopropyl)Ether	<40.	Fluorene	<40.
4-Methylphenol	<40.	4-Nitroaniline	<200.
N-Nitroso-Di-n-Propylamine	<40.	4,6-Dinitro-2-Methylphenol	<200.
Hexachloroethane	<40.	N-Nitrosodiphenylamine (1)	<40.
Nitrobenzene	<40.	4-Bromophenyl-phenylether	<40.
Isophorone	<40.	Hexachlorobenzene	<40.
2-Nitrophenol	<40.	Pentachlorophenol	<200.
2,4-Dimethylphenol	<40.	Phenanthrene	<40.
Benzoic Acid	<200.	Anthracene	<40.
bis(-2-Chloroethoxy)Methane	<40.	Di-n-Butylphthalate	<40.
2,4-Dichlorophenol	<40.	Fluoranthene	<40.
1,2,4-Trichlorobenzene	<40.	Pyrene	<40.
Naphthalene	<40.	Butylbenzylphthatlate	<40.
4-Chloroaniline	<40.	3,3-Dichlorobenzidine	<80.
Hexachlorobutadiene	<40.	Benzo(a)Anthracene	<40.
4-Chloro-3-Methylphenol	<40.	bis(2-Ethylhexyl)Phthalate	<40.
2-Methylnaphthalene	<40.	Chrysene	<40.
Hexachlorocyclopentadiene	<40.	Di-n-Octyl Phthalate	<40.
2,4,6-Trichlorophenol	<40.	Benzo(b)Fluoranthene	<40.
2,4,5-Trichlorophenol	<40.	Benzo(k)Fluoranthene	<40.
2-Chloronaphthalene	<40.	Benzo(a)Pyrene	<40.
2-Nitroaniline	<200.	Indeno(1,2,3-cd)Pyrene	<40.
Dimethyl Phthalate	<40.	Dibenzo(a,h)Anthracene	<40.
Acenaphthylene	<40.	Benzo(g,h,i)Perylene	<40.
3-Nitroaniline	<200.		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/9/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE: Metro Rail Transit 87-600-0002 (liquid)

ANALYSIS NO.: 861121-62
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

SAMPLE ID	SULFIDE in mg/l
BH-07-50	2.02

LC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/12/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-55
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

NATURE OF SAMPLE: Metro Rail Transit 87-600-0002 Field adjacent to center

SAMPLE ID	SULFIDE in mg/l
BH-09-50 (water)	*ND(0.1)

*Not Detected (Below indicated limit of detection.)

LC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/1/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 (liquid)

ANALYSIS NO.: 861125-53 & 57
SAMPLING DATE: 11/21 & 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

SAMPLE ID	SULFIDE in mg/l
BH-10-55 Ramirez St.	2.23
BH-05-40 Dennys	0.51

ANALYST LC

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002

ANALYSIS NO.: 861125-52/57
SAMPLING DATE: 11/21 & 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

SAMPLE ID	pH, in units
BH-10-35 Ramirez St. (soil)	8.63
BH-10-55 Ramirez St. (liquid)	7.19
BH-05-40 Dennys (soil)	8.84
BH-05-35 Dennys (soil)	8.96
BH-05-45 Dennys (soil)	7.42
BH-05-45 Dennys (liquid)	7.20

JR
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002

ANALYSIS NO.: 861121-61/62
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

SAMPLE ID	pH, in units
BH-07-30 (soil)	6.15
BH-07-50 (liquid)	6.88

JR
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/7/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861010-60/61
SAMPLING DATE: 10/09/86
DATE SAMPLE REC'D: 10/10/86
INVOICE NO.: 17883

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0002 - 530 Ramirez Street

SAMPLE ID	pH, in units
BH-08-60 Water	7.48
BH-08-60 Soil	8.25

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861009-55/57
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - 530 Ramirez Street

SAMPLE ID		pH, in units
BH-08 - 43.5	water	7.42
BH-08-30	Soil	8.34
BH-08-45	Soil	8.52

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-55/57
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

NATURE OF SAMPLE: Metro Rail Transit 87-600-0002 Field adjacent to center

SAMPLE ID	pH, in units
BH-09-50 (water)	7.22
BH-09-30 (solids)	8.89
BH-09-50 (solids)	8.19

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail 87-600-0002 (liquid)

ANALYSIS NO.: 861114-78/81
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

SAMPLE ID	pH, in units
BH-11 Lyon & Vignes	6.39
BH-02 Lyon & Vignes	6.32
BH-15 Ramirez & Center	6.36
Blank Ramirez & Center	5.98

NOTE: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/9/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001

ANALYSIS NO.: 861006-12/-17
SAMPLING DATE: See Below
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

RESULTS, in mg/kg

SAMPLE IDENTIFICATION	pH (units)	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-02-35 Water 10/03/86	6.59	1.4
BH-02-35 Soil 10/03/86	8.07	2.5
BH-04 Water 09/06/86	7.81	*ND(1.)
BH-01 Water 09/06/86	6.66	*ND(1.)
BH-01 Soil 09/06/86	4.60	2.5
BH-04 Soil 09/06/86	7.44	3.

*Not detected (Below indicated limit of detection.)

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0022

ANALYSIS NO.: 861125-52/57
SAMPLING DATE: 11/21 & 11/25/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

RESULTS

SAMPLE IDENTIFICATION	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-10-35 Ramirez St. (soil)	12,200. mg/kg
BH-10-55 Ramirez St. (liquid)	128. mg/l
BH-05-40 Dennys (soil)	40. mg/kg
BH-05-35 Dennys (soil)	32. mg/kg
BH-05-45 Dennys (soil)	10. mg/kg
BH-05-45 Dennys (liquid)	9. mg/l

NOTE: Samples were received in a chilled state, intact and with chain of custody record attached.

JFC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/12/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002

ANALYSIS NO.: 861121-61/62
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

RESULTS

SAMPLE IDENTIFICATION	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-07-30 (soil)	23. mg/kg
BH-07-50 (liquid)	2. mg/l

NOTE: Samples were received in a chilled state, intact and with chain of custody record attached.

JFC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/12/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861009-55/57
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-001 - 530 Ramirez Street

SAMPLE IDENTIFICATION		TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)	
BH-08 - 43.5	water	2.0	mg/l
BH-08-30	Soil	46.	mg/kg
BH-08-45	Soil	*ND(1.)	mg/kg

*Not Detected (Below indicated limit of detection.)

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

JFC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/20/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861010-60/61
SAMPLING DATE: 10/09/86
DATE SAMPLE REC'D: 10/10/86
INVOICE NO.: 17883

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-002 - 530 Ramirez Street

SAMPLE IDENTIFICATION	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-08-60 Water	2.5 mg/l
BH-08-60 Soil	4.0 mg/kg

JRC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861121-55/57
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

Metro Rail Transit 86-600-0002 Field adjacent to center

RESULTS

SAMPLE IDENTIFICATION	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-09-50 (water)	4. mg/l
BH-09-30 (solids)	130. mg/kg
BH-09-50 (solids)	5. mg/kg

NOTE: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861014-26 & -27
SAMPLING DATE: 10/10/86
DATE SAMPLE REC'D: 10/14/86
INVOICE NO.: 17934

Metrorail 87-600-0002 - 550 Ramirez Street - Soil

RESULTS, in mg/kg

SAMPLE IDENTIFICATION	pH (units)	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-11-30 at 11:09 A.M.	9.03	640.
BH-11-25 at 10:52 A.M.	10.35	10,800.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

JFC
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 11/3/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail 87-600-0002 (liquid)

ANALYSIS NO.: 861114-78/81
SAMPLING DATE: 11/14/86
DATE SAMPLE REC'D: 11/14/86
INVOICE NO.: 18373

RESULTS, in mg/l

SAMPLE IDENTIFICATION	TOTAL PETROLEUM HYDROCARBONS (EPA 418.1)
BH-11 Lyon & Vignes	*ND(1.0)
BH-02 Lyon & Vignes	*ND(1.0)
BH-15 Ramirez & Center	*ND(1.0)
Blank Ramirez & Center	*ND(1.0)

*Not Detected (Below indicated limit of detection.)

NOTE: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

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DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861125-58
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

NATURE OF SAMPLE: Metro Rail Transit 87-600-0002 - Travel Blank (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l			ug/l
Chloromethane	<10		1,2-Dichloropropane	< 5
Bromomethane	<10		Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10		Trichloroethene	< 5
Chloroethane	< 5		Dibromochloromethane	< 5
Methylene Chloride	9	*	1,1,2-Trichloroethane	< 5
Acetone	44	*	Benzene	< 5
Carbon Disulfide	< 5		cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5		2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5		Bromoform	< 5
Trans-1,2-Dichloroethene	< 5		4-Methyl-2-Pentanone	<10
Chloroform	< 5		2-Hexanone	<10
1,2-Dichloroethane	< 5		Tetrachloroethene	< 5
2-Butanone	<10		1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5		Toluene	< 5
Carbon Tetrachloride	< 5		Chlorobenzene	< 5
Vinyl Acetate	<10		Ethylbenzene	< 5
Bromodichloromethane	< 5		Styrene	< 5
			Total Xylenes	< 5

* Also present in lab blank

< Denotes compound was not detected above the value indicated.

SP
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DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-15
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-01 Water BH-01-30

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	< 20	Acenaphthene	< 20
bis(-2-Chloroethyl)Ether	< 20	2,4-Dinitrophenol	<100
2-Chlorophenol	< 20	4-Nitrophenol	<100
1,3-Dichlorobenzene	< 20	Dibenzofuran	< 20
1,4-Dichlorobenzene	< 20	2,4-Dinitrotoluene	< 20
Benzyl Alcohol	< 20	2,6-Dinitrotoluene	< 20
1,2-Dichlorobenzene	< 20	Diethylphthalate	< 20
2-Methylphenol	< 20	4-Chlorophenyl-phenylether	< 20
bis(2-chloroisopropy1)Ether	< 20	Fluorene	< 20
4-Methylphenol	< 20	4-Nitroaniline	<100
N-Nitroso-Di-n-Propylamine	< 20	4,6-Dinitro-2-Methylphenol	<100
Hexachloroethane	< 20	N-Nitrosodiphenylamine (1)	< 20
Nitrobenzene	< 20	4-Bromophenyl-phenylether	< 20
Isophorone	< 20	Hexachlorobenzene	< 20
2-Nitrophenol	< 20	Pentachlorophenol	<100
2,4-Dimethylphenol	< 20	Phenanthrene	< 20
Benzoic Acid	<100	Anthracene	< 20
bis(-2-Chloroethoxy)Methane	< 20	Di-n-Butylphthalate	< 20
2,4-Dichlorophenol	< 20	Fluoranthene	< 20
1,2,4-Trichlorobenzene	< 20	Pyrene	< 20
Naphthalene	< 20	Butylbenzylphthatlate	< 20
4-Chloroaniline	< 20	3,3-Dichlorobenzidine	< 40
Hexachlorobutadiene	< 20	Benzo(a)Anthracene	< 20
4-Chloro-3-Methylphenol	< 20	bis(2-Ethylhexyl)Phthalate	< 20
2-Methylnaphthalene	< 20	Chrysene	< 20
Hexachlorocyclopentadiene	< 20	Di-n-Octyl Phthalate	< 20
2,4,6-Trichlorophenol	< 20	Benzo(b)Fluoranthene	< 20
2,4,5-Trichlorophenol	< 20	Benzo(k)Fluoranthene	< 20
2-Chloronaphthalene	< 20	Benzo(a)Pyrene	< 20
2-Nitroaniline	<100	Indeno(1,2,3-cd)Pyrene	< 20
Dimethyl Phthalate	< 20	Dibenzo(a,h)Anthracene	< 20
Acenaphthylene	< 20	Benzo(g,h,i)Perylene	< 20
3-Nitroaniline	<100		

ANALYST

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CHEMICAL RESEARCH LABORATORIES
DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

Amended Report

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-12
SAMPLING DATE: 10/03/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-02-35 Water

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	< 20	Acenaphthene	< 20
bis(-2-Chloroethyl)Ether	< 20	2,4-Dinitrophenol	<100
2-Chlorophenol	< 20	4-Nitrophenol	<100
1,3-Dichlorobenzene	< 20	Dibenzofuran	< 20
1,4-Dichlorobenzene	< 20	2,4-Dinitrotoluene	< 20
Benzyl Alcohol	< 20	2,6-Dinitrotoluene	< 20
1,2-Dichlorobenzene	< 20	Diethylphthalate	< 20
2-Methylphenol	< 20	4-Chlorophenyl-phenylether	< 20
bis(2-chloroisopropy1)Ether	< 20	Fluorene	< 20
4-Methylphenol	< 20	4-Nitroaniline	<100
N-Nitroso-Di-n-Propylamine	< 20	4,6-Dinitro-2-Methylphenol	<100
Hexachloroethane	< 20	N-Nitrosodiphenylamine (1)	< 20
Nitrobenzene	< 20	4-Bromophenyl-phenylether	< 20
Isophorone	< 20	Hexachlorobenzene	< 20
2-Nitrophenol	< 20	Pentachlorophenol	<100
2,4-Dimethylphenol	< 20	Phenanthrene	< 20
Benzoic Acid	<100	Anthracene	< 20
bis(-2-Chloroethoxy)Methane	< 20	Di-n-Butylphthalate	< 20
2,4-Dichlorophenol	< 20	Fluoranthene	< 20
1,2,4-Trichlorobenzene	< 20	Pyrene	< 20
Naphthalene	< 20	Butylbenzylphthatlate	< 20
4-Chloroaniline	< 20	3,3-Dichlorobenzidine	< 40
Hexachlorobutadiene	< 20	Benzo(a)Anthracene	< 20
4-Chloro-3-Methylphenol	< 20	bis(2-Ethylhexyl)Phthalate	< 20
2-Methylnaphthalene	< 20	Chrysene	< 20
Hexachlorocyclopentadiene	< 20	Di-n-Octyl Phthalate	< 20
2,4,6-Trichlorophenol	< 20	Benzo(b)Fluoranthene	< 20
2,4,5-Trichlorophenol	< 20	Benzo(k)Fluoranthene	< 20
2-Chloronaphthalene	< 20	Benzo(a)Pyrene	< 20
2-Nitroaniline	<100	Indeno(1,2,3-cd)Pyrene	< 20
Dimethyl Phthalate	< 20	Dibenzo(a,h)Anthracene	< 20
Acenaphthylene	< 20	Benzo(g,h,i)Rerylene	< 20
3-Nitroaniline	<100		

MH

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CHEMICAL RESEARCH LABORATORIES

DATE 10/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861006-14
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-04 Water BH-04-57

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	< 20	Acenaphthene	32
bis(-2-Chloroethyl)Ether	< 20	2,4-Dinitrophenol	<100
2-Chlorophenol	< 20	4-Nitrophenol	<100
1,3-Dichlorobenzene	< 20	Dibenzofuran	< 20
1,4-Dichlorobenzene	< 20	2,4-Dinitrotoluene	< 20
Benzyl Alcohol	< 20	2,6-Dinitrotoluene	< 20
1,2-Dichlorobenzene	< 20	Diethylphthalate	< 20
2-Methylphenol	< 20	4-Chlorophenyl-phenylether	< 20
bis(2-chloroisopropy1)Ether	< 20	Fluorene	< 20
4-Methylphenol	< 20	4-Nitroaniline	<100
N-Nitroso-Di-n-Propylamine	< 20	4,6-Dinitro-2-Methylphenol	<100
Hexachloroethane	< 20	N-Nitrosodiphenylamine (1)	< 20
Nitrobenzene	< 20	4-Bromophenyl-phenylether	< 20
Isophorone	< 20	Hexachlorobenzene	< 20
2-Nitrophenol	< 20	Pentachlorophenol	<100
2,4-Dimethylphenol	< 20	Phenanthrene	26
Benzoic Acid	<100	Anthracene	< 20
bis(-2-Chloroethoxy)Methane	< 20	Di-n-Butylphthalate	< 20
2,4-Dichlorophenol	< 20	Fluoranthene	< 20
1,2,4-Trichlorobenzene	< 20	Pyrene	< 20
Naphthalene	42	Butylbenzylphthatlate	< 20
4-Chloroaniline	< 20	3,3-Dichlorobenzidine	< 40
Hexachlorobutadiene	< 20	Benzo(a)Anthracene	< 20
4-Chloro-3-Methylphenol	< 20	bis(2-Ethylhexyl)Phthalate	< 20
2-Methylnaphthalene	< 20	Chrysene	< 20
Hexachlorocyclopentadiene	< 20	Di-n-Octyl Phthalate	< 20
2,4,6-Trichlorophenol	< 20	Benzo(b)Fluoranthene	< 20
2,4,5-Trichlorophenol	< 20	Benzo(k)Fluoranthene	< 20
2-Chloronaphthalene	< 20	Benzo(a)Pyrene	< 20
2-Nitroaniline	<100	Indeno(1,2,3-cd)Pyrene	< 20
Dimethyl Phthalate	< 20	Dibenzo(a,h)Anthracene	< 20
Acenaphthylene	< 20	Benzo(g,h,i)Perylene	< 20
3-Nitroaniline	<100		

ANALYST

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CHEMICAL RESEARCH LABORATORIES

DATE 10/16/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-57
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-05-45 Dennys (liquid)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/l		mg/l
Phenol	<0.2	Acenaphthene	<0.2
bis(-2-Chloroethyl)Ether	<0.2	2,4-Dinitrophenol	<1
2-Chlorophenol	<0.2	4-Nitrophenol	<1
1,3-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,4-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<0.2
Benzyl Alcohol	<0.2	2,6-Dinitrotoluene	<0.2
1,2-Dichlorobenzene	<0.2	Diethylphthalate	<0.2
2-Methylphenol	<0.2	4-Chlorophenyl-phenylether	<0.2
bis(2-chloroisopropyl)Ether	<0.2	Fluorene	<0.2
4-Methylphenol	<0.2	4-Nitroaniline	<1
N-Nitroso-Di-n-Propylamine	<0.2	4,6-Dinitro-2-Methylphenol	<1
Hexachloroethane	<0.2	N-Nitrosodiphenylamine (1)	<0.2
Nitrobenzene	<0.2	4-Bromophenyl-phenylether	<0.2
Isophorone	<0.2	Hexachlorobenzene	<0.2
2-Nitrophenol	<0.2	Pentachlorophenol	<1
2,4-Dimethylphenol	<0.2	Phenanthrene	0.2
Benzoic Acid	<1	Anthracene	<0.2
bis(-2-Chloroethoxy)Methane	<0.2	Di-n-Butylphthalate	<0.2
2,4-Dichlorophenol	<0.2	Fluoranthene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pyrene	0.2
Naphthalene	<0.2	Butylbenzylphthatlate	<0.2
4-Chloroaniline	<0.2	3,3-Dichlorobenzidine	<0.4
Hexachlorobutadiene	<0.2	Benzo(a)Anthracene	<0.2
4-Chloro-3-Methylphenol	<0.2	bis(2-Ethylhexyl)Phthalate	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
Hexachlorocyclopentadiene	<0.2	Di-n-Octyl Phthalate	<0.2
2,4,6-Trichlorophenol	<0.2	Benzo(b)Fluoranthene	<0.2
2,4,5-Trichlorophenol	<0.2	Benzo(k)Fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(a)Pyrene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)Pyrene	<0.2
Dimethyl Phthalate	<0.2	Dibenzo(a,h)Anthracene	<0.2
Acenaphthylene	0.1	Benzo(g,h,i)Perylene	<0.2
3-Nitroaniline	<1		

<Denotes compound was not detected above the value indicated.

