Treadwell&Rollo

Rcvd 6/11/02

RO 378

10 June 2002
Project 2543.02

Mr. Barney Chan
Alameda County Health Care Services
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Subject: Addendum to the 1999 Remedial Investigation Report
2855 Mandela Parkway
Oakland, California

Dear Mr. Chan:

Treadwell & Rollo, Inc. has prepared this *Addendum* to the *1999 Remedial Investigation Report* for the property at 2855 Mandela Parkway in Oakland, California. As we discussed during our September 6, 2001, meeting with you, Treadwell & Rollo, Inc. prepared this addendum which includes recent investigation data (2001), presentation and evaluation of geologic cross-sections, and an estimation of the free-phase product volume. This addendum also presents our recommendations for an Interim Corrective Action Plan (CAP).

Background

The existing building on the property is a 143,000 square foot, single-story industrial structure. The building is currently occupied by a number of commercial tenants, mainly for warehousing and storage. The building was originally constructed in 1941 and operated until approximately 1983 by International Harvester as a truck service and sales facility. An underground gasoline storage tank was removed from property in 1991 by a previous owner, Cypress Property.

Geologic conditions at the site consist of approximately two to eight feet of relatively sandy fill material underlain by Bay Mud to a depth of at least 24 feet below grade. The clayey Bay Mud appears to include heterogeneous zones of sandier soil and organic matter. The stabilized groundwater depth is approximately eight to ten feet and there are indications of a localized (i.e., discontinuous) perched water zone at the interface between the fill and the Bay Mud.

Environmental investigations have confirmed the presence of gasoline free-phase product within the Bay Mud and potentially significant concentrations of the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) in groundwater beneath a portion of the property, including under the existing building. However, a soil vapor survey in 1998 suggested only relatively low benzene concentrations in the shallow soil beneath the building. A sample of

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perched water was collected in 1999 above an area of groundwater known to contain detectable BTEX concentrations; the perched water samples did not contain detectable BTEX concentrations.

These previous investigation results suggest that gasoline vapors from the free-phase product and those dissolved in the groundwater are inhibited from upward migration into the fill zone beneath the building because of geologic conditions. These conditions include the low-permeability clayey Bay Mud matrix and the presence of a perched water zone, as well as other factors. A study of the indoor ambient air quality completed in March 2001, concluded that gasoline vapors, specifically BTEX, are not migrating in significant concentrations from the subsurface into the building.

Evaluating the distribution of petroleum hydrocarbons, including those in the soil vapors, required collecting additional field data along multiple lines of evidence:

- Concentrations present in soil gas immediately beneath the existing concrete floor slab
- The presence and chemical quality of a perched water layer at the fill/Bay Mud interface
- The vertical distribution of gasoline free product in the Bay Mud soil column.

The work scope to gather these data was divided into the following tasks.

Task 1. Soil Vapor Sampling and Analysis

Ten soil vapor sampling locations are shown on the attached map. The locations were chosen to provide data to evaluate the potential for vapor migration into the occupied building space. Locations A, B, and D were chosen because they are located immediately above the free product pool. Sampling locations C, E, F, G, and H were chosen because they are adjacent (laterally) to the free product plume or dissolved phase plume beneath occupied portions of the building. Sampling locations I and J were chosen to provide additional lateral definition of the soil vapor plume, if present.

Sampling and Analysis Procedures:

- To provide access for soil-vapor sampling, the concrete floor slab was cored using a 4-inch diameter core. The base rock immediately below the core locations was removed, as appropriate, to facilitate installing the soil vapor sampling probes.
- Dedicated vapor-sampling probes were installed using a direct push technique. The dedicated soil vapor probe points (stainless steel) and Teflon sampling tubes will remain in place for subsequent and repeat sampling/monitoring as appropriate. The sampling

tubes were grouted in place to provide a vapor seal between the slab and the underlying sand/fill.

- The shallow soil vapor probes were set at approximately 2 to 3 feet below top of slab to correspond with the middle of the sandy fill interval.

- Soil-vapor samples collected from each sampling location were analyzed for BTEX by a California State-certified laboratory (SunStar Laboratories, Inc. of Tustin, California).

Task 2. Stratigraphic Soil Borings and Perched Water Monitoring Well

Two soil borings (2-inch diameter, direct-push probes with continuous soil collection) were advanced to provide additional stratigraphic data (see attached map for locations).

Soil Boring SB-35 is located between existing wells TR-4 and TR-6, both of which have contained free-phase product. The purpose of this boring was: 1) to provide additional stratigraphic information regarding vertical distribution of free product within the Bay Mud; and 2) enable monitoring for the presence and chemical quality of the perched water zone, if present. A continuous core sample was collected from this location. Soil boring SB-36 was advanced to a total depth of approximately 20 feet below ground surface. The continuous core was evaluated in the field for detailed stratigraphic characteristics and was screened in the field for the potential presence of gasoline free product using a Photo-Ionization Detector (PID)-type organic vapor meter. The boring was backfilled with cement grout.

The proposed scope of work stated that a shallow groundwater well would be installed if clear evidence of a perched water zone was observed at Soil Boring SB-35. The shallow sandy unit appeared wet, but it was inconclusive whether a perched water zone is present. Therefore, a shallow well was not installed.

Soil Boring SB-36 was located within the boundary of the former UST excavation. The purpose of this boring was to: 1) evaluate whether free-phase product has been collecting within the former tank excavation; and 2), similar to SB-35, to evaluate the stratigraphy of the Bay Mud and vertical distribution of free product within the soil column. While advancing this boring, concrete debris assumed to be the former surface cap was encountered at a depth of approximately 6 feet below the current ground surface. The Geoprobe™ could not be advanced through the concrete debris, and the boring was stopped at that depth.

Five (5) geologic cross-sections were prepared using soil boring information from each of the relevant previous investigations conducted since 1991. The purpose of this evaluation was to verify whether an organic-rich zone (i.e., "peaty" zone comprised of fibrous organic detritus) identified during our most recent field investigation is present throughout the subsurface at the site.

Task 3. Install Free-Phase Product Monitoring Wells

Based on discussions with the Alameda County Health Care Services (ACHCS), three additional monitoring wells were installed. These wells are designated as TR-7, TR-8, TR-9 on the attached site map. The purpose of these wells is to monitor the stability (i.e., lateral extent) of the free-phase product plume. The locations for these free-phase product plume monitoring wells were chosen based on the assumed extent of that plume. The intent was to place the wells slightly beyond the lateral extent of the free product plume.

The free-phase product monitoring wells were constructed of 1-inch diameter polyvinyl chloride (PVC) well casing (inside diameter of 0.75 inches). The screened intervals are positioned to permit free phase gasoline, if present, to enter and accumulate in the well casing.

Additionally, because the purpose for these wells is to monitor whether the extent of the free-phase product plume is stable, groundwater will not be extracted from these wells. Groundwater removal by purging or other activities could potentially cause localized disturbance and migration of the free product plume. Therefore, free-phase product monitoring will be conducted using an electronic interface probe (IP). Initially, these wells will be monitored quarterly (every three months) for the first year. Subsequent monitoring will be conducted on an annual, or as needed, basis.

Additional Investigation Results

The soil vapor samples collected from the ten probes installed in June 2001 did not contain detectable concentrations of BTEX. These probes are typically located within the shallow soil above areas that are known to have free-phase product or high concentrations of gasoline in the groundwater. These results suggest that gasoline vapors (specifically the BTEX constituents) are not migrating upward towards the building. These data further support the previous (March 2001) indoor air sample results that also indicate that gasoline vapors from the subsurface are not entering the building through the floor slab. The data sheets from the analytical laboratory are attached.

At most soil boring locations, there is a shallow, sandy zone that typically occurs between the ground surface to 5 feet deep. That sandy zone is typically underlain by a clay zone. The base of the shallow sandy zone is sometime very wet to saturated, and may represent a perched water zone at the interface between the sandy and clay zones. This perched water zone appears to be relatively thin, and may not be present beneath the entire site. Soil boring logs and geologic cross-sections are attached.

