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1:50 pm, Mar 12, 2008

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Environmental Health

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19 February 2008
Project No. 2543.01

Mr. Don Huang
Alameda County Health Care Services
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: Project Status Report: Interim Corrective Action Plan Implementation
2855 Mandela Parkway
Oakland, California

Dear Mr. Huang:

On behalf of 2855 Mandela Property LLC, Treadwell & Rollo, Inc. prepared this status report summarizing the implementation of the approved Interim Corrective Action Plan (CAP) for the site located at 2855 Mandela Parkway in Oakland, California. The Interim CAP was submitted on 22 January 2004 and approved by the Alameda County Health Care Services (ACHCS) on 10 February 2004. The purpose of this report is to present a summary of remedial activities associated with the installation of the recovery system and the removal of gasoline (free-phase product) from the groundwater. This work was performed during the period between the Interim CAP approval and the property ownership transfer from 2855 Mandela Property LLC, to 2855 Mandela LLC owned by BALCO Properties LLC.

This work described in this status report was performed for 2855 Mandela Property LLC (the former property owner) and may be funded, in part, by the California State Underground Storage Tank Cleanup Fund (Claim No. 017160) administered by the State Water Resources Control Board.

SITE BACKGROUND AND CONDITIONS

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 operations. The building was originally constructed in 1941 and operated until approximately 1983 by International Harvester as a truck service and sales facility. A 350-gallon underground gasoline storage tank was removed from the property in 1991 by a previous owner (subsequent to International Harvester owning the property), Cypress Property.

Geologic conditions at the site consist of approximately two to eight feet of relatively sandy fill material underlain by native Bay Mud to a depth of at least 24 feet below grade (maximum depth of our investigations). 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 below the ground surface (bgs). There are also 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 free phase product (gasoline) within the Bay Mud and significant concentrations of the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) in groundwater beneath a portion of the property, including under a portion of the existing warehouse building. However, a soil-vapor survey in 1998 detected only relatively low and sporadic benzene concentrations in the shallow soil-gas beneath the building. A sample of the shallow 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.

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These investigation results suggested 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.

Based on additional investigations conducted in 2001, 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 8 feet below the ground surface. The peaty clay zone appears significantly more permeable that the surrounding clay, thereby allowing 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 rather than beneath the entire site.

The volume of free-phase product contained within the thin peaty clay zone is estimated at approximately 2,500 gallons based on an assumed average saturated thickness of the peaty clay zone over an assumed area of about 15,000 square feet. However, the peat zone is discontinuous and the total volume of free-phase product is most likely less than 2,500 gallons. This estimated volume is consistent with the reportedly leaking former 350-gallon UST that was removed from the site.

WORK COMPLETED TO DATE

The following outlines the free phase product recovery system installation, free phase product recovery activities, and planned product monitoring and recovery activities.

FREE PHASE PRODUCT RECOVERY SYSTEM INSTALLATION

The implementation of the Interim CAP was conducted in a phased approach to minimize disrupting building tenants operations, and to allow for initial reimbursement of funds from the California State Underground Storage Tank Cleanup Fund. The initial construction work for the system installation began in June 2004 with the subsequent phases occurring as tenant schedules allowed. Construction of the infrastructure needed for the system was completed in late 2005. Descriptions of the Interim CAP construction phases are presented below.

Phase 1. Installation of Conveyance Piping Inside the Warehouse

The portion of the warehouse where existing recovery wells TR-4 and TR-6 are located (shown on the site plan, Figure 1) was available for installing the pneumatic supply and the double containment free-product conveyance pipelines in February 2004. Cutting the existing floor slab, installing and testing the conveyance piping and restoring the warehouse floor took several weeks due to access limitations. The conveyance piping was connected to the TR-4 and TR-6 well vaults and was extended through the building exterior wall for connection to the aboveground storage tank that was installed under Phase 2 and Phase 3. The conveyance piping was temporarily capped until the other phases described below were completed and the free-phase product recovery system was ready for connection and start up.

Before sealing the conveyance piping trenches, the Oakland Fire Department visited the site on several occasions to inspect the piping and to observe pressure testing of the conveyance pipes. The system passed the Oakland Fire Department inspections (Permit #2004-015) and the trenches were sealed with concrete.

Pneumatic product skimming devices (manufactured by Xitech Corporation, New Mexico) which remove free-phase product only were placed within existing wells TR-4 and TR-6 to recover the free-phase product. These skimmers were successfully used during a pilot study conducted at wells TR-4 and TR-6 in December 2003. The free-phase product skimmers operate using compressed nitrogen, an inert gas, to displace the free phase product in the well. The free phase product flows through double-contained pipes (Teflon® tubes contained within sealed PVC piping) to an aboveground 500-gallon storage tank placed outside of the building (Figure 1). As discussed above, the product conveyance piping was placed in a shallow trench cut into the concrete floor. After the pipes were placed in the trench and tested, new concrete was placed in the trench and the floor surface restored. Free-phase product collected in the storage tank will be disposed or recycled approximately every 60 to 90 days.