ANALYST

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CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 860926-42
SAMPLING DATE: 09/25/86 3:00
DATE SAMPLE REC'D: 09/26/86
INVOICE NO.: 17691

Metro Rail Transit - #87-600-0001-0002 - BH-06-55 - 530 Ramirez Street

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<10	Acenaphthene	<10
bis(-2-Chloroethyl)Ether	<10	2,4-Dinitrophenol	<50
2-Chlorophenol	<10	4-Nitrophenol	<50
1,3-Dichlorobenzene	<10	Dibenzofuran	<10
1,4-Dichlorobenzene	<10	2,4-Dinitrotoluene	<10
Benzyl Alcohol	<10	2,6-Dinitrotoluene	<10
1,2-Dichlorobenzene	<10	Diethylphthalate	<10
2-Methylphenol	<10	4-Chlorophenyl-phenylether	<10
bis(2-chloroisopropy1)Ether	<10	Fluorene	<10
4-Methylphenol	<10	4-Nitroaniline	<50
N-Nitroso-Di-n-Propylamine	<10	4,6-Dinitro-2-Methylphenol	<50
Hexachloroethane	<10	N-Nitrosodiphenylamine (1)	<10
Nitrobenzene	<10	4-Bromophenyl-phenylether	<10
Isophorone	<10	Hexachlorobenzene	<10
2-Nitrophenol	<10	Pentachlorophenol	<50
2,4-Dimethylphenol	<10	Phenanthrene	<10
Benzoic Acid	<50	Anthracene	<10
bis(-2-Chloroethoxy)Methane	<10	Di-n-Butylphthalate	<10
2,4-Dichlorophenol	<10	Fluoranthene	<10
1,2,4-Trichlorobenzene	<10	Pyrene	<10
Naphthalene	<10	Butylbenzylphthatlate	<10
4-Chloroaniline	<10	3,3-Dichlorobenzidine	<20
Hexachlorobutadiene	<10	Benzo(a)Anthracene	<10
4-Chloro-3-Methylphenol	<10	bis(2-Ethylhexyl)Phthalate	<10
2-Methylnaphthalene	<10	Chrysene	<10
Hexachlorocyclopentadiene	<10	Di-n-Octyl Phthalate	<10
2,4,6-Trichlorophenol	<10	Benzo(b)Fluoranthene	<10
2,4,5-Trichlorophenol	<10	Benzo(k)Fluoranthene	<10
2-Chloronaphthalene	<10	Benzo(a)Pyrene	<10
2-Nitroaniline	<50	Indeno(1,2,3-cd)Pyrene	<10
Dimethyl Phthalate	<10	Dibenzo(a,h)Anthracene	<10
Acenaphthylene	<10	Benzo(g,h,i)Perylene	<10
3-Nitroaniline	<50		

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CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Tan Phung

NATURE OF SAMPLE:

Metro Rail Transit - BH-06A-35 530 Ramirez

ANALYSIS NO.: 860929-30
SAMPLING DATE: 09/26/86 1:30
DATE SAMPLE REC'D: 09/29/86
INVOICE NO.: 17690

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	<10	Acenaphthene	<10
bis(-2-Chloroethyl)Ether	<10	2,4-Dinitrophenol	<50
2-Chlorophenol	<10	4-Nitrophenol	<50
1,3-Dichlorobenzene	<10	Dibenzofuran	<10
1,4-Dichlorobenzene	<10	2,4-Dinitrotoluene	<10
Benzyl Alcohol	<10	2,6-Dinitrotoluene	<10
1,2-Dichlorobenzene	<10	Diethylphthalate	<10
2-Methylphenol	<10	4-Chlorophenyl-phenylether	<10
bis(2-chloroisopropyl)Ether	<10	Fluorene	<10
4-Methylphenol	<10	4-Nitroaniline	<50
N-Nitroso-Di-n-Propylamine	<10	4,6-Dinitro-2-Methylphenol	<50
Hexachloroethane	<10	N-Nitrosodiphenylamine (1)	<10
Nitrobenzene	<10	4-Bromophenyl-phenylether	<10
Isophorone	<10	Hexachlorobenzene	<10
2-Nitrophenol	<10	Pentachlorophenol	<50
2,4-Dimethylphenol	<10	Phenanthrene	<10
Benzoic Acid	<50	Anthracene	<10
bis(-2-Chloroethoxy)Methane	<10	Di-n-Butylphthalate	<10
2,4-Dichlorophenol	<10	Fluoranthene	<10
1,2,4-Trichlorobenzene	<10	Pyrene	<10
Naphthalene	<10	Butylbenzylphthatlate	<10
4-Chloroaniline	<10	3,3-Dichlorobenzidine	<20
Hexachlorobutadiene	<10	Benzo(a)Anthracene	<10
4-Chloro-3-Methylphenol	<10	bis(2-Ethylhexyl)Phthalate	<10
2-Methylnaphthalene	<10	Chrysene	<10
Hexachlorocyclopentadiene	<10	Di-n-Octyl Phthalate	<10
2,4,6-Trichlorophenol	<10	Benzo(b)Fluoranthene	<10
2,4,5-Trichlorophenol	<10	Benzo(k)Fluoranthene	<10
2-Chloronaphthalene	<10	Benzo(a)Pyrene	<10
2-Nitroaniline	<50	Indeno(1,2,3-cd)Pyrene	<10
Dimethyl Phthalate	<10	Dibenzo(a,h)Anthracene	<10
Acenaphthylene	<10	Benzo(g,h,i)Perylene	<10
3-Nitroaniline	<50		

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/10/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-62
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 - BH-07-50 - (liquid)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/l		mg/l
Phenol	<0.2	Acenaphthene	<0.2
bis(-2-Chloroethyl)Ether	<0.2	2,4-Dinitrophenol	<1
2-Chlorophenol	<0.2	4-Nitrophenol	<1
1,3-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,4-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<0.2
Benzyl Alcohol	<0.2	2,6-Dinitrotoluene	<0.2
1,2-Dichlorobenzene	<0.2	Diethylphthalate	<0.2
2-Methylphenol	<0.2	4-Chlorophenyl-phenylether	<0.2
bis(2-chloroisopropy1)Ether	<0.2	Fluorene	<0.2
4-Methylphenol	<0.2	4-Nitroaniline	<1
N-Nitroso-Di-n-Propylamine	<0.2	4,6-Dinitro-2-Methylphenol	<1
Hexachloroethane	<0.2	N-Nitrosodiphenylamine (1)	<0.2
Nitrobenzene	<0.2	4-Bromophenyl-phenylether	<0.2
Isophorone	<0.2	Hexachlorobenzene	<0.2
2-Nitrophenol	<0.2	Pentachlorophenol	<1
2,4-Dimethylphenol	<0.2	Phenanthrene	0.08
Benzoic Acid	<1	Anthracene	<0.2
bis(-2-Chloroethoxy)Methane	<0.2	Di-n-Butylphthalate	<0.2
2,4-Dichlorophenol	<0.2	Fluoranthene	0.04
1,2,4-Trichlorobenzene	<0.2	Pyrene	0.08
Naphthalene	<0.2	Butylbenzylphthatlate	<0.2
4-Chloroaniline	<0.2	3,3-Dichlorobenzidine	<0.4
Hexachlorobutadiene	<0.2	Benzo(a)Anthracene	<0.2
4-Chloro-3-Methylphenol	<0.2	bis(2-Ethylhexyl)Phthalate	<0.2
2-Methylnaphthalene	<0.2	Chrysene	<0.2
Hexachlorocyclopentadiene	<0.2	Di-n-Octyl Phthalate	<0.2
2,4,6-Trichlorophenol	<0.2	Benzo(b)Fluoranthene	<0.2
2,4,5-Trichlorophenol	<0.2	Benzo(k)Fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(a)Pyrene	<0.2
2-Nitroaniline	<1	Indeno(1,2,3-cd)Pyrene	<0.2
Dimethyl Phthalate	<0.2	Dibenzo(a,h)Anthracene	<0.2
Acenaphthylene	0.1	Benzo(g,h,i)Perylene	<0.2
3-Nitroaniline	<1		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861009-55
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-08, 530 Ramirez Street (Water)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	<30	Acenaphthene	43
bis(-2-Chloroethyl)Ether	<30	2,4-Dinitrophenol	<140
2-Chlorophenol	<30	4-Nitrophenol	<140
1,3-Dichlorobenzene	<30	Dibenzofuran	<30
1,4-Dichlorobenzene	<30	2,4-Dinitrotoluene	<30
Benzyl Alcohol	<30	2,6-Dinitrotoluene	<30
1,2-Dichlorobenzene	<30	Diethylphthalate	<30
2-Methylphenol	<30	4-Chlorophenyl-phenylether	<30
bis(2-chloroisopropy1)Ether	<30	Fluorene	43
4-Methylphenol	<30	4-Nitroaniline	<140
N-Nitroso-Di-n-Propylamine	<30	4,6-Dinitro-2-Methylphenol	<140
Hexachloroethane	<30	N-Nitrosodiphenylamine (1)	<30
Nitrobenzene	<30	4-Bromophenyl-phenylether	<30
Isophorone	<30	Hexachlorobenzene	<30
2-Nitrophenol	<30	Pentachlorophenol	<140
2,4-Dimethylphenol	<30	Phenanthrene	58
Benzoic Acid	<140	Anthracene	14
bis(-2-Chloroethoxy)Methane	<30	Di-n-Butylphthalate	<30
2,4-Dichlorophenol	<30	Fluoranthene	12
1,2,4-Trichlorobenzene	<30	Pyrene	16
Naphthalene	45	Butylbenzylphthatlate	<30
4-Chloroaniline	<30	3,3-Dichlorobenzidine	<60
Hexachlorobutadiene	<30	Benzo(a)Anthracene	<30
4-Chloro-3-Methylphenol	<30	bis(2-Ethylhexyl)Phthalate	<30
2-Methylnaphthalene	<30	Chrysene	<30
Hexachlorocyclopentadiene	<30	Di-n-Octyl Phthalate	<30
2,4,6-Trichlorophenol	<30	Benzo(b)Fluoranthene	<30
2,4,5-Trichlorophenol	<30	Benzo(k)Fluoranthene	<30
2-Chloronaphthalene	<30	Benzo(a)Pyrene	<30
2-Nitroaniline	<140	Indeno(1,2,3-cd)Pyrene	<30
Dimethyl Phthalate	<30	Dibenzo(a,h)Anthracene	<30
Acenaphthylene	21	Benzo(g,h,i)Perylene	<30
3-Nitroaniline	<140		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861010-60
SAMPLING DATE: 10/09/86
DATE SAMPLE REC'D: 10/10/86
INVOICE NO.: 17883

Metro Rail Transit - 87-600-0002 - BH-08-60 - 530 Ramirez Street - Water

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Phenol	<30	Acenaphthene	37
bis(-2-Chloroethyl)Ether	<30	2,4-Dinitrophenol	<140
2-Chlorophenol	<30	4-Nitrophenol	<140
1,3-Dichlorobenzene	<30	Dibenzofuran	<30
1,4-Dichlorobenzene	<30	2,4-Dinitrotoluene	<30
Benzyl Alcohol	<30	2,6-Dinitrotoluene	<30
1,2-Dichlorobenzene	<30	Diethylphthalate	<30
2-Methylphenol	<30	4-Chlorophenyl-phenylether	<30
bis(2-chloroisopropy1)Ether	<30	Fluorene	42
4-Methylphenol	<30	4-Nitroaniline	<140
N-Nitroso-Di-n-Propylamine	<30	4,6-Dinitro-2-Methylphenol	<140
Hexachloroethane	<30	N-Nitrosodiphenylamine (1)	<30
Nitrobenzene	<30	4-Bromophenyl-phenylether	<30
Isophorone	<30	Hexachlorobenzene	<30
2-Nitrophenol	<30	Pentachlorophenol	<140
2,4-Dimethylphenol	<30	Phenanthrene	40
Benzoic Acid	<140	Anthracene	<30
bis(-2-Chloroethoxy)Methane	<30	Di-n-Butylphthalate	<30
2,4-Dichlorophenol	<30	Fluoranthene	<30
1,2,4-Trichlorobenzene	<30	Pyrene	16
Naphthalene	140	Butylbenzylphthatlate	<30
4-Chloroaniline	<30	3,3-Dichlorobenzidine	<60
Hexachlorobutadiene	<30	Benzo(a)Anthracene	<30
4-Chloro-3-Methylphenol	<30	bis(2-Ethylhexyl)Phthalate	<30
2-Methylnaphthalene	<30	Chrysene	<30
Hexachlorocyclopentadiene	<30	Di-n-Octyl Phthalate	<30
2,4,6-Trichlorophenol	<30	Benzo(b)Fluoranthene	<30
2,4,5-Trichlorophenol	<30	Benzo(k)Fluoranthene	<30
2-Chloronaphthalene	<30	Benzo(a)Pyrene	<30
2-Nitroaniline	<140	Indeno(1,2,3-cd)Pyrene	<30
Dimethyl Phthalate	<30	Dibenzo(a,h)Anthracene	<30
Acenaphthylene	27	Benzo(g,h,i)Perylene	<30
3-Nitroaniline	<140		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861121-55
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

Metro Rail Transit 86-600-0002 Field adjacent to center-BH-09-50 (water)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/l		mg/l
Phenol	<0.2	Acenaphthene	<0.2
bis(-2-Chloroethyl)Ether	<0.2	2,4-Dinitrophenol	<1
2-Chlorophenol	<0.2	4-Nitrophenol	<1
1,3-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,4-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<0.2
Benzyl Alcohol	<0.2	2,6-Dinitrotoluene	<0.2
1,2-Dichlorobenzene	<0.2	Diethylphthalate	<0.2
2-Methylphenol	<0.2	4-Chlorophenyl-phenylether	<0.2
bis(2-chloroisopropy1)Ether	<0.2	Fluorene	0.2
4-Methylphenol	<0.2	4-Nitroaniline	<1
N-Nitroso-Di-n-Propylamine	<0.2	4,6-Dinitro-2-Methylphenol	<1
Hexachloroethane	<0.2	N-Nitrosodiphenylamine (1)	<0.2
Nitrobenzene	<0.2	4-Bromophenyl-phenylether	<0.2
Isophorone	<0.2	Hexachlorobenzene	<0.2
2-Nitrophenol	<0.2	Pentachlorophenol	<1
2,4-Dimethylphenol	<0.2	Phenanthrene	0.7
Benzoic Acid	<1	Anthracene	0.1
bis(-2-Chloroethoxy)Methane	<0.2	Di-n-Butylphthalate	<0.2
2,4-Dichlorophenol	<0.2	Fluoranthene	<0.2
1,2,4-Trichlorobenzene	<0.2	Pyrene	0.5
Naphthalene	6.1	Butylbenzylphthatlate	<0.2
4-Chloroaniline	<0.2	3,3-Dichlorobenzidine	<0.4
Hexachlorobutadiene	<0.2	Benzo(a)Anthracene	<0.2
4-Chloro-3-Methylphenol	<0.2	bis(2-Ethylhexyl)Phthalate	<0.2
2-Methylnaphthalene	0.3	Chrysene	0.1
Hexachlorocyclopentadiene	<0.2	Di-n-Octyl Phthalate	<0.2
2,4,6-Trichlorophenol	<0.2	Benzo(b)Fluoranthene	<0.2
2,4,5-Trichlorophenol	<0.2	Benzo(k)Fluoranthene	<0.2
2-Chloronaphthalene	<0.2	Benzo(a)Pyrene	0.1
2-Nitroaniline	<1	Indeno(1,2,3-cd)Pyrene	<0.2
Dimethyl Phthalate	<0.2	Dibenzo(a,h)Anthracene	<0.2
Acenaphthylene	0.3	Benzo(g,h,i)Perylene	<0.2
3-Nitroaniline	<1		

<Denotes compound was not detected above the value indicated.