The free-phase gasoline appears to be present in a relatively thin, laterally discontinuous zone of organic-rich ("peaty") clay that typically occurs between 6 and 9 feet below the ground surface. The peaty zone occurs as a thin (approximately 1-foot thick) horizon of interbedded peat and clay layers. The peaty clay zone appears significantly more permeable than the surrounding clay, thereby allowing accumulation and flow within that unit. The peaty clay zone was not encountered in each soil boring suggesting that the peaty clay zone is discontinuous. As such, the free-phase gasoline plume configuration is also likely discontinuous, occurring in localized areas (i.e., where the peaty zone is present) rather than beneath the entire site.

The result of further evaluation (preparation and interpretation of geologic cross-sections) did not reveal documentation of a well-defined, shallow peaty zone extending continuously beneath the site (see attached geologic cross-sections, Figures 2 through 6). This could be because the previous investigations by others used soil-sampling techniques, such as split-spoon sampling at 5-foot intervals, which missed the thin peaty zone and therefore was not sampled or described in the soil-boring logs. Previous soil descriptions may also not have differentiated the peaty zones from other thin horizons within the predominantly clay-rich subsurface materials.

The absence of description of the peaty zone in earlier boring logs could also indicate that the peaty zone occurs as a discontinuous layer of geologic material. However, with the exception of our most recent soil boring TR-8, Treadwell & Rollo identified the peaty zone in each of the soil borings that used a continuous sampling technique. Therefore, for the purpose of planning future site activities (i.e., monitoring and free-phase product removal), we have assumed that the peaty zone is present beneath most of the site, but may vary in thickness from several inches to approximately 1.5 feet.

The geologic cross-sections prepared for this evaluation also illustrate the relative vertical position of the peaty zone with the former underground storage tanks (USTs). The peaty zone, where identified, is located at approximately the same depth as the bottom of the former tanks. Therefore, free-phase product released from the USTs could have migrated directly into the peaty zone. Because the peaty zones appear to have a higher permeability than the surrounding clay, the free-phase product could be restricted to the peaty zone and therefore preferentially migrate within that zone.

None of the monitoring wells (TR-7, TR-8, and TR-9) installed for this additional investigation contain a measurable thickness or sheen of free-phase gasoline. The peaty clay unit was observed in the borings for Wells TR-7 and TR-8. The wells were constructed such that liquid from that zone will enter the well screen. Because free-phase gasoline was not observed in these wells, this suggests that the lateral extent of free-phase gasoline on the groundwater surface has been defined. Subsequent monitoring of those wells will be used to evaluate whether the free-phase gasoline is migrating.

Free-Phase Product Volume Estimate

Previous free-phase product volume calculations assumed that the free-phase product occurred as a lense-shape (i.e., thick in the center, thin on the edges) pool floating on the shallow groundwater surface. The thickness of this lense-shape pool was estimated based on stabilized free-phase thickness measured in several monitoring wells. The previous volume calculations assumed a range in potential free-phase product thickness (because an actual thickness could not be reliably measured), a porosity of the aquifer material, specific density of gasoline, and a free-phase product lateral extent area ranging from approximately 15,000 to 28,000 square feet. As a result of using these assumptions, the initial calculated free-phase product volumes ranged up to 82,000 gallons. However, the lateral extent area of the free-product plume was further defined with additional wells and soil borings and the area was revised to approximately 15,000 square feet. Using the smaller free-product lateral-extent area and a revised product thickness derived from removal tests, the average free-product volume was estimated at approximately 15,000 gallons. This volume appears high based on an assumed release from the former 350-gallon fuel tank. Although this volume estimate was not included in the 1999 Remedial Investigation Report, estimated volumes of this magnitude have been discussed with the ACHCS.

The recent evaluation and preparation of the geologic cross-sections suggest that the free-phase product is contained within the thin peaty zone located at the base of the former USTs.

Assuming that:

- the free-phase product occurs as a lense-shape pool predominantly within the more permeable layers of this clayey zone,
- the effective porosity of the peaty clay is 15%,
- the permeable portion of the peaty zone (i.e., the fibrous organic detritus) is approximately 25% of the total organic-rich clay zone, and
- using the estimated lateral extent area of 15,000 square feet,

it is reasonable to estimate that the volume of residual free-phase product beneath the site is approximately 2,500 gallons. This calculated free-phase product volume appears to be consistent for a site with a small (350-gallon) leaking UST. Because of the variability of the assumptions used for this calculation, the actual volume of free-phase product may vary significantly from this estimate.

Recommendations for Interim Corrective Action Plan (CAP)

The free-phase product predominantly occurs within a thin, peaty clay zone above the shallow groundwater. The shallow vadose zone (construction fill material) above the free-phase product and immediately beneath the building does not contain significant concentrations of hydrocarbon vapors. As such, soil vapor extraction (SVE) within the vadoze zone would not effectively recover the free-phase product. Also, groundwater extraction (i.e, pump and treat) to enhance the free-phase product recovery from this thin peaty zone would most likely be ineffective. Therefore, passive skimming is proposed for the interim Corrective Action Plan (CAP).

In 1999, a preliminary passive skimming evaluation was successfully performed from three onsite 4-inch diameter wells. Wells TR-4, TR-5, and TR-6 (installed in 1999) are 4-inch diameter wells located within the central-portion of the free-phase product plume where the product appears to be thickest. Those tests indicated that free-phase product can be successfully recovered from those wells at a rate of up to 0.5 gallons per day from each well. Therefore based on the current investigation results, these three existing wells are appropriately placed to recover a majority of the free-phase product and will be used as ongoing product recovery wells.

In addition to the passive free-phase product recovery, the potential for plume migration will be monitored using existing monitoring wells TR-7, TR-8, and TR-9. These monitoring wells were placed and designed for long-term plume stability monitoring.

The product recovery efficiency from each of these wells will be monitored quarterly to evaluate whether alternative recovery techniques (i.e., in-well absorbents) or additional wells are required. Recommendations to modify the interim CAP will be presented in an annual summary report.

A free-phase product recovery and monitoring plan was submitted to the ACHCS on June 3, 2002 for review and comment. When approved, that plan will be implemented as the interim CAP.

If you have any questions regarding this report, please call David Kleesattel at (510) 874-4500, extension 541.

Sincerely,
Treadwell & Rollo, Inc.