The free-phase product skimmers extract product on a calibrated frequency (approximately 3 times per day) which allows for optimum recovery. As discussed above, the existing recovery wells appear to be appropriately placed within the free-phase product plume to recover a majority of the known free-phase product. Several additional wells and/or collection trenches (discussed below and shown on Figure 1) were used to recover the free-phase product.

Phase 2. Installation of Collection Trenches in Parking Area

The tenant who used the parking area where the two proposed collection trenches and aboveground storage tank are located made this area available for construction in November and December 2005. At that time, the collection trenches and the exterior free-product conveyance pipeline trench and pipelines were installed. Additionally, the area where the aboveground storage tank is currently located (Figure 1) was prepared for placing the 250-gallon aboveground storage tank when delivered. A concrete, double containment pad with seismic tie-down bolts was installed for the aboveground storage tank that was installed under Phase 3. The tank location area was prepared by removing the existing concrete and grading the soil to allow for placement of the concrete, double containment pad.

Two collection trenches were constructed in the outside parking area located on the southern corner of the warehouse (Figure 1). The purpose of the collection trenches as part of the interim CAP was to evaluate and compare the free-product recovery efficiency of a trench-based system verses a well-based system. Because the free-phase product primarily resides in a thin, discontinuous peat layer, a trench which intercepts a larger area of the peat layer than a well may be an efficient recovery approach. The recovery data collected during the Interim CAP period (discussed later in this report) allows for an evaluation of whether additional trenches would provide a more cost effective, long-term correction action approach.

The depth of the collection trenches is approximately 10 feet below the ground surface. After excavation, the trenches were backfilled with about five feet of coarse aggregate drain rock such that the drain rock intercepts the peat layer. This allows for the free-phase product to enter the trench and into the permeable rock for removal. A vertical, 4-inch-diameter standpipe was placed in each of the trenches near the end closest to the building. A pneumatic skimming pump, as in the recovery wells, was placed in the vertical standpipes to remove the free-phase product from the trenches.

The system allows for recovered free-phase product from the collection trenches to be conveyed to the aboveground storage tank through underground double-contained pipes. The conveyance piping is placed in a shallow trench connecting the two collection trenches. This conveyance pipe trench is approximately 1 foot deep and was paved with asphalt to match the parking lot surface.

Phase 3. Acquisition of Free Phase Product Recovery Equipment and System Startup

After the recovery system infrastructure was installed, the free-phase product recovery equipment (skimmers, controls, and aboveground storage tank) were acquired and placed on the site. Immediately following equipment installation and testing, the recovery system was started to calibrate the pneumatic pump controls. Because the free-phase product level is site-specific and will fluctuate due to product recharge rates (i.e., the rate at which the free phase product flows into the wells or trenches) and due to groundwater levels, the pump calibration process was expected to take several months to identify the optimum pump settings. As noted in more detail in the Free Phase Product Recovery Activities section below, the recharge rates for the free phase product was slower than anticipated. Therefore, the pump calibration process could not be completed and the recovery system was placed in stand by mode (i.e., shut down and sealed to prevent equipment degradation and failure) to further evaluate the system efficiency (discussed further in Phase 5).

Phase 4. Additional Offsite Well Installation

In accordance with the request by ACHCS (letter dated10 February 2004), two additional offsite monitoring wells were installed in the assumed upgradient direction from the former UST. Wells TR-10 and TR-11 were installed within the curb lane and Willow Street on the opposite side of the street from the site (see Figure 1). Free phase product was detected in monitoring well TR-10, with a maximum thickness measured of approximately seven feet. Free phase product has not been detected in monitoring well TR-11. Further information relative to fluid level measurements is presented in the Free Phase Product Recovery Activities section below.

Phase 5. Development of Collection Trenches

During the installation of the two trenches in November and December 2005, and through most of the 2005-2006 winter, there was above normal rainfall. Although free phase product had been observed in the interior wells (TR-4 and TR-6), as well as the exterior well near the trenches (TR-5), only water was observed in the trenches following installation. Following the last of the 2005-2006 winter rains, the water levels in the two trenches rose to near the ground surface, but have since decreased to approximately 2 feet bgs. The presence of groundwater only observed in the trenches is likely from the shallow perched groundwater zone at the site that has caused the trenches to fill with water to a hydrostatic level above the free phase product in the formation, which appears to inhibit the flow of free phase product into the collection trenches.

To attempt to develop the two collection trenches for free phase product extraction, approximately 3,600 gallons of water were purged from the trenches directly into a vacuum truck for offsite disposal in

March 2006. Because the shallow groundwater in the trench was in direct contact with the free phase product, the water was contaminated by dissolved petroleum hydrocarbons and could not be discharged directly to the sewer or storm drain system without treatment. Following this initial purging, additional perched water has since flowed into the trenches, continuing to prevent free phase product flow into the trenches for recovery. We anticipate that until the perched water level decreases to the level of the "peaty" zone, free phase product will not flow into the trenches.