MH
ANALYST

R. J. Bentley
REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-53
SAMPLING DATE: 11/21/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-10-55 Ramirez St. (liquid)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/l		mg/l
Phenol	<0.2	Acenaphthene	<0.2
bis(-2-Chloroethyl)Ether	<0.2	2,4-Dinitrophenol	<1
2-Chlorophenol	<0.2	4-Nitrophenol	<1
1,3-Dichlorobenzene	<0.2	Dibenzofuran	<0.2
1,4-Dichlorobenzene	<0.2	2,4-Dinitrotoluene	<0.2
Benzyl Alcohol	<0.2	2,6-Dinitrotoluene	<0.2
1,2-Dichlorobenzene	<0.2	Diethylphthalate	<0.2
2-Methylphenol	<0.2	4-Chlorophenyl-phenylether	<0.2
bis(2-chloroisopropyl)Ether	<0.2	Fluorene	<0.2
4-Methylphenol	<0.2	4-Nitroaniline	<1
N-Nitroso-Di-n-Propylamine	<0.2	4,6-Dinitro-2-Methylphenol	<1
Hexachloroethane	<0.2	N-Nitrosodiphenylamine (1)	<0.2
Nitrobenzene	<0.2	4-Bromophenyl-phenylether	<0.2
Isophorone	<0.2	Hexachlorobenzene	<0.2
2-Nitrophenol	<0.2	Pentachlorophenol	<1
2,4-Dimethylphenol	<0.2	Phenanthrene	0.2
Benzoic Acid	<1	Anthracene	<0.2
bis(-2-Chloroethoxy)Methane	<0.2	Di-n-Butylphthalate	<0.2
2,4-Dichlorophenol	<0.2	Fluoranthene	0.1
1,2,4-Trichlorobenzene	<0.2	Pyrene	0.2
Naphthalene	0.9	Butylbenzylphthatlate	<0.2
4-Chloroaniline	<0.2	3,3-Dichlorobenzidine	<0.2
Hexachlorobutadiene	<0.2	Benzo(a)Anthracene	<0.2
4-Chloro-3-Methylphenol	<0.2	bis(2-Ethylhexyl)Phthalate	<0.2
2-Methylnaphthalene	0.06	Chrysene	0.1
Hexachlorocyclopentadiene	<0.2	Di-n-Octyl Phthalate	<0.2
2,4,6-Trichlorophenol	<0.2	Benzo(b)Fluoranthene	<0.2
2,4,5-Trichlorophenol	<0.2	Benzo(k)Fluoranthene	0.1
2-Chloronaphthalene	<0.2	Benzo(a)Pyrene	0.1
2-Nitroaniline	<1	Indeno(1,2,3-cd)Pyrene	<0.2
Dimethyl Phthalate	<0.2	Dibenzo(a,h)Anthracene	<0.2
Acenaphthylene	0.2	Benzo(g,h,i)Perylene	<0.2
3-Nitroaniline	<1		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-16
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-01-Soil BH-01-30

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<2.
2-Chlorophenol	<0.3	4-Nitrophenol	<2.
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropy1)Ether	<0.3	Fluorene	<0.3
4-Methylphenol	<0.3	4-Nitroaniline	<2.
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<2.
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<2.
2,4-Dimethylphenol	<0.3	Phenanthrene	<0.3
Benzoic Acid	<2.	Anthracene	<0.3
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	<0.3
2,4-Dichlorophenol	<0.3	Fluoranthene	<0.3
1,2,4-Trichlorobenzene	<0.3	Pyrene	<0.3
Naphthalene	<0.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	<0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	<0.3
2-Methylnaphthalene	<0.3	Chrysene	<0.3
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	<0.3
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	<0.3
2-Nitroaniline	<2.	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<2.		

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/16/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

Amended Report

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-13
SAMPLING DATE: 10/03/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-02-35 Soil

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<2.
2-Chlorophenol	<0.3	4-Nitrophenol	<2.
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropy1)Ether	<0.3	Fluorene	<0.3
4-Methylphenol	<0.3	4-Nitroaniline	<2.
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<2.
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<2.
2,4-Dimethylphenol	<0.3	Phenanthrene	<0.3
Benzoic Acid	<2.	Anthracene	<0.3
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	<0.3
2,4-Dichlorophenol	<0.3	Fluoranthene	<0.3
1,2,4-Trichlorobenzene	<0.3	Pyrene	<0.3
Naphthalene	<0.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	<0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	<0.3
2-Methylnaphthalene	<0.3	Chrysene	<0.3
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	<0.3
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	<0.3
2-Nitroaniline	<2.	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<2.		

MK
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861006-17
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-04-Soil BH-04-25

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<2.
2-Chlorophenol	<0.3	4-Nitrophenol	<2.
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropyl)Ether	<0.3	Fluorene	<0.3
4-Methylphenol	<0.3	4-Nitroaniline	<2.
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<2.
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<2.
2,4-Dimethylphenol	<0.3	Phenanthrene	0.5
Benzoic Acid	<2.	Anthracene	<0.3
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	<0.3
2,4-Dichlorophenol	<0.3	Fluoranthene	0.4
1,2,4-Trichlorobenzene	<0.3	Pyrene	0.8
Naphthalene	<0.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	<0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	<0.3
2-Methylnaphthalene	<0.3	Chrysene	<0.3
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	<0.3
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	<0.3
2-Nitroaniline	<2.	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<2.		

ANALYST

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CHEMICAL RESEARCH LABORATORIES
DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-55
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-05-35 Dennys (soil)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 5	Acenaphthene	< 5
bis(-2-Chloroethyl)Ether	< 5	2,4-Dinitrophenol	<20
2-Chlorophenol	< 5	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 5	Dibenzofuran	< 5
1,4-Dichlorobenzene	< 5	2,4-Dinitrotoluene	< 5
Benzyl Alcohol	< 5	2,6-Dinitrotoluene	< 5
1,2-Dichlorobenzene	< 5	Diethylphthalate	< 5
2-Methylphenol	< 5	4-Chlorophenyl-phenylether	< 5
bis(2-chloroisopropyl)Ether	< 5	Fluorene	< 5
4-Methylphenol	< 5	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 5	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 5	N-Nitrosodiphenylamine (1)	< 5
Nitrobenzene	< 5	4-Bromophenyl-phenylether	< 5
Isophorone	< 5	Hexachlorobenzene	< 5
2-Nitrophenol	< 5	Pentachlorophenol	<20
2,4-Dimethylphenol	< 5	Phenanthrene	3
Benzoic Acid	<20	Anthracene	< 5
bis(-2-Chloroethoxy)Methane	< 5	Di-n-Butylphthalate	< 5
2,4-Dichlorophenol	< 5	Fluoranthene	< 5
1,2,4-Trichlorobenzene	< 5	Pyrene	3
Naphthalene	< 5	Butylbenzylphthatlate	< 5
4-Chloroaniline	< 5	3,3-Dichlorobenzidine	<10
Hexachlorobutadiene	< 5	Benzo(a)Anthracene	< 5
4-Chloro-3-Methylphenol	< 5	bis(2-Ethylhexyl)Phthalate	< 5
2-Methylnaphthalene	< 5	Chrysene	< 5
Hexachlorocyclopentadiene	< 5	Di-n-Octyl Phthalate	< 5
2,4,6-Trichlorophenol	< 5	Benzo(b)Fluoranthene	< 5
2,4,5-Trichlorophenol	< 5	Benzo(k)Fluoranthene	< 5
2-Chloronaphthalene	< 5	Benzo(a)Pyrene	< 5
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	< 5
Dimethyl Phthalate	< 5	Dibenzo(a,h)Anthracene	< 5
Acenaphthylene	< 5	Benzo(g,h,i)Perylene	< 5
3-Nitroaniline	<20		

<Denotes compound was not detected above the value indicated

ANALYST

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DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-54
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-05-40 Dennys (soil)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 5	Acenaphthene	4
bis(-2-Chloroethyl)Ether	< 5	2,4-Dinitrophenol	<20
2-Chlorophenol	< 5	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 5	Dibenzofuran	< 5
1,4-Dichlorobenzene	< 5	2,4-Dinitrotoluene	< 5
Benzyl Alcohol	< 5	2,6-Dinitrotoluene	< 5
1,2-Dichlorobenzene	< 5	Diethylphthalate	< 5
2-Methylphenol	< 5	4-Chlorophenyl-phenylether	< 5
bis(2-chloroisopropyl)Ether	< 5	Fluorene	26
4-Methylphenol	< 5	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 5	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 5	N-Nitrosodiphenylamine (1)	< 5
Nitrobenzene	< 5	4-Bromophenyl-phenylether	< 5
Isophorone	< 5	Hexachlorobenzene	< 5
2-Nitrophenol	< 5	Pentachlorophenol	<20
2,4-Dimethylphenol	< 5	Phenanthrene	92
Benzoic Acid	<20	Anthracene	15
bis(-2-Chloroethoxy)Methane	< 5	Di-n-Butylphthalate	< 5
2,4-Dichlorophenol	< 5	Fluoranthene	46
1,2,4-Trichlorobenzene	< 5	Pyrene	70
Naphthalene	< 5	Butylbenzylphthatlate	< 5
4-Chloroaniline	< 5	3,3-Dichlorobenzidine	<10
Hexachlorobutadiene	< 5	Benzo(a)Anthracene	< 5
4-Chloro-3-Methylphenol	< 5	bis(2-Ethylhexyl)Phthalate	< 5
2-Methylnaphthalene	< 5	Chrysene	18
Hexachlorocyclopentadiene	< 5	Di-n-Octyl Phthalate	< 5
2,4,6-Trichlorophenol	< 5	Benzo(b)Fluoranthene	< 5
2,4,5-Trichlorophenol	< 5	Benzo(k)Fluoranthene	< 5
2-Chloronaphthalene	< 5	Benzo(a)Pyrene	18
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	13
Dimethyl Phthalate	< 5	Dibenzo(a,h)Anthracene	< 5
Acenaphthylene	38	Benzo(g,h,i)Perylene	20
3-Nitroaniline	<20		

<Denotes compound was not detected above the value indicated.

mf
ANALYST

R. J. Bentley
REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-56
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-05-45 Dennys (soil)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 5	Acenaphthene	< 5
bis(-2-Chloroethyl)Ether	< 5	2,4-Dinitrophenol	<20
2-Chlorophenol	< 5	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 5	Dibenzofuran	< 5
1,4-Dichlorobenzene	< 5	2,4-Dinitrotoluene	< 5
Benzyl Alcohol	< 5	2,6-Dinitrotoluene	< 5
1,2-Dichlorobenzene	< 5	Diethylphthalate	< 5
2-Methylphenol	< 5	4-Chlorophenyl-phenylether	< 5
bis(2-chloroisopropyl)Ether	< 5	Fluorene	< 5
4-Methylphenol	< 5	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 5	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 5	N-Nitrosodiphenylamine (1)	< 5
Nitrobenzene	< 5	4-Bromophenyl-phenylether	< 5
Isophorone	< 5	Hexachlorobenzene	< 5
2-Nitrophenol	< 5	Pentachlorophenol	<20
2,4-Dimethylphenol	< 5	Phenanthrene	6
Benzoic Acid	<20	Anthracene	< 5
bis(-2-Chloroethoxy)Methane	< 5	Di-n-Butylphthalate	< 5
2,4-Dichlorophenol	< 5	Fluoranthene	6
1,2,4-Trichlorobenzene	< 5	Pyrene	12
Naphthalene	< 5	Butylbenzylphthatlate	< 5
4-Chloroaniline	< 5	3,3-Dichlorobenzidine	<10
Hexachlorobutadiene	< 5	Benzo(a)Anthracene	< 5
4-Chloro-3-Methylphenol	< 5	bis(2-Ethylhexyl)Phthalate	< 5
2-Methylnaphthalene	< 5	Chrysene	< 5
Hexachlorocyclopentadiene	< 5	Di-n-Octyl Phthalate	< 5
2,4,6-Trichlorophenol	< 5	Benzo(b)Fluoranthene	< 5
2,4,5-Trichlorophenol	< 5	Benzo(k)Fluoranthene	< 5
2-Chloronaphthalene	< 5	Benzo(a)Pyrene	< 5
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	< 5
Dimethyl Phthalate	< 5	Dibenzo(a,h)Anthracene	< 5
Acenaphthylene	< 5	Benzo(g,h,i)Perylene	< 5
3-Nitroaniline	<20		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 860926-41
SAMPLING DATE: 09/25/86 12:00
DATE SAMPLE REC'D: 09/26/86
INVOICE NO.: 17691

Metro Rail Transit - #87-600-0001-0002 - BH-06-30 - 530 Ramirez Street

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.3	4-Nitrophenol	<1.5
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropy1)Ether	<0.3	Fluorene	<0.3
4-Methylphenol	<0.3	4-Nitroaniline	<1.5
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<1.5
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<1.5
2,4-Dimethylphenol	<0.3	Phenanthrene	<0.3
Benzoic Acid	<1.5	Anthracene	<0.3
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	0.7*
2,4-Dichlorophenol	<0.3	Fluoranthene	<0.3
1,2,4-Trichlorobenzene	<0.3	Pyrene	<0.3
Naphthalene	<0.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	<0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	<0.3
2-Methylnaphthalene	<0.3	Chrysene	<0.3
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	<0.3
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	<0.3
2-Nitroaniline	<1.5	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<1.5		

*Present in reagent blank.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Tan Phung

NATURE OF SAMPLE:

ANALYSIS NO.: 860929-29
SAMPLING DATE: 09/26/86 1:00
DATE SAMPLE REC'D: 09/29/86
INVOICE NO.: 17690

Metro Rail Transit - BH-06A-30 530 Ramirez

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.3	4-Nitrophenol	<1.5
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropy1)Ether	<0.3	Fluorene	<0.3
4-Methylphenol	<0.3	4-Nitroaniline	<1.5
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<1.5
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<1.5
2,4-Dimethylphenol	<0.3	Phenanthrene	<0.3
Benzoic Acid	<1.5	Anthracene	<0.3
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	0.7*
2,4-Dichlorophenol	<0.3	Fluoranthene	<0.3
1,2,4-Trichlorobenzene	<0.3	Pyrene	<0.3
Naphthalene	<0.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	<0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	0.7
2-Methylnaphthalene	<0.3	Chrysene	<0.3
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	<0.3
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	<0.3
2-Nitroaniline	<1.5	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<1.5		

*Present in reagent blank.

ANALYST

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CHEMICAL RESEARCH LABORATORIES

DATE 10/6/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861121-61
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

Metro Rail Transit 87-600-0002 - BH-07-30 - (soil)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<10.	Acenaphthene	<10.
bis(-2-Chloroethyl)Ether	<10.	2,4-Dinitrophenol	<50.
2-Chlorophenol	<10.	4-Nitrophenol	<50.
1,3-Dichlorobenzene	<10.	Dibenzofuran	<10.
1,4-Dichlorobenzene	<10.	2,4-Dinitrotoluene	<10.
Benzyl Alcohol	<10.	2,6-Dinitrotoluene	<10.
1,2-Dichlorobenzene	<10.	Diethylphthalate	<10.
2-Methylphenol	<10.	4-Chlorophenyl-phenylether	<10.
bis(2-chloroisopropy1)Ether	<10.	Fluorene	<10.
4-Methylphenol	<10.	4-Nitroaniline	<50.
N-Nitroso-Di-n-Propylamine	<10.	4,6-Dinitro-2-Methylphenol	<50.
Hexachloroethane	<10.	N-Nitrosodiphenylamine (1)	<10.
Nitrobenzene	<10.	4-Bromophenyl-phenylether	<10.
Isophorone	<10.	Hexachlorobenzene	<10.
2-Nitrophenol	<10.	Pentachlorophenol	<50.
2,4-Dimethylphenol	<10.	Phenanthrene	27.
Benzoic Acid	<50.	Anthracene	4.
bis(-2-Chloroethoxy)Methane	<10.	Di-n-Butylphthalate	<10.
2,4-Dichlorophenol	<10.	Fluoranthene	16.
1,2,4-Trichlorobenzene	<10.	Pyrene	28.
Naphthalene	<10.	Butylbenzylphthatlate	<10.
4-Chloroaniline	<10.	3,3-Dichlorobenzidine	<20.
Hexachlorobutadiene	<10.	Benzo(a)Anthracene	<10.
4-Chloro-3-Methylphenol	<10.	bis(2-Ethylhexyl)Phthalate	<10.
2-Methylnaphthalene	<10.	Chrysene	6.
Hexachlorocyclopentadiene	<10.	Di-n-Octyl Phthalate	<10.
2,4,6-Trichlorophenol	<10.	Benzo(b)Fluoranthene	3.
2,4,5-Trichlorophenol	<10.	Benzo(k)Fluoranthene	<10.
2-Chloronaphthalene	<10.	Benzo(a)Pyrene	6.
2-Nitroaniline	<50.	Indeno(1,2,3-cd)Pyrene	4.
Dimethyl Phthalate	<10.	Dibenzo(a,h)Anthracene	<10.
Acenaphthylene	10.	Benzo(g,h,i)Perylene	6.
3-Nitroaniline	<50.		