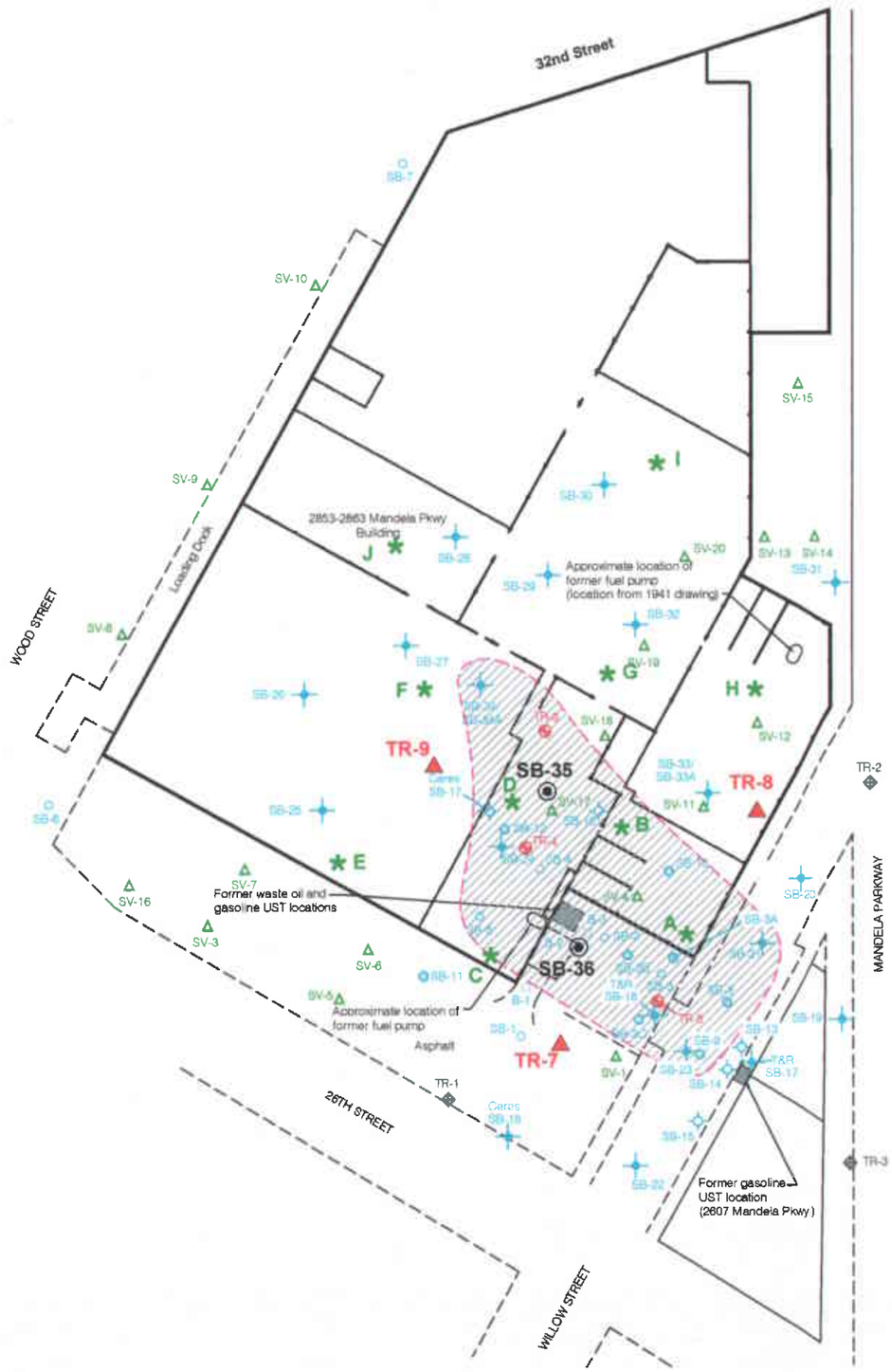
David Kleesattel, R.G.
Senior Geologist

Michael P. McGuire, P.E.
Associate Engineer

25430203.OAK

Attachments: Site Plan
Laboratory Data Sheets
Soil Boring Logs/Well Completion Diagrams
Geologic Cross-Sections

cc: Ms. Faye Beverett
Richard C. Jacobs, Esq.



EXPLANATION

- Soil boring (06/92)
- Soil boring (08/98)
- Soil boring (10/98)
- Soil boring (11/98)
- Soil boring (1999)
- Piezometer (1999)
- Monitoring well (1999)
- Soil vapor sampling (08/98)
- Free product extent based on:
  1 - direct observation of product
  2 - benzene >2000 m g/L
- G ✱ Soil - vapor collection point
- SB-35 ◉ Soil boring
- TR-7 ▲ Free product monitoring piezometer

Note:
Free product may not necessarily be present at all locations within the extent envelope indicated.

0 80 Feet
Approximate scale

References: Ceres Associates, 1998. Interactive Resources, 1999.

2855 MANDELA PARKWAY PROPERTY
Oakland, California

SITE PLAN SHOWING SAMPLING LOCATIONS

Date 06/03/02	Project No. 2543.01	Figure 1

Treadwell&Rollo

PLANNED SAMPLING LOCATIONS V1. 254301.DWG

SunStar Laboratories, Inc.

August 6, 2001

David Kleesattel
Treadwell and Rollo
501 14th Street
3rd Floor
Oakland, CA 94612

SunStar Laboratories Incorporated Batch Number: T-2860

Dear Mr. Kleesattel:

This report contains the analytical results for ten (10) vapor samples received under chain of custody by SunStar Laboratories on August 4, 2001. These samples are associated with your *Mandela Parkway Property / 2543.02* project.

Project Summary

Samples were received in good condition. Sample container(s) and label(s) agreed with the chain of custody as to sample ID, collection time/ date, requested analyses and/or preservatives.

Samples were received in time to meet the method holding time specifications.

All applicable internal quality control analyses including calibration verifications, calibration (instrumentation), method blanks, matrix spike (MS) and matrix spike duplicate (MSD) met method specified acceptance criteria. Any anomalies are reported within the case narrative.

If you require further information or clarification, please feel free to contact us at (714) 505-4010.

Sincerely,

Olivia M.

Reviewer

Vironex Inc.
3002 Dow Ave, Ste. 406
Tustin, CA 92780
1-800-847-6639

Chain of Custody Record

T-2860

Client: Treadwell and Rollo
Address: 501 14th Street 3rd Floor Oakland, 94612
Phone: 510 874 4500 Fax: 510 874 4507
Project Manager: David Kleespattel

Date: 08-03-01 Page: 1 Of 1
Project Name: Mandela Parkway Property
Collector: BM. Client Project #: 2543.02
Batch #: Proposal #: SF10723-1557

Sample ID	Date Sampled	Time	Sample Type	Container Type	EPA 8010	EPA 8020	EPA 8260	EPA 8270	EPA 418.1	EPA 8015M (gasoline)	EPA 8015M (diesel)	EPA 6010/7000 RCRA (8) Metals	EPA 6010/7000 Title 22 Metals	TO-14 BTEX			Laboratory ID #	Preservative	Comments	Total # of containers
SG-E	08-03-01	0950	vapor	1 L Tedlar										X			01	ICE		1
SG-F	08-03-01	1000															02			
SG-I	08-03-01	1045															03			
SG-D	08-03-01	1100															04			
SG-G		1108															05			
SG-J		1014															06			
SG-C		1105															07			
SG-A		1130															08			
SG-B		1138															09			
SG-H		1200															10			

Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
D Sutherland	08-03-01 12:00	Burgess NKM	8/3/01 12:00
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time
		Olivia RO	8/4/01
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time

Total # of containers: 1
Chain of Custody seals Y/N/NA:
Seals intact? Y/N/NA:
Received good condition/cold:

Turn around time:

Notes
* BTEX by 8020

Sample disposal Instructions: Disposal @ $2.00 each ___ Return to client ___ Pickup ___

SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: Method Blank
Date Sampled: NA
Date Received: NA
Date Analyzed: 8/4/01
Laboratory ID: T2860-MB
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	60.6	121

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-E
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-01
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	49.7	99

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-F
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-02
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	55.2	110

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-I
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-03
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	57.8	116

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-D
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-04
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	62.1	124

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-G
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-05
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	55.7	111

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-J
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-06
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	53.5	107

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-C
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-07
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	52.7	105

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-A
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-08
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	49.2	98

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-B
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-09
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	56.5	113

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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SunStar Laboratories, Inc.

Analytical Report EPA 8260

Client: Treadwell and Rollo
Project Manager: David Kleesattel

Project Name
Mandela Parkway Property

Sample ID: SG-H
Date Sampled: 8/3/01
Date Received: 8/4/01
Date Analyzed: 8/4/01
Laboratory ID: T2860-10
Matrix: Air

Surrogate Compounds	Conc.(µg/L)	%Rec.
4-Bromofluorobenzene	53.8	108

Compound	Concentration (µg/L)	RL(µg/L)
Benzene	ND	5
Toluene	ND	5
Ethyl benzene	ND	5
m&p-Xylene	ND	10
o-Xylene	ND	5

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PROJECT:	MANDELA PARKWAY Oakland, California	**Log of Boring SB-35**	PAGE 1 OF 1
Boring location: See Site Plan			Logged by: D. Sutherland
Date started: 6/4/01	Date finished: 6/4/01		
Drilling method: Direct push-geoprobe			
Hammer weight/drop:	Hammer type:		
Sampler: Continuous core			

DEPTH (feet)	SAMPLES: Sample Number	Sample	Blow Count	Recovery (inches)	OVM (ppm)	LITHOLOGY	MATERIAL DESCRIPTION
							Surface Conditions: concrete floor slab
							6 inches concrete
1–4						SW	SAND (SW), 90% recovery gray-brown, dense, moist, some fine to medium gravel, shell fragments wet, gray-brown to brown
5–6						CL	SANDY CLAY (CL) dark gray, soft, wet, soft to stiff, no odor
7					86	OH	PEATY CLAY (OH) dark gray, very stiff, moist, gasoline odor
8–12					227	CL	CLAY (CL) dark gray, medium stiff, moist, gasoline odor, soft, shell fragments at 9.0 feet
13–15					210	CL	SANDY CLAY (CL) light gray, stiff, moist, fine gravel, gasoline odor gray to gray-brown, hard, increase in medium gravel
16–30						SW	SAND (SW) brown, dense, moist, fine to medium sand, no odor

Boring terminated at a depth of 16.0 feet.
Boring backfilled with grout.
During drilling, wet zone potentially indicating perched groundwater encountered at a depth of 3.5 feet.