<Denotes compound was not detected above the value indicated.

MH
ANALYST

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CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861002-35
SAMPLING DATE: 10/01/86
DATE SAMPLE REC'D: 10/02/86
INVOICE NO.: 17689

NATURE OF SAMPLE:
Metro Rail Transit - #87-600-0001 - BH-08-15 - Ramirez St. & Howard

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	g/kg		g/kg
Phenol	<0.8	Acenaphthene	0.5
bis(-2-Chloroethyl)Ether	<0.8	2,4-Dinitrophenol	<4.
2-Chlorophenol	<0.8	4-Nitrophenol	<4.
1,3-Dichlorobenzene	<0.8	Dibenzofuran	<0.8
1,4-Dichlorobenzene	<0.8	2,4-Dinitrotoluene	<0.8
Benzyl Alcohol	<0.8	2,6-Dinitrotoluene	<0.8
1,2-Dichlorobenzene	<0.8	Diethylphthalate	<0.8
2-Methylphenol	<0.8	4-Chlorophenyl-phenylether	<0.8
bis(2-chloroisopropy1)Ether	<0.8	Fluorene	1.1
4-Methylphenol	<0.8	4-Nitroaniline	<4.
N-Nitroso-Di-n-Propylamine	<0.8	4,6-Dinitro-2-Methylphenol	<4.
Hexachloroethane	<0.8	N-Nitrosodiphenylamine (1)	<0.8
Nitrobenzene	<0.8	4-Bromophenyl-phenylether	<0.8
Isophorone	<0.8	Hexachlorobenzene	<0.8
2-Nitrophenol	<0.8	Pentachlorophenol	<4.
2,4-Dimethylphenol	<0.8	Phenanthrene	6.1
Benzoic Acid	<4.	Anthracene	0.7
bis(-2-Chloroethoxy)Methane	<0.8	Di-n-Butylphthalate	<0.8
2,4-Dichlorophenol	<0.8	Fluoranthene	5.2
1,2,4-Trichlorobenzene	<0.8	Pyrene	7.6
Naphthalene	14.	Butylbenzylphthatlate	<0.8
4-Chloroaniline	<0.8	3,3-Dichlorobenzidine	<2.
Hexachlorobutadiene	<0.8	Benzo(a)Anthracene	1.4
4-Chloro-3-Methylphenol	<0.8	bis(2-Ethylhexyl)Phthalate	<0.8
2-Methylnaphthalene	3.1	Chrysene	1.4
Hexachlorocyclopentadiene	<0.8	Di-n-Octyl Phthalate	<0.8
2,4,6-Trichlorophenol	<0.8	Benzo(b)Fluoranthene	1.
2,4,5-Trichlorophenol	<0.8	Benzo(k)Fluoranthene	1.1
2-Chloronaphthalene	<0.8	Benzo(a)Pyrene	2.1
2-Nitroaniline	<4.	Indeno(1,2,3-cd)Pyrene	2.
Dimethyl Phthalate	<0.8	Dibenzo(a,h)Anthracene	<0.8
Acenaphthylene	5.1	Benzo(g,h,i)Perylene	3.1
3-Nitroaniline	<4.		

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DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861009-56
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-08-30, 530 Ramirez Street

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 3	Acenaphthene	< 8
bis(-2-Chloroethyl)Ether	< 3	2,4-Dinitrophenol	<20
2-Chlorophenol	< 3	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 3	Dibenzofuran	< 3
1,4-Dichlorobenzene	< 3	2,4-Dinitrotoluene	< 3
Benzyl Alcohol	< 3	2,6-Dinitrotoluene	< 3
1,2-Dichlorobenzene	< 3	Diethylphthalate	< 3
2-Methylphenol	< 3	4-Chlorophenyl-phenylether	< 3
bis(2-chloroisopropy1)Ether	< 3	Fluorene	16
4-Methylphenol	< 3	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 3	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 3	N-Nitrosodiphenylamine (1)	< 3
Nitrobenzene	< 3	4-Bromophenyl-phenylether	< 3
Isophorone	< 3	Hexachlorobenzene	< 3
2-Nitrophenol	< 3	Pentachlorophenol	<20
2,4-Dimethylphenol	< 3	Phenanthrene	35
Benzoic Acid	<20	Anthracene	17
bis(-2-Chloroethoxy)Methane	< 3	Di-n-Butylphthalate	< 3
2,4-Dichlorophenol	< 3	Fluoranthene	24
1,2,4-Trichlorobenzene	< 3	Pyrene	36
Naphthalene	< 3	Butylbenzylphthatlate	< 3
4-Chloroaniline	< 3	3,3-Dichlorobenzidine	< 6
Hexachlorobutadiene	< 3	Benzo(a)Anthracene	13
4-Chloro-3-Methylphenol	< 3	bis(2-Ethylhexyl)Phthalate	< 3
2-Methylnaphthalene	< 3	Chrysene	16
Hexachlorocyclopentadiene	< 3	Di-n-Octyl Phthalate	< 3
2,4,6-Trichlorophenol	< 3	Benzo(b)Fluoranthene	7
2,4,5-Trichlorophenol	< 3	Benzo(k)Fluoranthene	< 3
2-Chloronaphthalene	< 3	Benzo(a)Pyrene	9
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	4
Dimethyl Phthalate	< 3	Dibenzo(a,h)Anthracene	< 3
Acenaphthylene	<12	Benzo(g,h,i)Perylene	4
3-Nitroaniline	<20		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861010-61
SAMPLING DATE: 10/09/86
DATE SAMPLE REC'D: 10/10/86
INVOICE NO.: 17883

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0002 - BH-08-60 - 530 Ramirez Street - Soil

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<2
2-Chlorophenol	<0.3	4-Nitrophenol	<2
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropy1)Ether	<0.3	Fluorene	0.1
4-Methylphenol	<0.3	4-Nitroaniline	<2
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<2
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<2
2,4-Dimethylphenol	<0.3	Phenanthrene	0.5
Benzoic Acid	<2	Anthracene	0.4
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	<0.3
2,4-Dichlorophenol	<0.3	Fluoranthene	0.9
1,2,4-Trichlorobenzene	<0.3	Pyrene	1.6
Naphthalene	10.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	<0.3
2-Methylnaphthalene	<0.3	Chrysene	0.4
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	0.2
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	0.2
2-Nitroaniline	<2	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<2		

<Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861009-57
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

Metro Rail Transit - 87-600-0001 - BH-08-45, 530 Ramirez Street

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<0.3	Acenaphthene	<0.3
bis(-2-Chloroethyl)Ether	<0.3	2,4-Dinitrophenol	<2
2-Chlorophenol	<0.3	4-Nitrophenol	<2
1,3-Dichlorobenzene	<0.3	Dibenzofuran	<0.3
1,4-Dichlorobenzene	<0.3	2,4-Dinitrotoluene	<0.3
Benzyl Alcohol	<0.3	2,6-Dinitrotoluene	<0.3
1,2-Dichlorobenzene	<0.3	Diethylphthalate	<0.3
2-Methylphenol	<0.3	4-Chlorophenyl-phenylether	<0.3
bis(2-chloroisopropy1)Ether	<0.3	Fluorene	<0.3
4-Methylphenol	<0.3	4-Nitroaniline	<2
N-Nitroso-Di-n-Propylamine	<0.3	4,6-Dinitro-2-Methylphenol	<2
Hexachloroethane	<0.3	N-Nitrosodiphenylamine (1)	<0.3
Nitrobenzene	<0.3	4-Bromophenyl-phenylether	<0.3
Isophorone	<0.3	Hexachlorobenzene	<0.3
2-Nitrophenol	<0.3	Pentachlorophenol	<2
2,4-Dimethylphenol	<0.3	Phenanthrene	<0.3
Benzoic Acid	<2	Anthracene	<0.3
bis(-2-Chloroethoxy)Methane	<0.3	Di-n-Butylphthalate	0.7
2,4-Dichlorophenol	<0.3	Fluoranthene	0.2
1,2,4-Trichlorobenzene	<0.3	Pyrene	0.3
Naphthalene	<0.3	Butylbenzylphthatlate	<0.3
4-Chloroaniline	<0.3	3,3-Dichlorobenzidine	<0.6
Hexachlorobutadiene	<0.3	Benzo(a)Anthracene	<0.3
4-Chloro-3-Methylphenol	<0.3	bis(2-Ethylhexyl)Phthalate	0.7
2-Methylnaphthalene	<0.3	Chrysene	<0.3
Hexachlorocyclopentadiene	<0.3	Di-n-Octyl Phthalate	<0.3
2,4,6-Trichlorophenol	<0.3	Benzo(b)Fluoranthene	<0.3
2,4,5-Trichlorophenol	<0.3	Benzo(k)Fluoranthene	<0.3
2-Chloronaphthalene	<0.3	Benzo(a)Pyrene	<0.3
2-Nitroaniline	<2	Indeno(1,2,3-cd)Pyrene	<0.3
Dimethyl Phthalate	<0.3	Dibenzo(a,h)Anthracene	<0.3
Acenaphthylene	<0.3	Benzo(g,h,i)Perylene	<0.3
3-Nitroaniline	<2		

<Denotes compound was not detected above the value indicated.

ANALYST

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CHEMICAL RESEARCH LABORATORIES

DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861121-56
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

Metro Rail Transit 86-600-0002 Field adjacent to center-BH-09-30 (solids)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	<10.	Acenaphthene	43.
bis(-2-Chloroethyl)Ether	<10.	2,4-Dinitrophenol	<50.
2-Chlorophenol	<10.	4-Nitrophenol	<50.
1,3-Dichlorobenzene	<10.	Dibenzofuran	5.
1,4-Dichlorobenzene	<10.	2,4-Dinitrotoluene	<10.
Benzyl Alcohol	<10.	2,6-Dinitrotoluene	<10.
1,2-Dichlorobenzene	<10.	Diethylphthalate	<10.
2-Methylphenol	<10.	4-Chlorophenyl-phenylether	<10.
bis(2-chloroisopropyl)Ether	<10.	Fluorene	41.
4-Methylphenol	<10.	4-Nitroaniline	<50.
N-Nitroso-Di-n-Propylamine	<10.	4,6-Dinitro-2-Methylphenol	<50.
Hexachloroethane	<10.	N-Nitrosodiphenylamine (1)	<10.
Nitrobenzene	<10.	4-Bromophenyl-phenylether	<10.
Isophorone	<10.	Hexachlorobenzene	<10.
2-Nitrophenol	<10.	Pentachlorophenol	<50.
2,4-Dimethylphenol	<10.	Phenanthrene	120.
Benzoic Acid	<50.	Anthracene	28.
bis(-2-Chloroethoxy)Methane	<10.	Di-n-Butylphthalate	<10.
2,4-Dichlorophenol	<10.	Fluoranthene	69.
1,2,4-Trichlorobenzene	<10.	Pyrene	159.
Naphthalene	220.	Butylbenzylphthatlate	<10.
4-Chloroaniline	<10.	3,3-Dichlorobenzidine	<20.
Hexachlorobutadiene	<10.	Benzo(a)Anthracene	<10.
4-Chloro-3-Methylphenol	<10.	bis(2-Ethylhexyl)Phthalate	<10.
2-Methylnaphthalene	56.	Chrysene	34.
Hexachlorocyclopentadiene	<10.	Di-n-Octyl Phthalate	<10.
2,4,6-Trichlorophenol	<10.	Benzo(b)Fluoranthene	<10.
2,4,5-Trichlorophenol	<10.	Benzo(k)Fluoranthene	<10.
2-Chloronaphthalene	<10.	Benzo(a)Pyrene	34.
2-Nitroaniline	<50.	Indeno(1,2,3-cd)Pyrene	26.
Dimethyl Phthalate	<10.	Dibenzo(a,h)Anthracene	5.
Acenaphthylene	63.	Benzo(g,h,i)Perylene	38.
3-Nitroaniline	<50.		

<Denotes compound was not detected above the value indicated.

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ANALYST

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CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861121-57
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

Metro Rail Transit 86-600-0002 Field adjacent to center-BH-09-50 (solids)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 5	Acenaphthene	< 5
bis(-2-Chloroethyl)Ether	< 5	2,4-Dinitrophenol	<20
2-Chlorophenol	< 5	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 5	Dibenzofuran	< 5
1,4-Dichlorobenzene	< 5	2,4-Dinitrotoluene	< 5
Benzyl Alcohol	< 5	2,6-Dinitrotoluene	< 5
1,2-Dichlorobenzene	< 5	Diethylphthalate	< 5
2-Methylphenol	< 5	4-Chlorophenyl-phenylether	< 5
bis(2-chloroisopropy1)Ether	< 5	Fluorene	< 5
4-Methylphenol	< 5	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 5	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 5	N-Nitrosodiphenylamine (1)	< 5
Nitrobenzene	< 5	4-Bromophenyl-phenylether	< 5
Isophorone	< 5	Hexachlorobenzene	< 5
2-Nitrophenol	< 5	Pentachlorophenol	<20
2,4-Dimethylphenol	< 5	Phenanthrene	< 5
Benzoic Acid	<20	Anthracene	< 5
bis(-2-Chloroethoxy)Methane	< 5	Di-n-Butylphthalate	< 5
2,4-Dichlorophenol	< 5	Fluoranthene	< 5
1,2,4-Trichlorobenzene	< 5	Pyrene	4
Naphthalene	< 5	Butylbenzylphthatlate	< 5
4-Chloroaniline	< 5	3,3-Dichlorobenzidine	<10
Hexachlorobutadiene	< 5	Benzo(a)Anthracene	< 5
4-Chloro-3-Methylphenol	< 5	bis(2-Ethylhexyl)Phthalate	< 5
2-Methylnaphthalene	< 5	Chrysene	< 5
Hexachlorocyclopentadiene	< 5	Di-n-Octyl Phthalate	< 5
2,4,6-Trichlorophenol	< 5	Benzo(b)Fluoranthene	< 5
2,4,5-Trichlorophenol	< 5	Benzo(k)Fluoranthene	< 5
2-Chloronaphthalene	< 5	Benzo(a)Pyrene	< 5
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	< 5
Dimethyl Phthalate	< 5	Dibenzo(a,h)Anthracene	< 5
Acenaphthylene	< 5	Benzo(g,h,i)Perylene	< 5
3-Nitroaniline	<20		

<Denotes compound was not detected above the value indicated.

MH
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861125-52
SAMPLING DATE: 11/21/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 - BH-10-35 Ramirez St. (soil)

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 5	Acenaphthene	< 5
bis(-2-Chloroethyl)Ether	< 5	2,4-Dinitrophenol	<20
2-Chlorophenol	< 5	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 5	Dibenzofuran	< 5
1,4-Dichlorobenzene	< 5	2,4-Dinitrotoluene	< 5
Benzyl Alcohol	< 5	2,6-Dinitrotoluene	< 5
1,2-Dichlorobenzene	< 5	Diethylphthalate	< 5
2-Methylphenol	< 5	4-Chlorophenyl-phenylether	< 5
bis(2-chloroisopropy1)Ether	< 5	Fluorene	< 5
4-Methylphenol	< 5	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 5	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 5	N-Nitrosodiphenylamine (1)	< 5
Nitrobenzene	< 5	4-Bromophenyl-phenylether	< 5
Isophorone	< 5	Hexachlorobenzene	< 5
2-Nitrophenol	< 5	Pentachlorophenol	<20
2,4-Dimethylphenol	< 5	Phenanthrene	< 5
Benzoic Acid	<20	Anthracene	< 5
bis(-2-Chloroethoxy)Methane	< 5	Di-n-Butylphthalate	< 5
2,4-Dichlorophenol	< 5	Fluoranthene	< 5
1,2,4-Trichlorobenzene	< 5	Pyrene	< 5
Naphthalene	< 5	Butylbenzylphthatlate	< 5
4-Chloroaniline	< 5	3,3-Dichlorobenzidine	<10
Hexachlorobutadiene	< 5	Benzo(a)Anthracene	< 5
4-Chloro-3-Methylphenol	< 5	bis(2-Ethylhexyl)Phthalate	< 5
2-Methylnaphthalene	< 5	Chrysene	< 5
Hexachlorocyclopentadiene	< 5	Di-n-Octyl Phthalate	< 5
2,4,6-Trichlorophenol	< 5	Benzo(b)Fluoranthene	< 5
2,4,5-Trichlorophenol	< 5	Benzo(k)Fluoranthene	< 5
2-Chloronaphthalene	< 5	Benzo(a)Pyrene	< 5
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	< 5
Dimethyl Phthalate	< 5	Dibenzo(a,h)Anthracene	< 5
Acenaphthylene	< 5	Benzo(g,h,i)Perylene	< 5
3-Nitroaniline	<20		

<Denotes compound was not detected above the value indicated.

MH
ANALYST

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CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861014-27
SAMPLING DATE: 10/10/86 10:52 AM
DATE SAMPLE REC'D: 10/14/86
INVOICE NO.: 17934

Metrorail 87-600-0002 - BH-11-25 - 550 Ramirez Street - Soil

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 30	Acenaphthene	< 30
bis(-2-Chloroethyl)Ether	< 30	2,4-Dinitrophenol	<200
2-Chlorophenol	< 30	4-Nitrophenol	<200
1,3-Dichlorobenzene	< 30	Dibenzofuran	< 30
1,4-Dichlorobenzene	< 30	2,4-Dinitrotoluene	< 30
Benzyl Alcohol	< 30	2,6-Dinitrotoluene	< 30
1,2-Dichlorobenzene	< 30	Diethylphthalate	< 30
2-Methylphenol	< 30	4-Chlorophenyl-phenylether	< 30
bis(2-chloroisopropyl)Ether	< 30	Fluorene	< 30
4-Methylphenol	< 30	4-Nitroaniline	<200
N-Nitroso-Di-n-Propylamine	< 30	4,6-Dinitro-2-Methylphenol	<200
Hexachloroethane	< 30	N-Nitrosodiphenylamine (1)	< 30
Nitrobenzene	< 30	4-Bromophenyl-phenylether	< 30
Isophorone	< 30	Hexachlorobenzene	< 30
2-Nitrophenol	< 30	Pentachlorophenol	<200
2,4-Dimethylphenol	< 30	Phenanthrene	< 30
Benzoic Acid	<200	Anthracene	< 30
bis(-2-Chloroethoxy)Methane	< 30	Di-n-Butylphthalate	< 30
2,4-Dichlorophenol	< 30	Fluoranthene	< 30
1,2,4-Trichlorobenzene	< 30	Pyrene	< 30
Naphthalene	119	Butylbenzylphthatlate	< 30
4-Chloroaniline	< 30	3,3-Dichlorobenzidine	< 60
Hexachlorobutadiene	< 30	Benzo(a)Anthracene	< 30
4-Chloro-3-Methylphenol	< 30	bis(2-Ethylhexyl)Phthalate	< 30
2-Methylnaphthalene	< 30	Chrysene	< 30
Hexachlorocyclopentadiene	< 30	Di-n-Octyl Phthalate	< 30
2,4,6-Trichlorophenol	< 30	Benzo(b)Fluoranthene	< 30
2,4,5-Trichlorophenol	< 30	Benzo(k)Fluoranthene	< 30
2-Chloronaphthalene	< 30	Benzo(a)Pyrene	< 30
2-Nitroaniline	<200	Indeno(1,2,3-cd)Pyrene	< 30
Dimethyl Phthalate	< 30	Dibenzo(a,h)Anthracene	< 30
Acenaphthylene	< 30	Benzo(g,h,i)Perylene	< 30
3-Nitroaniline	<200		

ANALYST

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CHEMICAL RESEARCH LABORATORIES

DATE 11/3/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861014-26
SAMPLING DATE: 10/10/86 11:09 AM
DATE SAMPLE REC'D: 10/14/86
INVOICE NO.: 17934

Metrorail 87-600-0002 - BH-11-30 - 550 Ramirez Street - Soil

EPA METHODS 625/8270 SEMI-VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Phenol	< 3	Acenaphthene	1
bis(-2-Chloroethyl)Ether	< 3	2,4-Dinitrophenol	<20
2-Chlorophenol	< 3	4-Nitrophenol	<20
1,3-Dichlorobenzene	< 3	Dibenzofuran	< 3
1,4-Dichlorobenzene	< 3	2,4-Dinitrotoluene	< 3
Benzyl Alcohol	< 3	2,6-Dinitrotoluene	< 3
1,2-Dichlorobenzene	< 3	Diethylphthalate	< 3
2-Methylphenol	< 3	4-Chlorophenyl-phenylether	< 3
bis(2-chloroisopropy1)Ether	< 3	Fluorene	< 3
4-Methylphenol	< 3	4-Nitroaniline	<20
N-Nitroso-Di-n-Propylamine	< 3	4,6-Dinitro-2-Methylphenol	<20
Hexachloroethane	< 3	N-Nitrosodiphenylamine (1)	< 3
Nitrobenzene	< 3	4-Bromophenyl-phenylether	< 3
Isophorone	< 3	Hexachlorobenzene	< 3
2-Nitrophenol	< 3	Pentachlorophenol	<20
2,4-Dimethylphenol	< 3	Phenanthrene	3
Benzoic Acid	<20	Anthracene	< 3
bis(-2-Chloroethoxy)Methane	< 3	Di-n-Butylphthalate	< 3
2,4-Dichlorophenol	< 3	Fluoranthene	2
1,2,4-Trichlorobenzene	< 3	Pyrene	2
Naphthalene	17	Butylbenzylphthatlate	< 3
4-Chloroaniline	< 3	3,3-Dichlorobenzidine	< 6
Hexachlorobutadiene	< 3	Benzo(a)Anthracene	< 3
4-Chloro-3-Methylphenol	< 3	bis(2-Ethylhexyl)Phthalate	< 3
2-Methylnaphthalene	2	Chrysene	< 3
Hexachlorocyclopentadiene	< 3	Di-n-Octyl Phthalate	< 3
2,4,6-Trichlorophenol	< 3	Benzo(b)Fluoranthene	< 3
2,4,5-Trichlorophenol	< 3	Benzo(k)Fluoranthene	< 3
2-Chloronaphthalene	< 3	Benzo(a)Pyrene	< 3
2-Nitroaniline	<20	Indeno(1,2,3-cd)Pyrene	< 3
Dimethyl Phthalate	< 3	Dibenzo(a,h)Anthracene	< 3
Acenaphthylene	< 3	Benzo(g,h,i)Perylene	< 3
3-Nitroaniline	<20		

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 11/3/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-15
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-01 Water BH-01-30

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	12*	1,1,2-Trichloroethane	< 5
Acetone	21*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	12*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

Amended Report

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-12
SAMPLING DATE: 10/03/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-02-35 Water

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	16*	1,1,2-Trichloroethane	< 5
Acetone	16*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	12*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861006-14
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

Metro Rail Transit - 87-600-0001 - BH-04 Water BH-04-57

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	14*	1,1,2-Trichloroethane	< 5
Acetone	18*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10-14-86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-57
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-05-45 Dennys (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	21 *	1,1,2-Trichloroethane	< 5
Acetone	42 *	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	7 *	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	6
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* Compound present in laboratory blanks

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 860926-42
SAMPLING DATE: 09/25/86 3:00
DATE SAMPLE REC'D: 09/26/86
INVOICE NO.: 17691

Metro Rail Transit #87-600-0001/0002 - BH-06-55 - 530 Ramirez Street

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg		ug/kg
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	< 5	1,1,2-Trichloroethane	< 5
Acetone	15*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	113
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	6

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Tan Phung

NATURE OF SAMPLE:

Metro Rail Transit - BH-06A-35 530 Ramirez

ANALYSIS NO.: 860929-30
SAMPLING DATE: 09/26/86 1:30
DATE SAMPLE REC'D: 09/29/86
INVOICE NO.: 17690

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	11*	1,1,2-Trichloroethane	< 5
Acetone	15*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/10/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-62
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 - BH-07-50 (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	< 5	Dibromochloromethane	< 5
Methylene Chloride	27 *	1,1,2-Trichloroethane	< 5
Acetone	34 *	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* Compound present in reagent blanks

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861009-55
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

Metro Rail Transit - 87-600-0001 - BH-08, 530 Ramirez Street water
-43.5

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l			ug/l
Chloromethane	<10		1,2-Dichloropropane	< 5
Bromomethane	<10		Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10		Trichloroethene	< 5
Chloroethane	<10		Dibromochloromethane	< 5
Methylene Chloride	14	*	1,1,2-Trichloroethane	< 5
Acetone	13	*	Benzene	< 5
Carbon Disulfide	< 5		cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5		2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5		Bromoform	< 5
Trans-1,2-Dichloroethene	< 5		4-Methyl-2-Pentanone	<10
Chloroform	< 5		2-Hexanone	<10
1,2-Dichloroethane	< 5		Tetrachloroethene	< 5
2-Butanone	<10		1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5		Toluene	< 5
Carbon Tetrachloride	< 5		Chlorobenzene	< 5
Vinyl Acetate	<10		Ethylbenzene	230
Bromodichloromethane	< 5		Styrene	< 5
			Total Xylenes	41

< Denotes compound was not detected above the value indicated.

* Can be attributed to laboratory contamination.

MH
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861010-60
SAMPLING DATE: 10/09/86
DATE SAMPLE REC'D: 10/10/86
INVOICE NO.: 17883

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0002 - BH-08-60, 530 Ramirez Street - Water

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l			ug/l
Chloromethane	<10		1,2-Dichloropropane	< 5
Bromomethane	<10		Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10		Trichloroethene	< 5
Chloroethane	<10		Dibromochloromethane	< 5
Methylene Chloride	9	*	1,1,2-Trichloroethane	< 5
Acetone	33	*	Benzene	< 5
Carbon Disulfide	< 5		cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5		2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5		Bromoform	< 5
Trans-1,2-Dichloroethene	< 5		4-Methyl-2-Pentanone	<10
Chloroform	< 5		2-Hexanone	<10
1,2-Dichloroethane	< 5		Tetrachloroethene	< 5
2-Butanone	<10		1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	6	*	Toluene	6
Carbon Tetrachloride	< 5		Chlorobenzene	< 5
Vinyl Acetate	<10		Ethylbenzene	500
Bromodichloromethane	< 5		Styrene	< 5
			Total Xylenes	163

< Denotes compound was not detected above the value indicated.

* Can be attributed to laboratory contamination.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-55
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

NATURE OF SAMPLE:

Metro Rail Transit 86-600-0002 Field adjacent to center-BH-09-50 (water)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	17 *	1,1,2-Trichloroethane	< 5
Acetone	230	Benzene	550
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	110
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	26
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	330

* Also found in laboratory blank

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-53
SAMPLING DATE: 11/21/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-10-55 Ramirez St. (liquid)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/l		ug/l
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	< 5	1,1,2-Trichloroethane	< 5
Acetone	310	Benzene	16
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinyl ether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	< 5	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861006-16
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-01 Soil BH-01-30

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg		ug/kg
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	43*	1,1,2-Trichloroethane	< 5
Acetone	17*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	10*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

Amended Report

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-02-35 Soil

ANALYSIS NO.: 861006-13
SAMPLING DATE: 10/03/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg		ug/kg
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	47*	1,1,2-Trichloroethane	< 5
Acetone	26*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	13*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

MH
ANALYST

R. J. Bandy
REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861006-17
SAMPLING DATE: 09/06/86
DATE SAMPLE REC'D: 10/06/86
INVOICE NO.: 17728

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-04 Soil BH-04-25

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg		ug/kg
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	41*	1,1,2-Trichloroethane	< 5
Acetone	23*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	11*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861125-55
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 - BH-05-35 Dennys (soil)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<0.5	1,2-Dichloropropane	<0.2
Bromomethane	<0.5	Trans-1,3-Dichloropropene	<0.2
Vinyl Chloride	<0.5	Trichloroethene	<0.2
Chloroethane	<0.5	Dibromochloromethane	<0.2
Methylene Chloride	<0.2	1,1,2-Trichloroethane	<0.2
Acetone	<0.5	Benzene	<0.2
Carbon Disulfide	<0.2	cis-1,3-Dichloropropene	<0.2
1,1-Dichloroethene	<0.2	2-Chloroethylvinyl ether	<0.5
1,1-Dichloroethane	<0.2	Bromoform	<0.2
Trans-1,2-Dichloroethene	<0.2	4-Methyl-2-Pentanone	<0.5
Chloroform	<0.2	2-Hexanone	<0.5
1,2-Dichloroethane	<0.2	Tetrachloroethene	<0.2
2-Butanone	<0.5	1,1,2,2-Tetrachloroethane	<0.2
1,1,1-Trichloroethane	<0.2	Toluene	<0.2
Carbon Tetrachloride	<0.2	Chlorobenzene	<0.2
Vinyl Acetate	<0.5	Ethylbenzene	<0.2
Bromodichloromethane	<0.2	Styrene	<0.2
		Total Xylenes	<0.2

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/7/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-54
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-05-40 Dennys (soil)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	< 5	1,2-Dichloropropane	< 2
Bromomethane	< 5	Trans-1,3-Dichloropropene	< 2
Vinyl Chloride	< 5	Trichloroethene	< 2
Chloroethane	< 5	Dibromochloromethane	< 2
Methylene Chloride	< 2	1,1,2-Trichloroethane	< 2
Acetone	< 5	Benzene	< 2
Carbon Disulfide	< 2	cis-1,3-Dichloropropene	< 2
1,1-Dichloroethene	< 2	2-Chloroethylvinyl ether	< 5
1,1-Dichloroethane	< 2	Bromoform	< 2
Trans-1,2-Dichloroethene	< 2	4-Methyl-2-Pentanone	< 5
Chloroform	< 2	2-Hexanone	< 5
1,2-Dichloroethane	< 2	Tetrachloroethene	< 2
2-Butanone	< 5	1,1,2,2-Tetrachloroethane	< 2
1,1,1-Trichloroethane	< 2	Toluene	< 2
Carbon Tetrachloride	< 2	Chlorobenzene	< 2
Vinyl Acetate	< 5	Ethylbenzene	< 2
Bromodichloromethane	< 2	Styrene	< 2
		Total Xylenes	< 2

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861125-56
SAMPLING DATE: 11/24/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 - BH-05-45 Dennys (soil)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<0.5	1,2-Dichloropropane	<0.2
Bromomethane	<0.5	Trans-1,3-Dichloropropene	<0.2
Vinyl Chloride	<0.5	Trichloroethene	<0.2
Chloroethane	<0.5	Dibromochloromethane	<0.2
Methylene Chloride	<0.2	1,1,2-Trichloroethane	<0.2
Acetone	<0.5	Benzene	<0.2
Carbon Disulfide	<0.2	cis-1,3-Dichloropropene	<0.2
1,1-Dichloroethene	<0.2	2-Chloroethylvinyl ether	<0.5
1,1-Dichloroethane	<0.2	Bromoform	<0.2
Trans-1,2-Dichloroethene	<0.2	4-Methyl-2-Pentanone	<0.5
Chloroform	<0.2	2-Hexanone	<0.5
1,2-Dichloroethane	<0.2	Tetrachloroethene	<0.2
2-Butanone	<0.5	1,1,2,2-Tetrachloroethane	<0.2
1,1,1-Trichloroethane	<0.2	Toluene	<0.2
Carbon Tetrachloride	<0.2	Chlorobenzene	<0.2
Vinyl Acetate	<0.5	Ethylbenzene	0.3
Bromodichloromethane	<0.2	Styrene	<0.2
		Total Xylenes	<0.2

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Tan Phung

NATURE OF SAMPLE:

Metro Rail Transit - BH-06A-30 530 Ramirez

ANALYSIS NO.: 860929-29
SAMPLING DATE: 09/26/86 1:00
DATE SAMPLE REC'D: 09/29/86
INVOICE NO.: 17690

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg		ug/kg
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	30*	1,1,2-Trichloroethane	< 5
Acetone	14*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	6*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/10/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 860926-41
SAMPLING DATE: 09/25/86 12:00
DATE SAMPLE REC'D: 09/26/86
INVOICE NO.: 17691

Metro Rail Transit #87-600-0001/0002 - BH-06-30 - 530 Ramirez Street

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg		ug/kg
Chloromethane	<10	1,2-Dichloropropane	< 5
Bromomethane	<10	Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10	Trichloroethene	< 5
Chloroethane	<10	Dibromochloromethane	< 5
Methylene Chloride	63*	1,1,2-Trichloroethane	< 5
Acetone	35*	Benzene	< 5
Carbon Disulfide	< 5	cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5	2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5	Bromoform	< 5
Trans-1,2-Dichloroethene	< 5	4-Methyl-2-Pentanone	<10
Chloroform	35*	2-Hexanone	<10
1,2-Dichloroethane	< 5	Tetrachloroethene	< 5
2-Butanone	<10	1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5	Toluene	< 5
Carbon Tetrachloride	< 5	Chlorobenzene	< 5
Vinyl Acetate	<10	Ethylbenzene	< 5
Bromodichloromethane	< 5	Styrene	< 5
		Total Xylenes	< 5

* At a concentration that can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-61
SAMPLING DATE: 11/20/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18510

NATURE OF SAMPLE:

Metro Rail Transit 87-600-0002 - BH-07-30 (soil)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<0.5	1,2-Dichloropropane	<0.2
Bromomethane	<0.5	Trans-1,3-Dichloropropene	<0.2
Vinyl Chloride	<0.5	Trichloroethene	<0.2
Chloroethane	<0.5	Dibromochloromethane	<0.2
Methylene Chloride	<0.2	1,1,2-Trichloroethane	<0.2
Acetone	<0.5	Benzene	<0.2
Carbon Disulfide	<0.2	cis-1,3-Dichloropropene	<0.2
1,1-Dichloroethene	<0.2	2-Chloroethylvinyl ether	<0.5
1,1-Dichloroethane	<0.2	Bromoform	<0.2
Trans-1,2-Dichloroethene	<0.2	4-Methyl-2-Pentanone	<0.5
Chloroform	<0.2	2-Hexanone	<0.5
1,2-Dichloroethane	<0.2	Tetrachloroethene	<0.2
2-Butanone	<0.5	1,1,2,2-Tetrachloroethane	<0.2
1,1,1-Trichloroethane	<0.2	Toluene	0.3
Carbon Tetrachloride	<0.2	Chlorobenzene	<0.2
Vinyl Acetate	<0.5	Ethylbenzene	6.9
Bromodichloromethane	<0.2	Styrene	<0.2
		Total Xylenes	1.2

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861002-35
SAMPLING DATE: 10/01/86
DATE SAMPLE REC'D: 10/02/86
INVOICE NO.: 17690

Metro Rail Transit - #87-600-0001 - BH-08-15 Ramirez St. & Howard

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<40	1,2-Dichloropropane	<20
Bromomethane	<40	Trans-1,3-Dichloropropene	<20
Vinyl Chloride	<40	Trichloroethene	<20
Chloroethane	<40	Dibromochloromethane	<20
Methylene Chloride	<20*	1,1,2-Trichloroethane	<20
Acetone	<40	Benzene	40
Carbon Disulfide	<20	cis-1,3-Dichloropropene	<20
1,1-Dichloroethene	<20	2-Chloroethylvinylether	<40
1,1-Dichloroethane	<20	Bromoform	<20
Trans-1,2-Dichloroethene	<20	4-Methyl-2-Pentanone	<40
Chloroform	<20	2-Hexanone	<40
1,2-Dichloroethane	<20	Tetrachloroethene	<20
2-Butanone	<40	1,1,2,2-Tetrachloroethane	<20
1,1,1-Trichloroethane	<20	Toluene	42
Carbon Tetrachloride	<20	Chlorobenzene	<20
Vinyl Acetate	<40	Ethylbenzene	<20
Bromodichloromethane	<20	Styrene	130
		Total Xylenes	85

* Denotes compound was background subtracted (1 x Bachgrount Amt.)