Treadwell&Rollo

Project No.: 2543.02 | Figure: A-1

TEST ENVIRONMENTAL 254302.GPJ T&R.GDT 9/24/01

PROJECT:	**MANDELA PARKWAY** Oakland, California	**Log of Boring SB-36**	PAGE 1 OF 1

Boring location: See Site Plan		Logged by: D. Sutherland
Date started: 6/4/01	Date finished: 6/4/01	
Drilling method: Direct push-geoprobe		
Hammer weight/drop:	Hammer type:	
Sampler: Continuous core		

DEPTH (feet)	SAMPLES: Sample Number	SAMPLES: Sample	SAMPLES: Blow Count	SAMPLES: Recovery (inches)	OVM (ppm)	LITHOLOGY	MATERIAL DESCRIPTION
							Surface Conditions: concrete pavement
							6 inches concrete
1							CLAYEY GRAVEL (GC) gray, loose, moist, 15% recovery
2							
3							
4					3.3	GC	SANDY CLAY (CL) dark gray, soft, moist, with some gravel and wood fragments
5							
6					13.9		concrete debris, refusal - end of hole
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

FILL

Boring terminated at a depth of 6.0 feet.
Boring backfilled with grout.
Groundwater not encountered at time of drilling.

Treadwell&Rollo

Project No.:	Figure:
2543.02	A-2

TEST ENVIRONMENTAL 254302.GPJ T&R.GDT 9/24/01

PROJECT:	MANDELA PARKWAY Oakland, California	**Log of Boring TR-7**	PAGE 1 OF 1
Boring location: See Site Plan			Logged by: D. Sutherland
Date started: 6/4/01	Date finished: 6/4/01		
Drilling method: Direct push-geoprobe			
Hammer weight/drop:	Hammer type:		
Sampler: Continuous core			

DEPTH (feet)	SAMPLES: Sample Number	SAMPLES: Sample	SAMPLES: Blow Count	SAMPLES: Recovery (feet)	OVM (ppm)	LITHOLOGY	MATERIAL DESCRIPTION	WELL COMPLETION INFORMATION
0							6 inches asphalt pavement	Grout From 0 To 1 Feet
1						GW	GRAVEL (GW) gray, loose, moist, with some clay, (fill)	Blank Casing From 1 To 5 Feet
2						CL	CLAY (CL) dark gray, very stiff, moist, becomes interbedded with sand	
3								Bentonite From 1 To 5 Feet
4						SW	SAND (SW) red-brown, very dense, moist, no odor	
5							wet at 5.5 feet	Screened Casing From 5 To 20 Feet
6								
7						OL	SILTY PEATY CLAY (OL) medium stiff, wet, no odor	
8								
9							CLAY (CL) dark brown, moist, stiff, decrease in plant fragments, no odor	
10								
11						CL		
12							shell fragments at 12.0 feet	
13								Sand From 5 To 22 Feet
14								
15						CL	GRAVELLY CLAY (CL) light gray, stiff, moist, no odor	
16							SANDY CLAY (CL) light gray, very stiff, moist, very fine sand	
17							decreasing sand gray to orange-brown mottling at 16.5 feet	
18						CL		
19								
20								
21						SC	CLAYEY SAND (SC) orange-brown, medium dense sand, moist, gray mottling, no odor	
22								
23								
24								
25								
26								
27								
28								
29								
30								

Boring terminated at a depth of 22.0 feet.

[1] Note: 0.010 inch slotted PVC casing with pre-pack sand.

Treadwell&Rollo

Project No.: 2543.02

Figure: A-3

TEST ENVIRONMENTAL WELL 254302.GPJ T&R.GDT 9/24/01

PROJECT:	MANDELA PARKWAY Oakland, California	Log of Boring TR-8	PAGE 1 OF 1

Boring location: See Site Plan		Logged by: D. Sutherland
Date started: 8/10/01	Date finished: 8/10/01	
Drilling method: Direct push-geoprobe		
Hammer weight/drop:	Hammer type:	
Sampler: Continuous core		

DEPTH (feet)	SAMPLES: Sample Number	SAMPLES: Sample	SAMPLES: Blow Count	SAMPLES: Recovery (feet)	OVM (ppm)	LITHOLOGY	MATERIAL DESCRIPTION	WELL COMPLETION INFORMATION
0							6 inches concrete floor slab	Grout From 0 To 1 Feet
1							0-2 inches gravel	
2						SC	SANDY CLAY (SC) 30% recovery olive-gray, stiff, moist, with some fine to medium gravel	Blank Casing From 1 To 5 Feet
3								Bentonite From 1 To 5 Feet
4							wet at 4.5 feet	
5							CLAY (CL) 100% recovery dark, gray, soft, wet	Screened Casing From 5 To 20 Feet
6								
7						CL		
8								
9								
10							SANDY CLAY (SC) light gray, moist, with trace fine sand, stiff	
11						SC		
12							gray to gray-brown, odor of gasoline	Sand From 5 To 20 Feet
13							▽ wet at 13.0 feet	
14							CLAY (CL) 100% recovery black, soft, wet, some organic matter	
15						CL	increased sand decrease in organic matter	
16							15.5-16.5 slight odor gasoline	
17							SANDY CLAY (SC) 100% recovery light brown, hard, moist, some orange mottling	
18						SC		
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Boring terminated at a depth of 20.0 feet.
During drilling, wet zone potentially indicating groundwater encountered at a depth of 4.5 feet and 13.0 feet.

[1] Note: 0.010 inch slotted PVC casing with pre-pack sand.

Treadwell&Rollo

Project No.: 2543.02

Figure: A-4

TEST ENVIRONMENTAL WELL 254302.GPJ T&R.GDT 9/24/01

PROJECT:	MANDELA PARKWAY Oakland, California	**Log of Monitoring Well TR-9**	PAGE 1 OF 1

Boring location: See Site Plan		Logged by: D. Sutherland
Date started: 6/5/01	Date finished: 6/5/01	
Drilling method: Direct push-geoprobe		
Hammer weight/drop:	Hammer type:	
Sampler: Continuous core		

DEPTH (feet)	SAMPLES: Sample Number	SAMPLES: Sample	SAMPLES: Blow Count	SAMPLES: Recovery (feet)	OVM (ppm)	LITHOLOGY	MATERIAL DESCRIPTION	WELL COMPLETION INFORMATION
							6 inches concrete floor slab	Grout From 0 To 1 Feet
1–2						CL	SANDY CLAY (CL) gray-brown, medium dense, moist, with brick fragments, no odor FILL	Blank Casing From 1 To 6 Feet
3–4						SW	SAND (SW), 85% recovery gray, dense, moist, fine to medium sand, with shell fragments, no odor	Bentonite From 1 To 6 Feet
5–6						CL	CLAY (CL) dark gray, very soft, moist, no odor wet at 5.5 feet	
7–9						OH	ORGANIC CLAY (OH) dark gray, soft, moist, decomposing odor	Screened Casing From 6 To 16 Feet
10					0.0			
11–13						CL	CLAY (CL) dark gray, very soft, moist, with trace fine sand, no odor	Sand From 6 To 16 Feet
14							▽ wet at 14.0 to 14.5 feet	
15–16							SANDY CLAY (CL) light gray, hard, dry, with fine to medium gravel, brown mottling, shell fragments gray to brown at 15.5 feet	
17–30								