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact, with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/7/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861009-56
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-08-30, 30 Ramirez Street

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg			ug/kg
Chloromethane	<60		1,2-Dichloropropane	<30
Bromomethane	<60		Trans-1,3-Dichloropropene	<30
Vinyl Chloride	<60		Trichloroethene	<30
Chloroethane	<60		Dibromochloromethane	<30
Methylene Chloride	120	*	1,1,2-Trichloroethane	<30
Acetone	<60		Benzene	<30
Carbon Disulfide	<30		cis-1,3-Dichloropropene	<30
1,1-Dichloroethene	<30		2-Chloroethylvinylether	<60
1,1-Dichloroethane	<30		Bromoform	<30
Trans-1,2-Dichloroethene	<30		4-Methyl-2-Pentanone	<60
Chloroform	100	*	2-Hexanone	<60
1,2-Dichloroethane	<30		Tetrachloroethene	<30
2-Butanone	<60		1,1,2,2-Tetrachloroethane	<30
1,1,1-Trichloroethane	<30		Toluene	<30
Carbon Tetrachloride	<30		Chlorobenzene	<30
Vinyl Acetate	<60		Ethylbenzene	680
Bromodichloromethane	<30		Styrene	<30
			Total Xylenes	143

< Denotes compound was not detected above the value indicated.

* Can be attributed to laboratory contamination.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861009-57
SAMPLING DATE: 10/08/86
DATE SAMPLE REC'D: 10/09/86
INVOICE NO.: 17890

NATURE OF SAMPLE:

Metro Rail Transit - 87-600-0001 - BH-08-45, 530 Ramirez Street

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg			ug/kg
Chloromethane	<10		1,2-Dichloropropane	< 5
Bromomethane	<10		Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10		Trichloroethene	< 5
Chloroethane	<10		Dibromochloromethane	< 5
Methylene Chloride	20	*	1,1,2-Trichloroethane	< 5
Acetone	30	*	Benzene	< 5
Carbon Disulfide	< 5		cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5		2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5		Bromoform	< 5
Trans-1,2-Dichloroethene	< 5		4-Methyl-2-Pentanone	<10
Chloroform	< 5		2-Hexanone	<10
1,2-Dichloroethane	< 5		Tetrachloroethene	< 5
2-Butanone	<10		1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5		Toluene	< 5
Carbon Tetrachloride	< 5		Chlorobenzene	< 5
Vinyl Acetate	<10		Ethylbenzene	< 5
Bromodichloromethane	< 5		Styrene	< 5
			Total Xylenes	< 5

< Denotes compound was not detected above the value indicated.

* Can be attributed to laboratory contamination.

MH
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology Corporation
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Ms. Barbara Fontes

ANALYSIS NO.: 861010-61
SAMPLING DATE: 10/09/86
DATE SAMPLE REC'D: 10/10/86
INVOICE NO.: 17883

NATURE OF SAMPLE:
Metro Rail Transit - 87-600-0002 - BH-08-60, 530 Ramirez Street - Soil

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg			ug/kg
Chloromethane	<10		1,2-Dichloropropane	< 5
Bromomethane	<10		Trans-1,3-Dichloropropene	< 5
Vinyl Chloride	<10		Trichloroethene	< 5
Chloroethane	<10		Dibromochloromethane	< 5
Methylene Chloride	49	*	1,1,2-Trichloroethane	< 5
Acetone	20	*	Benzene	< 5
Carbon Disulfide	46		cis-1,3-Dichloropropene	< 5
1,1-Dichloroethene	< 5		2-Chloroethylvinylether	<10
1,1-Dichloroethane	< 5		Bromoform	< 5
Trans-1,2-Dichloroethene	< 5		4-Methyl-2-Pentanone	<10
Chloroform	< 5		2-Hexanone	<10
1,2-Dichloroethane	< 5		Tetrachloroethene	< 5
2-Butanone	<10		1,1,2,2-Tetrachloroethane	< 5
1,1,1-Trichloroethane	< 5		Toluene	< 5
Carbon Tetrachloride	< 5		Chlorobenzene	< 5
Vinyl Acetate	<10		Ethylbenzene	< 5
Bromodichloromethane	< 5		Styrene	< 5
			Total Xylenes	< 5

< Denotes compound was not detected above the value indicated.

* Can be attributed to laboratory contamination.

MH
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 10/28/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861121-56
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

Metro Rail Transit 86-600-0002 Field adjacent to center-BH-09-30 (solids)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<1	1,2-Dichloropropane	<0.5
Bromomethane	<1	Trans-1,3-Dichloropropene	<0.5
Vinyl Chloride	<1	Trichloroethene	<0.5
Chloroethane	<1	Dibromochloromethane	<0.5
Methylene Chloride	<0.5	1,1,2-Trichloroethane	<0.5
Acetone	<1	Benzene	1.1
Carbon Disulfide	<0.5	cis-1,3-Dichloropropene	<0.5
1,1-Dichloroethene	<0.5	2-Chloroethylvinyl ether	<1
1,1-Dichloroethane	<0.5	Bromoform	<0.5
Trans-1,2-Dichloroethene	<0.5	4-Methyl-2-Pentanone	<1
Chloroform	<1	2-Hexanone	<1
1,2-Dichloroethane	<0.5	Tetrachloroethene	<0.5
2-Butanone	<1	1,1,2,2-Tetrachloroethane	<0.5
1,1,1-Trichloroethane	<0.5	Toluene	8.8
Carbon Tetrachloride	<0.5	Chlorobenzene	<0.5
Vinyl Acetate	<1	Ethylbenzene	5.6
Bromodichloromethane	<0.5	Styrene	<0.5
		Total Xylenes	0.6

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861121-57
SAMPLING DATE: 11/19/86
DATE SAMPLE REC'D: 11/21/86
INVOICE NO.: 18511

NATURE OF SAMPLE:

Metro Rail Transit 86-600-0002 Field adjacent to center-BH-09-50 (solids)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	ug/kg			ug/kg
Chloromethane	<20		1,2-Dichloropropane	<10
Bromomethane	<20		Trans-1,3-Dichloropropene	<10
Vinyl Chloride	<20		Trichloroethene	<10
Chloroethane	<20		Dibromochloromethane	<10
Methylene Chloride	50	*	1,1,2-Trichloroethane	<10
Acetone	280	*	Benzene	<10
Carbon Disulfide	<10		cis-1,3-Dichloropropene	<10
1,1-Dichloroethene	<10		2-Chloroethylvinyl ether	<20
1,1-Dichloroethane	<10		Bromoform	<10
Trans-1,2-Dichloroethene	<10		4-Methyl-2-Pentanone	<20
Chloroform	<10		2-Hexanone	<20
1,2-Dichloroethane	<10		Tetrachloroethene	<10
2-Butanone	<20		1,1,2,2-Tetrachloroethane	<10
1,1,1-Trichloroethane	<10		Toluene	<10
Carbon Tetrachloride	<10		Chlorobenzene	<10
Vinyl Acetate	<20		Ethylbenzene	<10
Bromodichloromethane	<10		Styrene	<10
			Total Xylenes	<10

* Compound found in laboratory blank

< Denotes compound was not detected above the value indicated.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: The Earth Technology
3777 Long Beach Blvd.
Long Beach, CA 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861125-52
SAMPLING DATE: 11/21/86
DATE SAMPLE REC'D: 11/25/86
INVOICE NO.: 18513

Metro Rail Transit 87-600-0002 - BH-10-35 Ramirez St. (soil)

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<0.5	1,2-Dichloropropane	<0.2
Bromomethane	<0.5	Trans-1,3-Dichloropropene	<0.2
Vinyl Chloride	<0.5	Trichloroethene	<0.2
Chloroethane	<0.5	Dibromochloromethane	<0.2
Methylene Chloride	<0.2	1,1,2-Trichloroethane	<0.2
Acetone	<0.5	Benzene	<0.2
Carbon Disulfide	<0.2	cis-1,3-Dichloropropene	<0.2
1,1-Dichloroethene	<0.2	2-Chloroethylvinyl ether	<0.5
1,1-Dichloroethane	<0.2	Bromoform	<0.2
Trans-1,2-Dichloroethene	<0.2	4-Methyl-2-Pentanone	<0.5
Chloroform	<0.2	2-Hexanone	<0.5
1,2-Dichloroethane	<0.2	Tetrachloroethene	<0.2
2-Butanone	<0.5	1,1,2,2-Tetrachloroethane	<0.2
1,1,1-Trichloroethane	<0.2	Toluene	<0.2
Carbon Tetrachloride	<0.2	Chlorobenzene	<0.2
Vinyl Acetate	<0.5	Ethylbenzene	<0.2
Bromodichloromethane	<0.5	Styrene	<0.2
		Total Xylenes	<0.2

< Denotes compound was not detected above the value indicated.

SP
ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES
DATE 12/17/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

ANALYSIS NO.: 861014-27
SAMPLING DATE: 10/10/86 10:52 AM
DATE SAMPLE REC'D: 10/14/86
INVOICE NO.: 17934

NATURE OF SAMPLE:

Metrorail 87-600-0002 BH-11-25 - 550 Ramirez Street - Soil

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<1.	1,2-Dichloropropane	<0.5
Bromomethane	<1.	Trans-1,3-Dichloropropene	<0.5
Vinyl Chloride	<1.	Trichloroethene	<0.5
Chloroethane	<1.	Dibromochloromethane	<0.5
Methylene Chloride	1.4*	1,1,2-Trichloroethane	<0.5
Acetone	1.8*	Benzene	1.
Carbon Disulfide	<0.5	cis-1,3-Dichloropropene	<0.5
1,1-Dichloroethene	<0.5	2-Chloroethylvinylether	<1.
1,1-Dichloroethane	<0.5	Bromoform	<0.5
Trans-1,2-Dichloroethene	<0.5	4-Methyl-2-Pentanone	<1.
Chloroform	1.4	2-Hexanone	<1.
1,2-Dichloroethane	<0.5	Tetrachloroethene	<0.5
2-Butanone	<1.	1,1,2,2-Tetrachloroethane	<0.5
1,1,1-Trichloroethane	<0.5	Toluene	<0.5
Carbon Tetrachloride	<0.5	Chlorobenzene	<0.5
Vinyl Acetate	<1.	Ethylbenzene	11.7
Bromodichloromethane	<0.5	Styrene	<0.5
		Total Xylenes	2.

* Can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 11/3/86

CHEMICAL RESEARCH LABORATORIES

11631 SEABOARD CIRCLE (213) 598-0458
STANTON, CA 90680 (714) 898-6370

LABORATORY REPORT

FROM: Earth Technology
3777 Long Beach Blvd.
Long Beach, Ca. 90807
ATTN: Barbara Fontes

NATURE OF SAMPLE:

ANALYSIS NO.: 861014-26
SAMPLING DATE: 10/10/86 11:09 AM
DATE SAMPLE REC'D: 10/14/86
INVOICE NO.: 17934

Metrorail 87-600-0002 BH-11-30 - 550 Ramirez Street - Soil

EPA METHODS 624/8240 VOLATILE POLLUTANTS DATA SHEET

	mg/kg		mg/kg
Chloromethane	<0.2	1,2-Dichloropropane	<0.1
Bromomethane	<0.2	Trans-1,3-Dichloropropene	<0.1
Vinyl Chloride	<0.2	Trichloroethene	<0.1
Chloroethane	<0.2	Dibromochloromethane	<0.1
Methylene Chloride	0.4*	1,1,2-Trichloroethane	<0.1
Acetone	0.4*	Benzene	0.8
Carbon Disulfide	<0.1	cis-1,3-Dichloropropene	<0.1
1,1-Dichloroethene	<0.1	2-Chloroethylvinylether	<0.2
1,1-Dichloroethane	<0.1	Bromoform	<0.1
Trans-1,2-Dichloroethene	<0.1	4-Methyl-2-Pentanone	0.7*
Chloroform	0.3*	2-Hexanone	<0.2
1,2-Dichloroethane	<0.1	Tetrachloroethene	<0.1
2-Butanone	<0.2	1,1,2,2-Tetrachloroethane	<0.1
1,1,1-Trichloroethane	<0.1	Toluene	<0.1
Carbon Tetrachloride	<0.1	Chlorobenzene	<0.1
Vinyl Acetate	<0.2	Ethylbenzene	2.
Bromodichloromethane	<0.1	Styrene	<0.1
		Total Xylenes	<0.1

* Can be attributed to laboratory contamination.

< Denotes compound was not detected above the value indicated.

Note: Samples were received in a chilled state, intact and with chain of custody record attached.