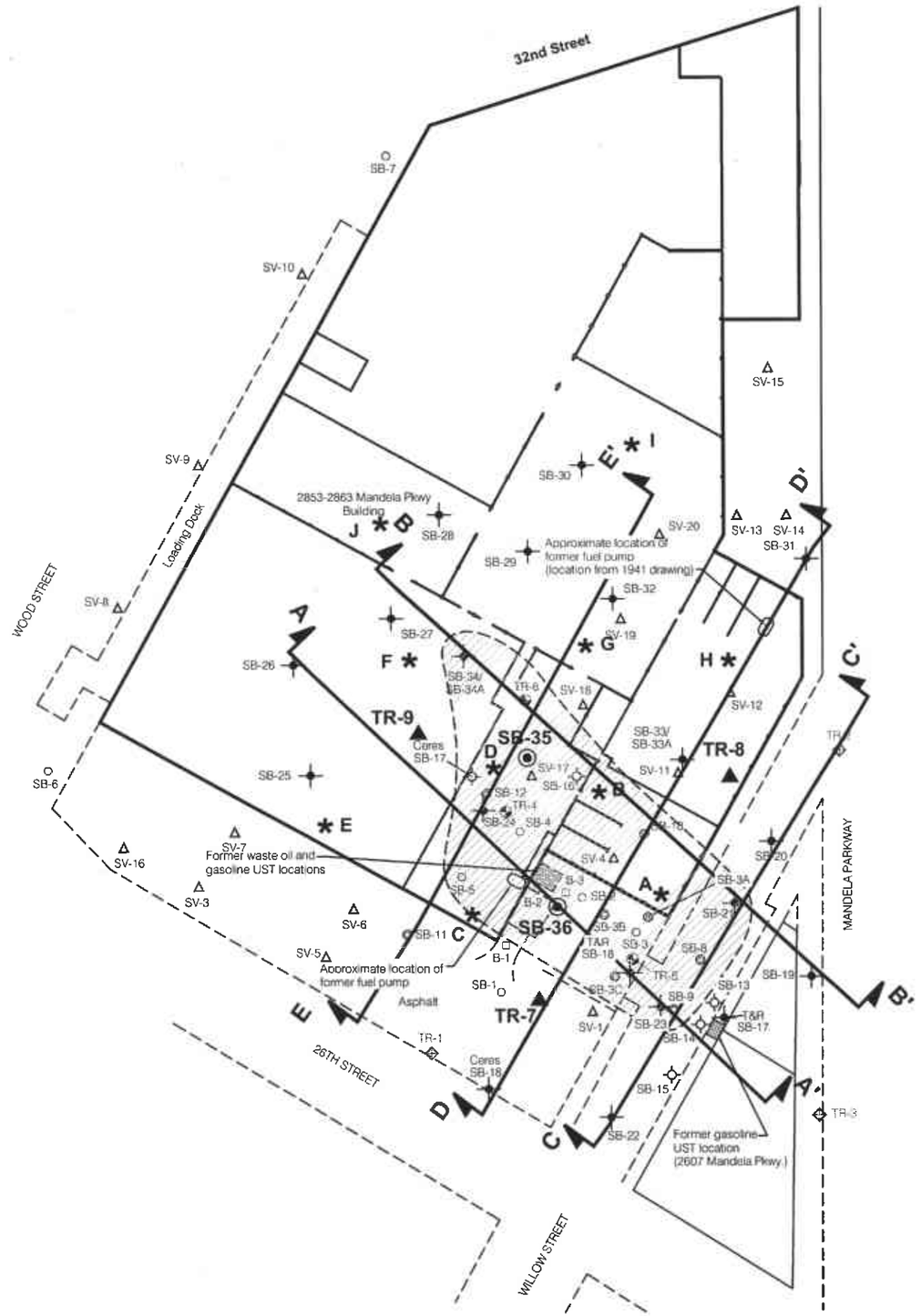
Boring terminated at a depth of 16.0 feet.
During drilling, wet zone potentially indicating groundwater encountered at a depth of 5.5 feet and 14.0 feet.

[1] Note: 0.010 inch slotted PVC casing with pre-pack sand.

Treadwell&Rollo

Project No.:	Figure:
2543.02	A-5

TEST ENVIRONMENTAL WELL 254302.GPJ T&R.GDT 9/24/01



EXPLANATION

- Soil boring (06/92)
- Soil boring (08/98)
- Soil boring (10/98)
- Soil boring (11/98)
- Soil boring (1999)
- Piezometer (1999)
- Monitoring well (1999)
- Soil vapor sampling (08/98)
- Free product extent based on: 1 - direct observation of product 2 - benzene >2000 m g/L
- G ✱ Soil - vapor collection point
- SB-35 Soil boring
- TR-7 Free product monitoring piezometer
- A — A' Idealized cross section location

Note:
Free product may not necessarily be present at all locations within the extent envelope indicated.

0 80 Feet
Approximate scale

2855 MANDELA PARKWAY PROPERTY
Oakland, California

CROSS-SECTION LOCATIONS

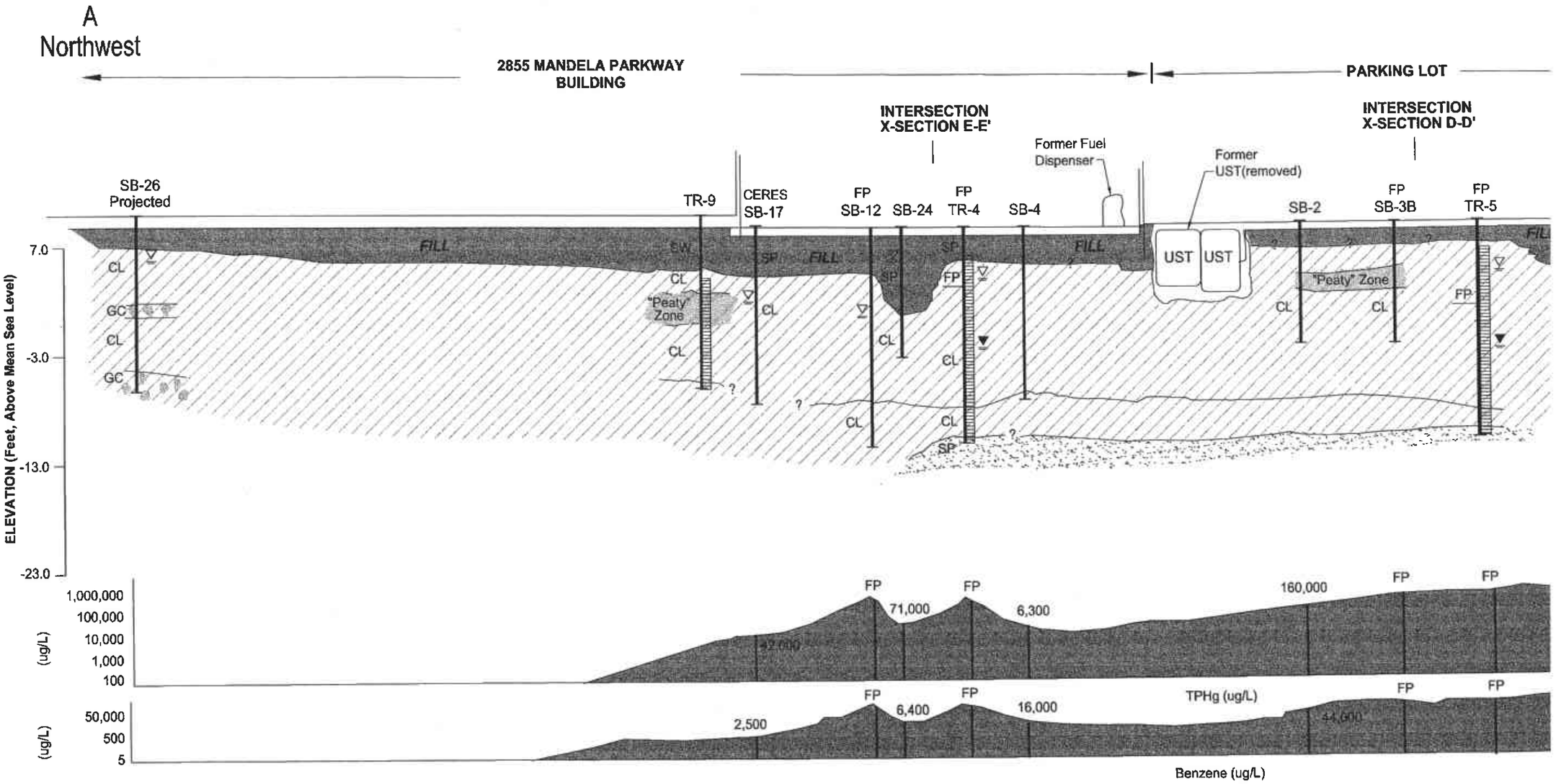
Date 05/09/02	Project No. 2543.01	Figure 1