ANALYST

REVIEWED & APPROVED
CHEMICAL RESEARCH LABORATORIES

DATE 10/31/86

APPENDIX C
SITE BORING LOGS

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-01 Sheet 1 of 2

Boring Location: BH-01 700 N. Vignes Street		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca, John Hale	Date Started: 10/2/86	Date Finished: 10/2/86
Drilling Equipment: B-53		Completion: Depth (feet) 44 feet	Rock Depth: (feet) 40'
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 8 Dist.:	Undist.: 7 Core:
Borehole Size:		Water Depth (ft): 29.5 First:	Compl.: 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes B.F	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
								Baseline OVA Reading @ 1.6ppm
	Dry, brown, silty fine to medium size grain sand with some small gravel	SP/SM FILL	-					Surface soil may be fill material
5	4'-5.5' Dry, light brown, silty fine - medium size grain sand	SM	1.2	1		3/6/8		
10	9'-10.5' Dry, light brown, silty fine - medium size grain sand with clay lense	SM/SC	2.4	2		3/6/9		Clay is very plastic and the lense is very thin
15	14'-15.5' Dry, light brown, silty fine - medium size grain sand with pea size gravel	SP	1.6	3		19/29/50		
								Cobble gravel at 16 feet
20	19'-20.5' Same as above	SP	1.6	4		20/50		
								Very hard drilling at 21.5 feet
25	24'-25.5' Moist, light brown, fine - medium size grain sand with gravel & occasional cobble	SP/GW	5.8	5		38/50		
	29'-30.5' Wet, gray, fine-medium grain size sand	SP	1.6	6		-		
30								

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-01 Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34'- 35.5' Wet, gray, medium - coarse; to medium-fine grain size sand	SP	3.0	7		-		Quartz sand
40	39'-40.5' No recovery - Cobble gravel	GW						Water sample collected at 40 feet
45	44' Hit boulder							
50								
55								
60								TEMP. = 28.0°C pH = 6.44 σ = 1700 μmho
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-02 Sheet 1 of 2

Boring Location: BH-02 700 North Vignes		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca, John Hale	Date Started: 10/3/86	Date Finished: 10/3/86
Drilling Equipment: B-53		Completion: Depth (feet) 35 feet	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 8 Dist.:	Undist.: 7 Core:
Borehole Size:		Water Depth (ft): 30 First:	Compl.: 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
								Baseline OVA Reading at 2.1ppm
	Dry, brown, silty fine to medium size grain sand with some small gravel	SP(SM) FILL					10:00	Surface soil may be fill material
5	4'-5.5' Dry, light brown, silty fine - medium size grain sand with clay lense	SP(SC)	2.1	1		4/7/7		Clay is very plastic and the lense is very thin
10	9'-10.5' Dry, light brown, silty fine - medium size grain sand	SP	2.1	2		9/11/14		Cobble gravel at 13 feet
15	14'-15.5' Dry, light brown, silty fine - medium size grain sand with pea size gravel		2.1	3		8/12/28		
20	19'-20.5' Dry, light brown, fine - coarse grain size sand with gravel	SP	1.5	4		17/		Hitting occasional cobble
	22'-23.5' Cobble gravel	CW						
25	24'-25.5' Moist, brown, fine, medium, coarse grain size sand with gravel	SP	1.5	5		15/20/35		Quartz sand - quartz is yellow stained
30	29'-30.5' Wet, brown, fine-medium-coarse grain size sand		2.0	6		4/7/19		Sample contained a very thin lense of plastic like clay

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-02 Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34'-035.5' Wet, gray, coarse sand	SP	5.2	7	/		12:30	Quartz sand with Felspar
40								Monitoring well installed
45								
50								
55								
60								
65								TEMP. = 24.7°C pH = 6.35 σ = 1650 μmho
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-002 Field Log of Boring Number: BH-04 Sheet 1 of 2

Boring Location: BH-04 Traffic Island - Santa Ana off-ramp		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca, John Hale	Date Started: 10/2/86	Date Finished: 10/2/86
Drilling Equipment: B-53		Completion: Depth (feet) 57 feet	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 8 / Dist.:	Undist.: 7 / Core:
Borehole Size:		Water Depth (ft): 28. / First:	Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
								Baseline OVA Reading @ 2.0ppm
	0-0.5' Black asphalt	AS						
	0.5' Dry, brown silty fine-medium grain size sand	SP FILL						
5	4'-5.5' Dry, dark brown, to light brown silty fine - medium grain size sand	SP	2.0	1		6/7/9	2:41	
10	9'-10.5' Dry, light brown, silty fine - medium grain size sand with some gravel	SP	2.0	2		4/3/4	2:46	
15	14'-15.5' No recovery		2.0	*3		13/19/24	3:00	Large size gravel was stuck in the sampler shoe. Unidentified odor coming from the borehole
	Cobble gravel	GW						
20	19'-20.5' No recovery		2.0	*4				* OVA readings were obtained from cuttings advancing up the augers
25	24'-25.5' Moist, light brown, fine - medium grain size sand	SP	2.0	5		-	3:18	Not enough recovery for a laboratory sample
	29'-30.5' Wet, gray, fine - coarse sand	SP	2.5	6		15/29/48	3:25	
30								

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-04 Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34'-35.5' Same as above	SP	2.0	7		43/40/50	3:37	
	36.0' Cobble	GW						
40	39'-40.5' No recovery					4/4/11	3:48	Thunder, lightning & rain Received 1.4 inches in approx. 2 hours. Did not attempt to obtain any more soil samples. Assuming surface runoff in the borehole from the rain.
45								
50								
55								
60								Did not obtain below data equipment down due to the rain
65								TEMP. = X pH = X σ = X
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-05 Sheet 1 of 1

Boring Location: BH-05 Denny's parking lot adjacent to Fwy off-ramp		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca, John Hale	Date Started: 9/26/86	Date Finished: Could not penetrate
Drilling Equipment: B-53		Completion: Depth (feet)	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 1 / Dist.:	Undist.: 1 / Core:
Borehole Size:		Water Depth (ft): / First:	Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By:	Checked by:
Type of Seal: 5% bentonite cement grout		Barbara Fontes BF	Allison Urbon

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	0-0.5' Black asphalt	AS						Rebar at 3 feet, moved hole apx. 6' east. Brick was also encountered at 3 feet.
	0.5' Ory, brown medium - coarse grain size sand with pea size gravel, and a thin lense of plastic like clay	SP FILL						
5	4'-5.5' Ory, brown, fine - medium size sand	SP	-	1	/	9/11/12		H_2S in hole (18") = 1ppm
								Concrete at 10 feet
10	Borehole incompleted after two attempts							
15								
20								
25								
30								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 83-600-0002 Field Log or Boring Number: BH-05 (E) Sheet 1 of 2

Boring Location: West side of Denny's driveway		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: G. Deluca, J. Hale	Data Started: 11/24/86	Data Finished: 11/24/86
Drilling Equipment: B-53		Completion: Depth (feet) 45	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia.. 6"		Number of Samples: 8 / Dist.:	Undist.: 7 / Core:
Borehole Size:		Water Depth (ft): 25 / First:	Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	0-0.5' Black asphalt	AS						Encountered brick fragments while drilling at apx. 4'
		FILL						
5	4.0-5.5' Dry, brown, clayey, silty sand	SP		1		24/39/28	11:21	
10	9.0-10.5' Dry, brown, fine-medium grain size sand, well sorted	SP		2		20/10/8	10:30	
15	14.0-15.5' Dry, brown, fine-medium grain size sand, well sorted. Gravel @ 15'	SP		3		39/50	11:36	
20	19.0-20.5' Moist, medium grain size sand, well sorted - to wet sand @ 20'	SP		4		16/40/50	11:40	
25	24.0-25.5' Wet, gray, fine-medium grain sand, well sorted, w/black oily substance w/sheen	SP		5		34/50	12:01	
30								No 30' sample was taken

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-05 (E) Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34.0-35.5' Wet, brown, fine-medium grain sand, well sorted, w/black oily substance w/sheen	SP		6		28/50	12:24	
40								No 40' sample was taken
45	44.0-45.5' Same as above	SP		7		50/50	12:30	
50								
55								
60								Temp. = 26.5 °C pH = 6.8 σ = 1500 μmhos
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-06 Sheet 1 of 2

Boring Location: BH-06 Denny's parking lot - rear		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca / John Hale	Date Started: 9/25/86	Date Finished: 9/25/86
Drilling Equipment: B-53		Completion: Depth (feet) 55 feet	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 9 Dist.:	Undist.: 8 Core:
Borehole Size:		Water Depth (ft): 29 First:	Compl.: 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By:	Checked by:
Type of Seal: 5% bentonite cement grout		Barbara Fontes BF	Allison Urbon

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
		AS					10:20	Baseline OVA reading @ 2.0ppm
	0-0.5' Black asphalt 0.5' Dry, brown medium-coarse grain size sand with pea size gravel.	SP FILL						
5	4'-5.5' Dry, brown, silty fine - medium grain size sand with a thin lense of plastic like clay	SP/SC	4	1	/	4/5/6		
10	9'-10.5' Dry, light brown, coarse sand with small size gravel	SP	4	2	/	20/40/43		
15	14'-15.5 Change in color to dark brown. Material same as above and is moist		4	3	/	17/40/50		
20	19-20.5 Dry, red-brown, coarse sand with small size gravel.	SP	3	4	/	30/38/40		
25	24'-25.5' Very moist, gray, coarse sand with small size gravel		7	5	/	20/40/43		
30	29'-30.5' Wet, dark gray, fine - medium grain size sand, w/very thin clay lense	SP/SC	32-18	6	/	7/20/50		Sample is coated with oily like film

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-06 Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34'-35.5' Wet, light gray, fine - medium grain size sand	SP	9	7		23/50		
		GW						
40	39'-40.5' Same as above			-		7/15/38		
	41'-42' Cobble							
45	44'-45.5 Wet, light gray, fine - medium grain size sand. At 45.5 feet the sand is very fine	SP	8	8		13/27/50		Sand contains abundant mica at 45.5 feet and the sand becomes very fine. OVA reading in the hole. is 4ppm
50	49'-50.5' No recovery							
55								
60								
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-06A Sheet 1 of 2

Boring Location: BH-06A rear parking lot at Denny's		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg DeLuca / John Hale	Date Started: 9/26/86	Date Finished: 9/26/86
Drilling Equipment: B-53		Completion: Depth (feet) 35.5	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 8 / Dist.:	Undist.: 7 / Core:
Borehole Size:		Water Depth (ft): 27.5 / First:	Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
								Baseline OVA reading at 2ppm
0	0-0.5' Black asphalt.	AS					11:00	
	0.5' Dry, brown, medium course grain size sand	SP / FILL						
5	4'-5.5' Dry, brown, medium - coarse grain size sand to fine sand	SP	2	1		5/7/19	11:22	
10	9'-10.5' Dry, light brown, medium - coarse grain size sand		3	2		9/16/24		Last 6" of sample is dark brown, silty coarse sand
	13' Hit large cobble							
15	14'-15.5' Dry, light brown to gray sand w/ cobble	GW	3	3		50 for 4"		
20	19 ' - 20.5' Dry, brown, medium - coarse grain size sand with pea size gravel	SP	3	4		20/50		
	23' Cobble gravel							
25	24'-25.5' Moist, light brown, medium - course grain size sand		2	5		24/50		
30	29'-30.5' Wet, gray, medium - coarse grain size sand to fine grain size sand		16	6		26/24/50		Quartz sand "salt & pepper"

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-06A Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34'-35.5' Wet, gray, medium grain size sand	SP	12	7	/	17/26/32		Sand is well sorted
40								
45								
50								
55								
60								
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-07 (H) Sheet 1 of 2

Boring Location: Adjacent to Denny's & Howard Street		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca, John Hale	Data Started: 11/20/86	Data Finished: 11/20/86
Drilling Equipment: B-53		Completion: Depth (feet) 45	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 8 / Dist.:	Undist.: 7 / Core:
Borehole Size:		Water Depth (ft): 29.5 / First:	Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	Dry, brown, fine-medium grain size silty sand w/grass and roots	SP FILL					9:00	OVA set at 2ppm BG OVA @ 5ppm near rig
5	4.0-5.5' Dry, brown, fine-medium grain size silty sand w/brick fragments and grass	SP	BG	1		7/13/13	9:25	Encountered brick fragments in cuttings
10	9.0-10.5' Same as above for top 9", then dry light brown, fine-course grain size sand, poorly sorted	SW	BG	2		6/5/8	9:28	
15	14.0-15.5' Same as above, w/pea size gravel	SW	BG	3		15/30/49	9:31	OVA - BG in hole
20	19.0-20.5' Same as above	SW	BG	4		20/50	9:48	
25	24.0-25.5' Dry, gray, fine-coarse grain size sand w/pea gravel	SW	BG	5		14/50	9:53	OVA = BG in hole 28' hit clear oily substance sample
30	29.0-30.5' Wet, gray, medium-coarse grain size quartz sand, well sorted (uniformly graded)	SP	4	6		22/50	10:01	

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-07 (H) Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34.0-35.5' No recovery			7		50	10:10	
	Cobble gravel							
40	39/0-40.5' Wet, gray, coarse grain size quartz sand	SP	3	8		50	10:48	
45	44.0-45.5' No recovery							Water sample at 11:44
50	Note: Encountered during previous attempts at less than 5 feet below the surface: Rebar Concrete Pipes							
55								
60								
65								Temp. = 26.0 °C pH = 6.5 σ = 1820 μmhos
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-08 A Sheet 1 of 1

Boring Location: BH-08 Corner lot - Ramirez & Howard St.		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: Greg Deluca, John Hale	Date Started: 9/29/86	Date Finished: not complete
Drilling Equipment: B-53		Completion: Depth (feet) 15	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 2 / Dist.:	Undist.: 1 / Core:
Borehole Size:		Water Depth (ft):	First: / Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
0	Grass, glass, roots, dry, brown silty sand with some small gravel, pieces of brick	SP FILL	-				10:30	Note: 1. went 0 - ≃10' when monitoring equipment failed.
5	4'-5.5' Ory, dark brown to brown silty medium-coarse grain size sand w/ gravel	SP		1		13/9/9		2. 10/1 moved hole and hit rebar at 3' Borehole B 3. 10/1 moved hole and hit rebar at apx 3' Borehole C
10	9'-10.5' Same as above - no recovery			-				4. 10/1 redrilled in old (hole which was not sealed Borehole A
	12'-15' Black, oily, viscous substance	?					11:15	5. Oid not collect a soil sample at 10' because of cross contamination potential
15								6. At 15' - OVA ≃ 2-ppm & fluctuating (btm. is +23 ppm) reading in the borehole
20								7. May have hit underground tank or a storage sump. Did not want to go through a tank bottom & contaminate clean sub-surface soil. Terminated the boring at 15 feet
25								8. After pulling augers, OVA readings (in the borehole) fluctuated greatly up to 380ppm
30								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-08 D Sheet 1 of 2

Boring Location: BH-08D ~ 10 feet northwest of BH-08A		Elevation and Datum:	
Drilling Agency: Orill Line	Driller: Greg Deluca, John Hale	Date Started: 10/8/86	Date Finished: 10/9/86
Drilling Equipment: B-53		Completion: Depth (feet) 60	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 10 Dist.:	Undist.: 9 Core:
Borehole Size:		Water Depth (ft): 29 First:	Compl.: 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By:	Checked by:
Type of Seal: 5% bentonite cement grout		Barbara Fontes BF	Allison Urbon

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	Ory, brown, silty fine-medium grain size sand w/small gravel grass and roots, pieces of brick	SP					10:10	Baseline OVA Reading at 2ppm
	4' - 5.5' Same as above	FILL						
5			3	1		4/11/14	10:18	OVA reading 4 ppm in borehole
		SP						
10	9'-10.5' Ory, brown, silty fine-medium grain size sand with gravel to coarse yellow brown sand with small size gravel		4	2		9/11/13		
15	14'-15.5' Dry, brown, silty fine-medium grain size sand with small gravel & occasional cobble		5	3		45/30/30		
	16.0' Cobble	GW						
20	19'-20.5' Ory, brown, silty fine-medium grain size sand with small gravel		5.4	4		36/50	10:41	OVA reading 6ppm in borehole
		SP						
25	24'-25.5' Same as above		7	5		35/50	10:50	OVA is drifting
	29'-30.5' Black tar-like viscous substance	??		6		50/50	11:09	
30								

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-08 D Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34'-35.5' Wet, gray, medium-coarse grain size sand	SP	7.4.	7		50 for 6"	11:20	
40	39'-40.5' Same as above			8		-	12:07	Quartz sand
45	44'-45.5' Same as above	SP		9		10/19/50	2:28	
50	49'-50.5' Wet, coarse grain size black & white sand					-	-	10/9/86
							9:45	No recovery
55	54'-55.5' Same as above					-	9:50	No recovery
60	59'-60.5' Same as above	SP				-	10:30	No recovery
	Note: Encountered in previous attemps less than 5 feet below the surface: Concrete and rebar							Temp. = 27.1° pH = 7.10 σ = 2200 μmho
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-09 (A) Sheet 1 of 2

Boring Location: Between Center & Howard in field			Elevation and Datum:		
Drilling Agency: Orill Line	Driller: G. Deluca J. Hale		Data Started: 11/19/86	Data Finished: 11/19/86	
Drilling Equipment: B-53			Completion: Depth (feet) 50'	Rock Depth: (feet)	
Method of Drilling: Hollow Stem Auger Dia. 6"			Number of Samples: 8 Dist.:	Undist.: 7	Core:
Borehole Size:			Water Depth (ft): -30' First:	Compl.:	24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack			Logged By:	Checked by:	
Type of Seal: 5% bentonite cement grout			Barbara Fontes BF	Allison Urbon	

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	Dry, brown, silty sand with small gravel, roots	SP FILL						8:00-10:14 stand by Hit large cobble at 2.5 to 4 feet
	4.0-5.5' No recovery, cobble							
5								Evidence of brick road at apx. 4 - 5 feet.
10	9.0-10.5' Dry, dark borwn, fine-medium grain size silty sand	SP	2	1		3/6/7	10:38	
15	14.0-15.5' Dry, dark brown, fine-medium grain size silty sand with ground brick	SP	1.6	2		10/13/8	10:50	BG OVA set at 20ppm OVA reading at rig = 30ppm
20	19.0-20.5' No recovery - hit rock	GP ?					10:59	No OVA recovery
25	24.0-25.5' Dry, dark brown, fine-medium grain size silty sand with blackish substance	SM	1	4		33/50	11:14	OVA @ 4ppm BG OVA is drifting
30	29.0-30.5' Same as above	SM	5	5		50	11:23	Oil sheel on H_2O & sampler (ctd.)