Treadwell&Rollo

References: Ceres Associates, 1998. Interactive Resources, 1999.

PLANNED SAMPLING LOCATIONS V1 254301.DWG

A
Northwest



LEGEND

- ▼ Groundwater first encountered
- ▽ Stabilized groundwater level
- FP = Free - phase product
- (ug/L) = Micrograms per liter (parts per billion)
- Monitoring well showing screened interval
- GC = Clayey gravel
- SW = Well-sorted sand
- SP = Poorly-sorted sand
- CL = Clay (lean, low plasticity)
- CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

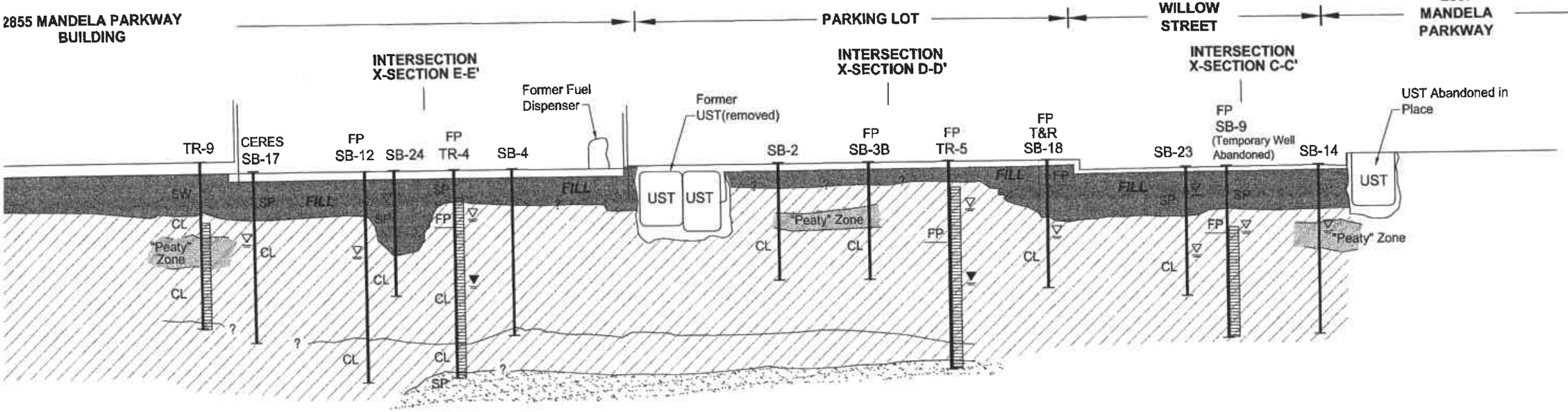
254301_CROSSSECTION_A-A'.DWG

A'
Southeast

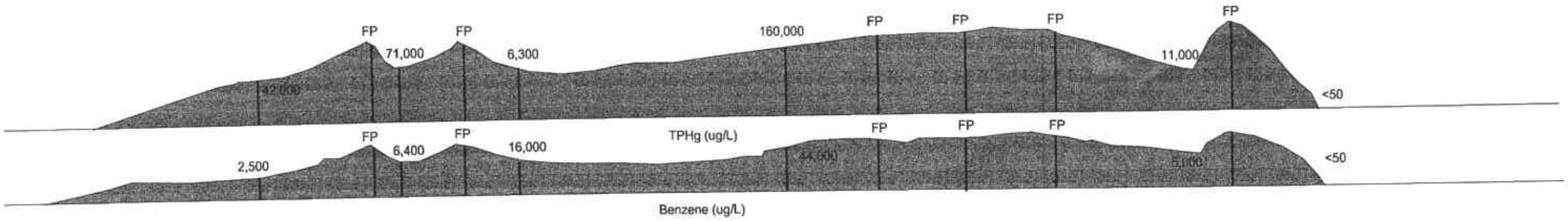
2855 MANDELA PARKWAY BUILDING | PARKING LOT | WILLOW STREET | 2667 MANDELA PARKWAY

INTERSECTION X-SECTION E-E' | INTERSECTION X-SECTION D-D' | INTERSECTION X-SECTION C-C'

TR-9 | CERES SB-17 | FP SB-12 | SB-24 | FP TR-4 | SB-4 | Former Fuel Dispenser | Former UST(removed) | SB-2 | FP SB-3B | FP TR-5 | FP T&R SB-18 | SB-23 | FP SB-9 (Temporary Well Abandoned) | SB-14 | UST Abandoned in Place



ELEVATION (Feet, Above Mean Sea Level)
7.0
-3.0
-13.0
-23.0



TPHg (ug/L)

Benzene (ug/L)

LEGEND

GC = Clayey gravel
SW = Well-sorted sand
SP = Poorly-sorted sand
CL = Clay (lean, low plasticity)
CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

10 Feet
0
0 20 Feet
Approximate Scale

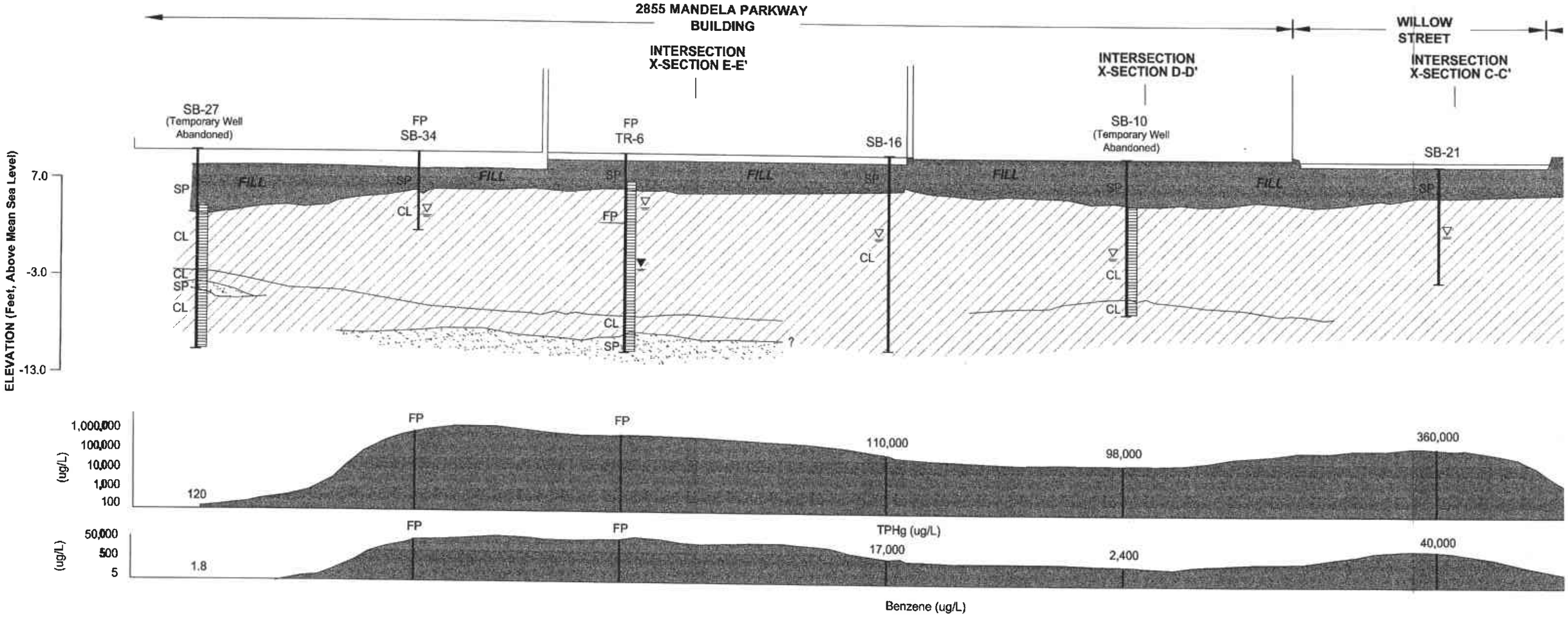
2855 MANDELA PARKWAY PROPERTY
Oakland, California

GENERALIZED GEOLOGIC CROSS SECTION AND CHEMICAL PROFILE A-A'

Date 05/09/02 | Project No. 2543.01 | Figure 2

Treadwell&Rollo

B
Northwest



LEGEND

- Groundwater first encountered
- Stabilized groundwater level
- FP = Free - phase product
- (ug/L) = Micrograms per liter (parts per billion)
- Monitoring well showing screened interval

GC = Clayey gravel
SW = Well-sorted sand
SP = Poorly-sorted sand
CL = Clay (lean, low plasticity)
CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

10 Feet
0
0

254301_CROSSSECTION_B-B'.DWG

B'
Southeast

2855 MANDELA PARKWAY BUILDING

INTERSECTION X-SECTION E-E'

INTERSECTION X-SECTION D-D'

WILLOW STREET

INTERSECTION X-SECTION C-C'

2667 MANDELA PARKWAY

MANDELA PARKWAY

FP TR-6

SB-16

SB-10 (Temporary Well Abandoned)

SB-21

SB-19

FILL

SP

FP

CL

SP

?

7.0

-3.0

-13.0

ELEVATION (Feet, Above Mean Sea Level)

FP 110,000 98,000 360,000 <50

TPHg (ug/L)

FP 17,000 2,400 40,000 <0.5

Benzene (ug/L)

C = Clayey gravel
N = Well-sorted sand
P = Poorly-sorted sand
L = Clay (lean, low plasticity)
H = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

10 Feet
0
0 20 Feet
Approximate Scale

2855 MANDELA PARKWAY PROPERTY
Oakland, California

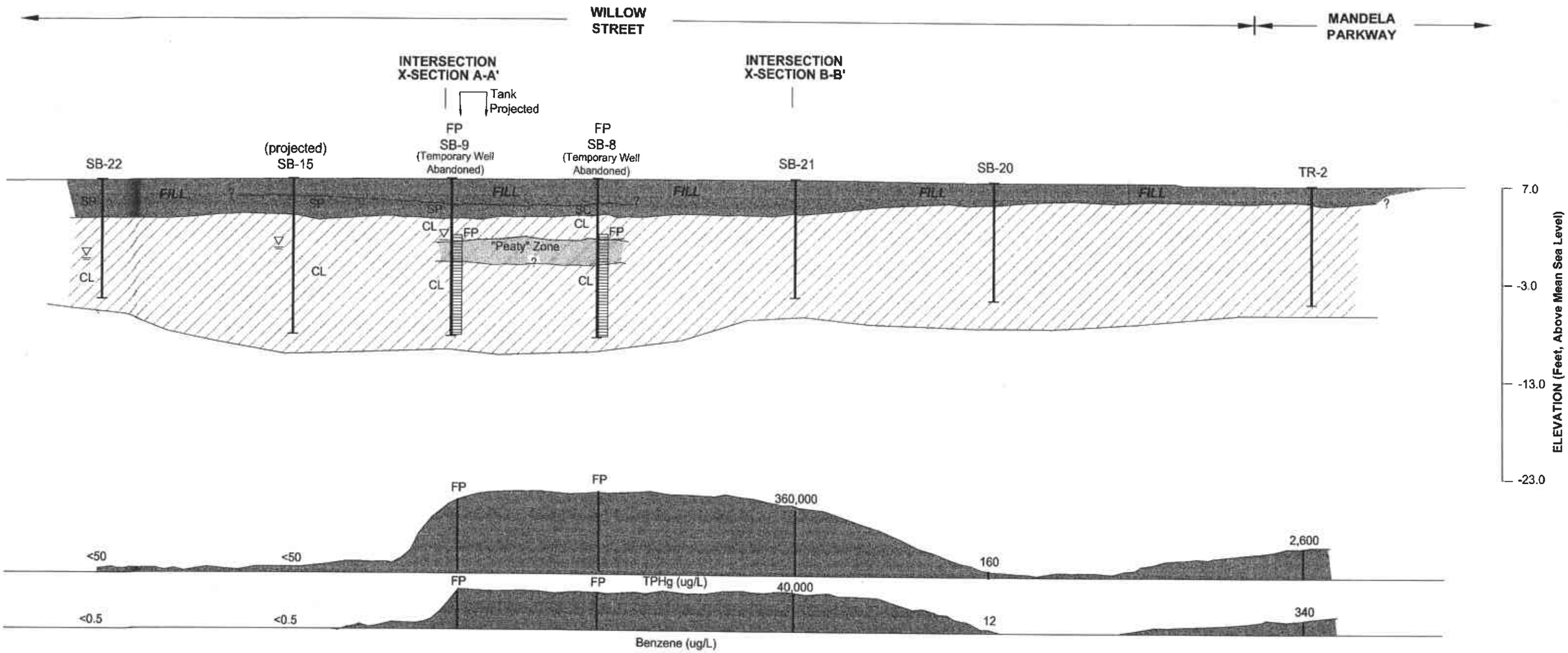
GENERALIZED GEOLOGIC CROSS SECTION AND CHEMICAL PROFILE B-B'

Date 05/09/02 | Project No. 2543.01 | Figure 3

Treadwell&Rollo

/est

C'
Northeast

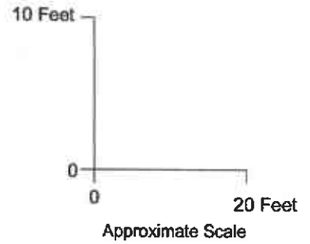


LEGEND

- Groundwater first encountered
- Stabilized groundwater level
- P = Free - phase product
- L) = Micrograms per liter (parts per billion)
- Monitoring well showing screened interval

- GC = Clayey gravel
- SW = Well-sorted sand
- SP = Poorly-sorted sand
- CL = Clay (lean, low plasticity)
- CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.