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-09 (A) Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
								Upper surface of H_2O black in color with rainbow sheen. Blackish substance stained gloves permanently.
35	34.0-35.5' Same as above	SM		7		32/50	11:50	Viscous black sheen, no OVA sample
								11:56 OVA BG 20ppm around rig
40	39.0-40.5' Wet, gray, medium grain size sand, well sorted, with sheen	SP		8		8/30/50	11:59	Sand is the same type found in other holes (on this project) below 40' depth OVA drifting in BG
45	44.0-45.5' Same as above	SP	3	9			12:17	
50	49.0-50.5' Wet, gray, medium-course grain size sand	SP	12	10			12:40	OVA off-scale @ x10 scale (>100ppm)
								Quartz sand - salt & pepper
55	Note: Encountered during previous attempts at 4 feet below the surface: Concrete; Rebar; Pipes						1:20	Completion
60	Excavated area near the borehole contains concrete reinforced with railroad ties, brick foundations, and pipes.							Temp. = 25.2 °C; ph = 6.8; σ = 2000 μmhos
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-10 Sheet 1 of 2

Boring Location: Across from Piper - Ramirez St.		Elevation and Datum:	
Drilling Agency: Drill Line	Driller: G. Deluca, J. Hale	Data Started: 11/21/86	Data Finished: 11/21/86
Drilling Equipment: B-53		Completion: Depth (feet) 55	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 9 Dist.:	Undist.: 8 Core:
Borehole Size:		Water Depth (ft): 34 First:	Compl.: 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	Dry, dark brown to black silty medium grain size sand, well sorted	SP						OVA set @ 2ppm BG reading (air) of 4ppm
		FILL						
5	4.0-5.5' Same as above	SP	BG	1		9/6/8	9:10	Evidence of old building foundation and side walk at 2 and 5 feet in the vicinity of the borehole.
10	9.0-10.5' Dry, brown, silty fine -medium grain size sand, well sorted	SP	BG	2		9/9/4	9:21	Pipes, concrete foundation, old brick road, and wood beams are exposed in the excavated area adjacent to the borehole.
15	14.0=15.5' Dry, gray, silty fine-medium grain size sand	SP	.2	3		14/19/30	9:27	OVA 3ppm @ hole
20	19.0-20.5' Same as above	SP	.6	4		29/50	9:34	OVA 4.5ppm @ hole drifing 1 brass recovery
	23.0' Gravel							
25	24.0-25.5' Same as at 14 ft. w/some pebble or pea sized gravel	SP	.4	5		18/38/50	9:40	
	29.0-30.5' Gray-black fine-medium grain size sand w/tar-like substance	SP	.4	6		13/42/50	9:45	
30								

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-10 Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
35	34.0-35.5' Same as above, wet. Water and soil have rainbow sheen and black tar-like substance	SP	800	7		29/50	10:00	OVA BG - drifing to 7ppm methane calibration check is ok - samples covered w/sheen
40	39.0-40.5' Same as above, same sheen	SP		8		27/50	10:10	600ppm downhole samples covered w/sheen
45	44.0-45.5' No recovery (OVA only)		10.5				10:18	350ppm downhole @ 44.5'
	Gravel cobble	GW						Problems with heaving - going 10ft. for water sample
50								
55	54.0-55.5' Wet, gray-black fine-medium grain size sand	SP	15				10:35	No recovery for lab OVA only
60	Note: It is possible that fill material may exist below a 5 foot depth. The excavated area adjacent to the borehole contains: 1. Old brick road 2. Concrete foundation 3. Metal pipes 4. Rebar 5. Wood beams							Temp. = 25.2 °C pH = 6.82 σ = 1450 μmhos oil sheen
65								
70								

The Earth Technology Corporation

BORING LOG

Project Name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-11 Sheet 1 of 2

Boring Location: BH-11 - Corner of Ramirez & Center Streets		Elevation and Datum:	
Drilling Agency: Orill Line	Driller: Greg Deluca, John Hale	Date Started: 10/10/86	Date Finished: 10/15/86
Drilling Equipment: B-53		Completion: Depth (feet) 60	Rock Depth: (feet)
Method of Drilling: Hollow Stem Auger Dia. 6"		Number of Samples: 5 / Dist.:	Undist.: X / Core:
Borehole Size: 6"		Water Depth (ft): 29 / First:	Compl.: / 24 hrs.
Type of Perforation Backfill: #3 Monterey Sand Pack		Logged By: Barbara Fontes BF	Checked by: Allison Urbon
Type of Seal: 5% bentonite cement grout			

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
	Dry, brown, silty fine-medium grain size sand with grass and roots.	SP FILL					10:00	
	3'- Concrete							
5	4'- 5.5' Dry, brown, silty fine-medium grain size sand with small gravel		–	1		4/15/15	10:13	At apx. 3 feet concrete or the old brick road was encountered.
10	9' -10.5' Same as above	SP	–	2		10/17/20	10:20	
	13' Gravel							
15	14'-15.5' Dry, brown, silty fine-medium grain sand with gravel	SP/GW	13	3		20/50	10:27	
20	19'-20.5' Dry, brown, fine-medium grain size sand with gravel	SP	3	4		34/48/32	10:30	Hydrocarbon odor very strong. OVA reading in the borehole at 150ppm EXP. = 2%
25	24'-25.5' Black viscous substance	??	675	5		32/50	10:52	Downhole: OVA reading off scales 1x, 10x, 100x
30	29'-30.5' Wet, gray, coarse sand	SP	8					Cable unwound off rig no recovery

The Earth Technology Corporation

BORING LOG

Project name: Metro Rail Transit

Project Number: 87-600-0002 Field Log of Boring Number: BH-11 Sheet 2 of 2

Depth (feet)	Description	Graphic Log: Lithology	Graphic Log: OVA (ppm)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Drilling Rate/Time	Remarks
		SP						
	32.5' Grades to cobble gravel							
35		GC						Having problems with drilling hoist line
40								Air space OVA reading is 10ppm
45								Note: Borehole redrilled 2 times
	45' Wet, gray, coarse sand to fine-medium grain size sand							Abandoned hole due to: . equipment breakage . drop hammer wedge in lower augers . drop hammer broke and 1/2 fell to lower augers
50								
55								
60								
65								
70								

APPENDIX D

GROUNDWATER SAMPLING RECORDS

The Earth Technology Corporation

WATER QUALITY SAMPLING - Newly Installed Monitoring Well

PROJECT NAME MRTC WELL NO. BH-11 GROUND SURFACE ELEVATION Information Not Available

PROJECT NO. 87-600-02 INSTRUMENT TYPE Bailer TOP CASING ELEVATION flushed Christie box

ORDER OF SAMPLING RECORDED BY R. Thomasser R. Thomasser

DATE	TIME	TAPE READING AT MEASURING POINT	TAPE READING AT WATER MARK	DEPTH TO WATER	DEPTH TO BOTTOM	Gallons Bailed	SPECIFIC CONDUCTIVITY (MHOS)	TEMPER-ATURE	PH	OVA	REMARKS
11/14/86	10:30	25.0' -	1.41" =	23.59		4	1400	40	5.9	-	Orange/cloudy
"						8	1390	40.5	5.8	-	Orange/cloudy
"						12	1390	40	5.9	-	Orange/cloudy
"						16	1400	40	5.9	-	Orange/clear
"						20	1400	40	5.8	-	Clearer
"						25	1400	40	5.9	-	clear
"						30	1400	40	5.9	-	clear
	11:40								Sample		

H-05 1-80

The Earth Technology Corporation

WATER QUALITY SAMPLING - Newly-Installed Monitoring Well

PROJECT NAME MRTC WELL NO. BH-02 GROUND SURFACE ELEVATION Information not available

PROJECT NO. 87-600-02 INSTRUMENT TYPE Bailer TOP CASING ELEVATION flushed Christie box

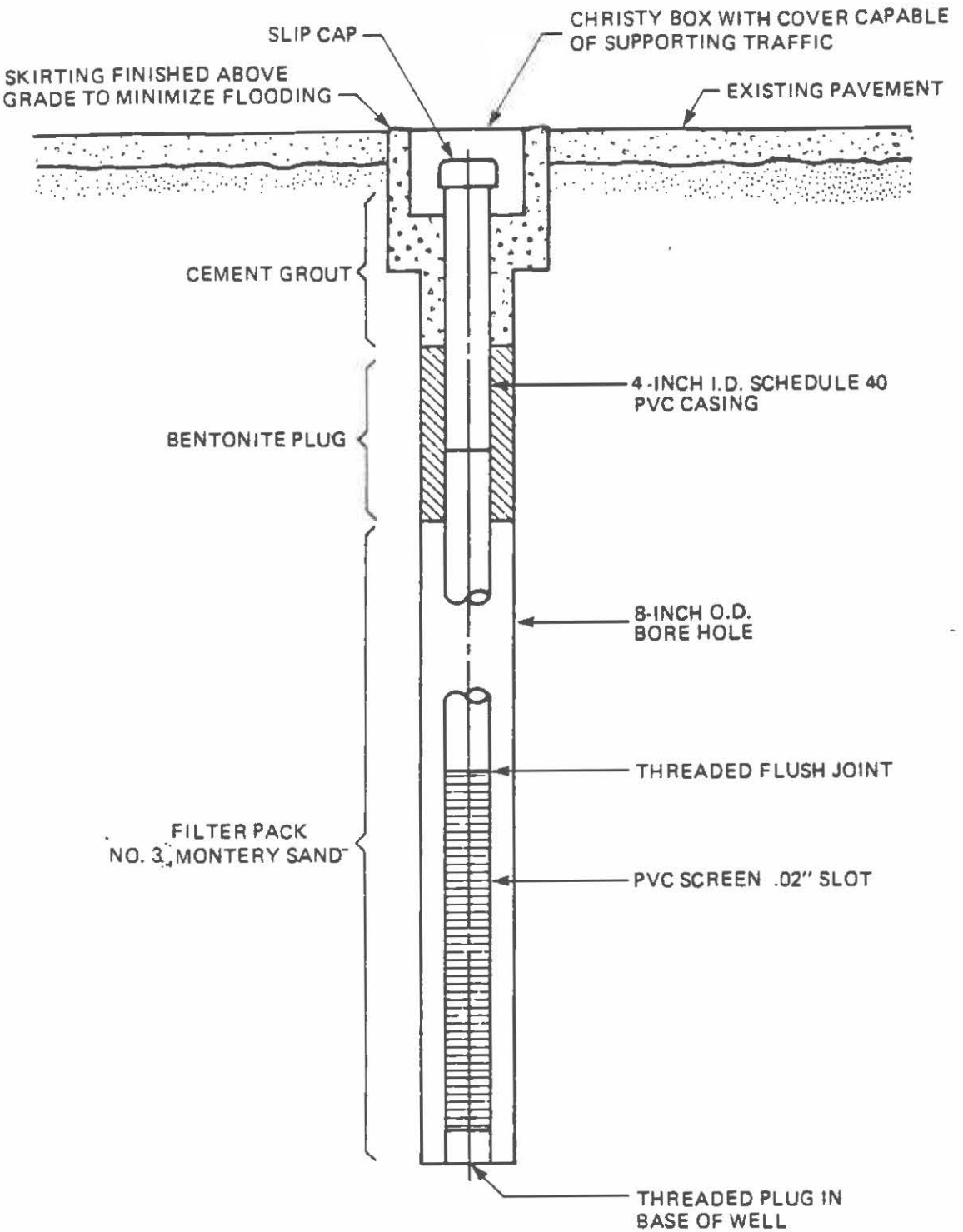
ORDER OF SAMPLING _____ RECORDED BY R. Thomasser R Thomasser

DATE	TIME	TAPE READING AT MEASURING POINT	TAPE READING AT WATER MARK	DEPTH TO WATER	DEPTH TO BOTTOM	Gallons Bailed	SPECIFIC CONDUCTIVITY (MHOS)	TEMPER-ATURE °C	PH	OVA	REMARKS
11/14/86	9:20	27.0' -	1.27' =	25.73'							
"						2	1100	35	5.3	-	Brown/silty
"						4	1100	38	5.5	-	Brown/silty
"						8	1020	38	5.6	-	Brown/silty
"						12	1030	38	5.8	-	Brown/silty
"						14	1030	38	5.9	-	Brown/silty
"						21	1025.	38	5.8	-	Brown/silty
"						25	1025	38	5.8	-	Brown/silty
"	10:15									Sample	

H-05 1-80

APPENDIX E

MONITORING WELL INSTALLATION RECORD



NOT TO SCALE

The Earth Technology Corporation	PROJECT NO.: METRO RAIL TRANSIT
TYPICAL MONITORING WELL	

The Earth Technology Corporation

WELL CONSTRUCTION LOG

PROJECT NAME: Metro Rail Transit

PROJECT NUMBER: 87-600-0002

WELL LOCATION: 700 North Vignes

LOGGED BY: Barbara Fontes

DEPTH TO WATER (FEET FTOC): 30

DRILLING CO.: Drill Line

DRILLER: Greg DeLuca

RIG TYPE: B-53

DRILLING METHOD: Hollow Stem Auger

BOREHOLE DIAMETER (INCHES):

SAMPLING METHOD: Split Spoon

SAMPLING INTERVAL (FEET): 5 feet

TOTAL DEPTH DRILLED (FEET): 35

CASING TYPE: Schedule 40, PVC

CASING DIAMETER (INCHES O.D.): 4"

SCREEN TYPE: PVC

SLOT SIZE (INCHES): .02

SCREENED INTERVAL (FEET): 25 TO 35

CASING INTERVAL (FEET): 25 TO 0

FILTER PACK: Monterey #3 Sand

FILTER INTERVAL (FEET): 35 TO 22

BENTONITE SEAL (FORM): Pellets (3')

BENTONITE INTERVAL (FEET): 19 TO 22

GROUT TYPE: Bentonite/Cement

PERCENT BENTONITE IN GROUT: 5%

GROUT INTERVAL (FEET): 19 TO 0

WELLHEAD: flushed Christie box

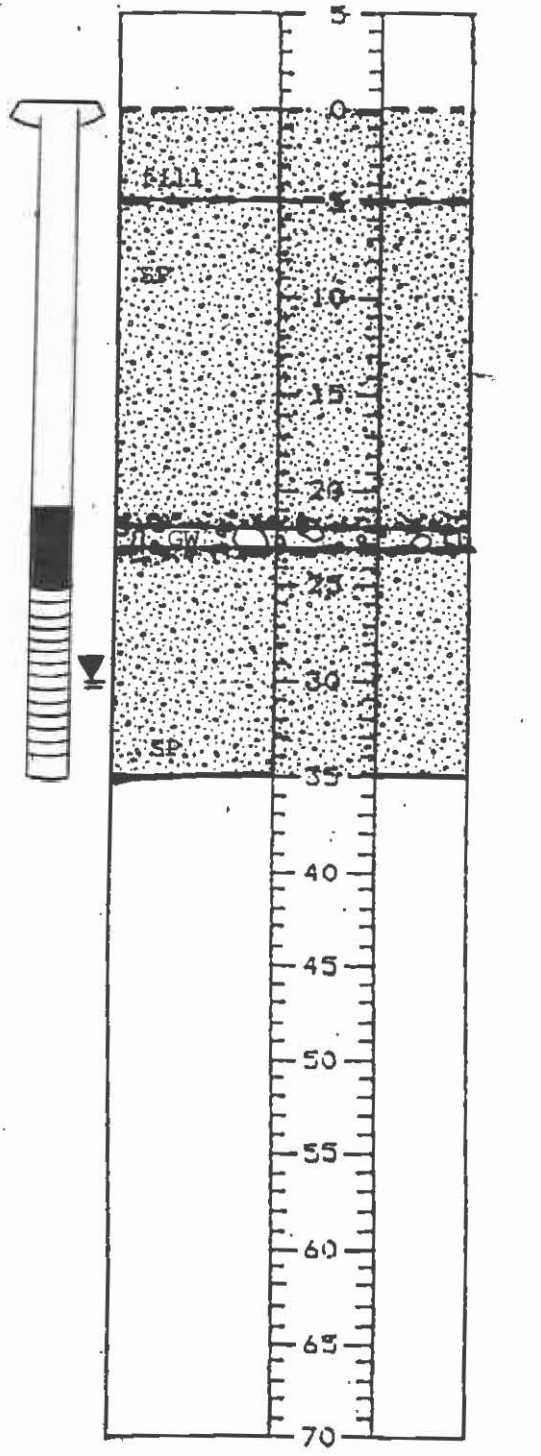
COMMENTS:

WELL NUMBER: 02

DRILLING PROGRESS

DATE	START	FINISH
10/3/86	10/3/86	10/3/86

WELL SKETCH
(DEPTH IN FEET)



The Earth Technology Corporation

WELL CONSTRUCTION LOG

PROJECT NAME: Metro Rail Transit

PROJECT NUMBER: 87-600-0002

WELL LOCATION: corner of Ramirez and Center Street

LOGGED BY: Barbara Fontes

DEPTH TO WATER (FEET FTOC): 29

DRILLING CO.: Drill Line

DRILLER: Jeff DeLuca

RIG TYPE: B53

DRILLING METHOD: Hollow-steam auger

BOREHOLE DIAMETER (INCHES):

SAMPLING METHOD: split spoon

SAMPLING INTERVAL (FEET): every 5 feet

TOTAL DEPTH DRILLED (FEET): 57'

CASING TYPE: Schedule 40 PVC

CASING DIAMETER (INCHES O.D.) 4 inch

SCREEN TYPE: slotted PVC

SLOT SIZE (INCHES): .02

SCREENED INTERVAL (FEET): 57 TO 52

CASING INTERVAL (FEET): 52 TO 0

FILTER PACK: Monterey #3 Sand

FILTER INTERVAL (FEET): 57 TO 48'

BENTONITE SEAL (FORM): pellets

BENTONITE INTERVAL (FEET): 48 TO 45

GROUT TYPE: Bentonite/cement

PERCENT BENTONITE IN GROUT: 5%

GROUT INTERVAL (FEET): 45 TO 0

WELLHEAD: flushed Christie box

COMMENTS:

WELL NUMBER: 11

DRILLING PROGRESS

DATE	START	FINISH
10/10/86	10/10/86	10/15/86

WELL SKETCH
(DEPTH IN FEET)