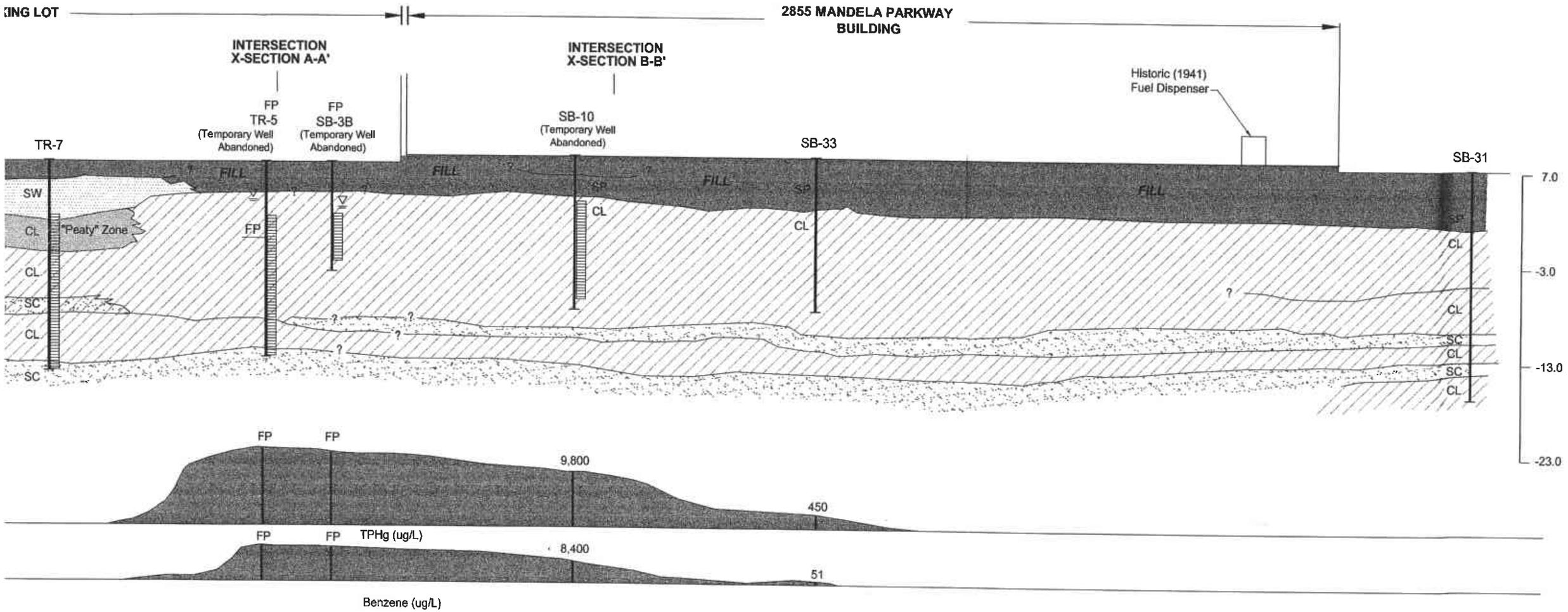
2855 MANDELA PARKWAY PROPERTY
Oakland, California

GENERALIZED GEOLOGIC CROSS SECTION AND CHEMICAL PROFILE C

Date 05/09/02	Project No. 2543.01	Figure

Treadwell&Rollo

D'
Northeast



GC = Clayey gravel
SW = Well-sorted sand
SP = Poorly-sorted sand
CL = Clay (lean, low plasticity)
CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

10 Feet
0
0 20 Feet
Approximate Scale

2855 MANDELA PARKWAY PROPERTY
Oakland, California

GENERALIZED GEOLOGIC CROSS SECTION AND CHEMICAL PROFILE D-

Date 05/09/02	Project No. 2543.01	Figure

Treadwell&Rollo

D
Southwest

26TH STREET

PARKING LOT

2855 MANDELA PARKWAY BUILDING

INTERSECTION X-SECTION A-A'

INTERSECTION X-SECTION B-B'

CERES SB-18

TR-7

FP TR-5 (Temporary Well Abandoned)

FP SB-3B (Temporary Well Abandoned)

SB-10 (Temporary Well Abandoned)

SB-33

ELEVATION (Feet, Above Mean Sea Level)

7.0

-3.0

-13.0

-23.0

FILL

SP

CL

SW

"Peaty" Zone

SC

FP

Benzene (ug/L)

1,000,000
100,000
10,000
1,000
100

<50

FP FP 9,800 450

50,000
500
5

<0.5

FP FP TPHg (ug/L) 8,400 51

LEGEND

- Groundwater first encountered
- Stabilized groundwater level
- FP = Free - phase product
- (ug/L) = Micrograms per liter (parts per billion)
- Monitoring well showing screened interval

GC = Clayey gravel
SW = Well-sorted sand
SP = Poorly-sorted sand
CL = Clay (lean, low plasticity)
CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

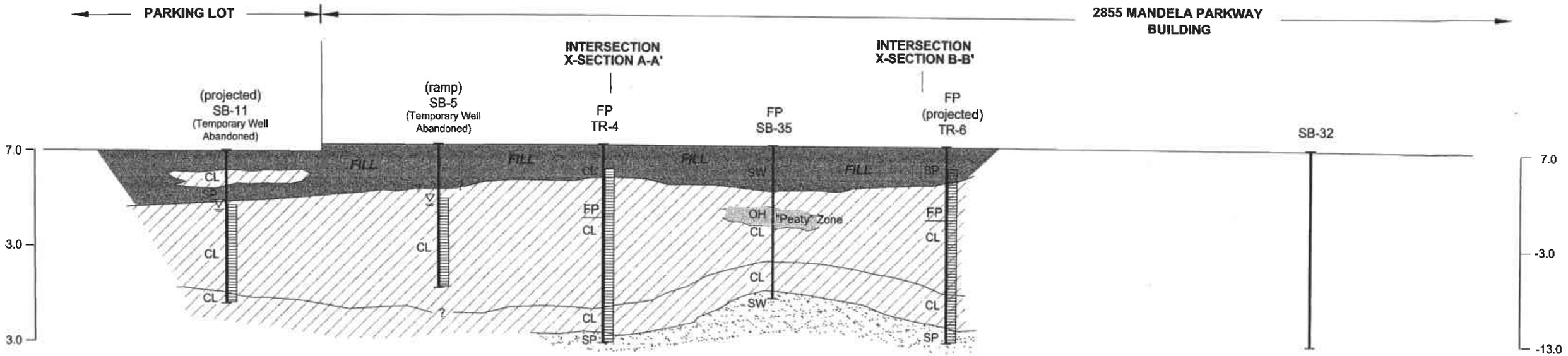
10 Feet

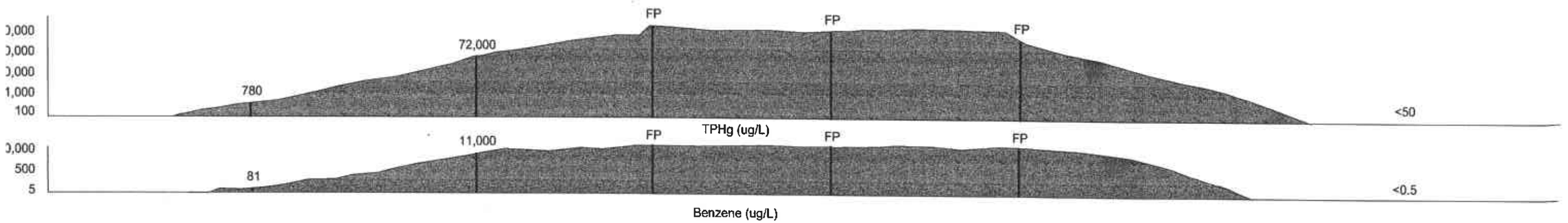
0

254301_CROSSSECTION_D-D'.DWG

E
Southwest

E'
Northeast





LEGEND

- ▼ Groundwater first encountered
- ▽ Stabilized groundwater level
- FP = Free - phase product
- (ug/L) = Micrograms per liter (parts per billion)
- Monitoring well showing screened interval
- GC = Clayey gravel
- SW = Well-sorted sand
- SP = Poorly-sorted sand
- CL = Clay (lean, low plasticity)
- CH = Clay (fat, high plasticity)

Notes:
1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration.
2. Vertical exaggeration = 2x.

10 Feet
0
0
20 Feet
Approximate Scale

2855 MANDELA PARKWAY PROPE
Oakland, California

GENERALIZED GEOLOGIC CROSS SECTION AND CHEMICAL PRO

Date 05/09/02	Project No. 2543.01	F

Treadwell&Ro