FREE PHASE PRODUCT RECOVERY ACTIVITIES

The free phase product recovery activities included fluid measurements in the wells and collection trenches, attempted recovery of free phase product from the collection trenches, and recovery of free phase product from wells.

Fluid-Level Measurements

Groundwater levels and free-phase product thickness were measured at the initiation of this free-phase product recovery program. Groundwater elevations were routinely measured in wells TR-4, TR-5, TR-6, TR-10 and TR-11 and from the collection trench riser pipes (RW-1 and RW-2) in the collection trenches since the system installation.

Groundwater levels were measured using an electronic, down-hole water level indicator. Free-phase product thickness was measured using an electronic oil/water interface probe. These fluid-level indicators are accurate to the nearest 0.01 foot. Water level measurements are reported to an accuracy of 0.01-foot mean sea level. Because the primary goal of the system is recovery of free phase product from the subsurface, water levels and free phase product thickness were measured but groundwater samples were not routinely collected for analysis.

The fluid level data are summarized on Table 1. The free phase product thickness, where detected, ranges from a few tenths of a foot (TR-4) to approximately seven feet (TR-10). As the free phase product has been removed (discussed below), the subsequent thickness measured in the wells has been decreasing. The water levels in the trench riser pipes (RW-1 and RW-2) has decreased since the collection trench development activities but remains high enough to prevent the flow of free phase product into the recovery trenches.

Free-Phase Product Recovery from Existing Wells

Under static conditions (non-recovery), free-phase product accumulates in wells TR-4, TR-5, TR-6, and TR-10. Because the free-phase product apparently flows into the wells from the thin relatively permeable "peaty" zone at about 7 feet below the ground surface, which is located approximately near the top of the groundwater surface, a significant thickness of free phase product (up to 12 feet) can accumulate some wells. Based on the product recovery tests performed in 1999 and 2003, we previously estimated that free-phase product would initially flow into each of the recovery wells at a rate of about 0.1 to 0.5 gallons per day. Therefore, it was expected that approximately 3 to 4 weeks was required for the free-product to reach to equilibrium thickness after the product is removed from the well. Since long-term free phase product removal was initiated, the recovery rates from the wells have decreased to approximately 0.1 to 0.5 gallons per week, which is slower than originally anticipated.

Because the free-phase product is apparently localized within the shallow thin permeable zone near the water table, groundwater extraction to temporarily lower the water table is not expected to significantly enhance free-phase product recovery (i.e., an induced hydraulic cone-of-depression will not enhance product flow into the recovery wells).

Because the free phase product flow into the recovery wells has been slower than expected and the perched water in the trench collection area has not allowed the inflow of free phase product into the trenches, product recovery has been performed by routinely bailing the wells manually. In 1999, approximately 98 gallons of product were removed from the wells. Between 1999 and February 2004, approximately 22 additional gallons of product were removed. From February 2004 to July 2006, 17 gallons of product were removed. Therefore a total of approximately 137 gallons of product has been removed to date. The routine bailing continues, but the volume available for recovery may continue to decrease as the groundwater levels remain high.

The free phase product inflow rate in the wells is expected continue to decrease as the overall mass and volume of free-phase product is reduced. The skimmers will remain in the recovery wells until free phase product can no longer be removed using this technique. After the skimmers have been removed, techniques to further reduce hydrocarbons will be evaluated. The evaluation will consider installing hydrocarbon absorbents within the 4-inch-diameter wells to collect residual thin free-phase product layers or sheen.

Free-Phase Product Recovery from Collection Trenches

The water level in the trenches continues to be monitored. Free phase product has not been detected in the trenches because of the high water levels (caused by the shallow perched water zone). If free phase product is detected in either of the collection trenches riser pipes, the free phase product will be removed using either the skimmer pumps or by manual bailing (depending on the sustainable inflow rate).

Free-Phase Product Disposal

All free-phase product removed from the subsurface is disposed or recycled offsite at a licensed facility. The product is containerized as it is removed from the wells, and stored onsite in the approved 250-gallon aboveground fuel-storage storage tank (Convault) until recycling is ranged. The free-phase product is handled according to requirements specified in a hazardous materials permit obtained from the local fire department.

PLANNED FREE PHASE PRODUCT MONITORING AND REMOVAL

The current process to remove free phase product (routine manual bailing from the existing wells) will continue until no free phase product can be removed by bailing. If free phase product is detected in the trenches, the product will be removed by bailing. If site conditions change and the thickness of product increases in the wells that have recovery pumps, then the recovery system will be activated for continuous product removal.

Thank you for your time and review of this project. If you have any questions regarding this status report, please call Glenn Leong at (510) 874-4500, extension 554.

Sincerely,
TREADWELL & ROLLO, INC.

PROFESSIONAL GEOLOGIST
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David R. Kleesattel, R.G.
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Senior Associate

Attachments: Figure 1 - Site Plan
Table 1 - Fluid level Monitoring Data

cc: Ms. Faye Beverett

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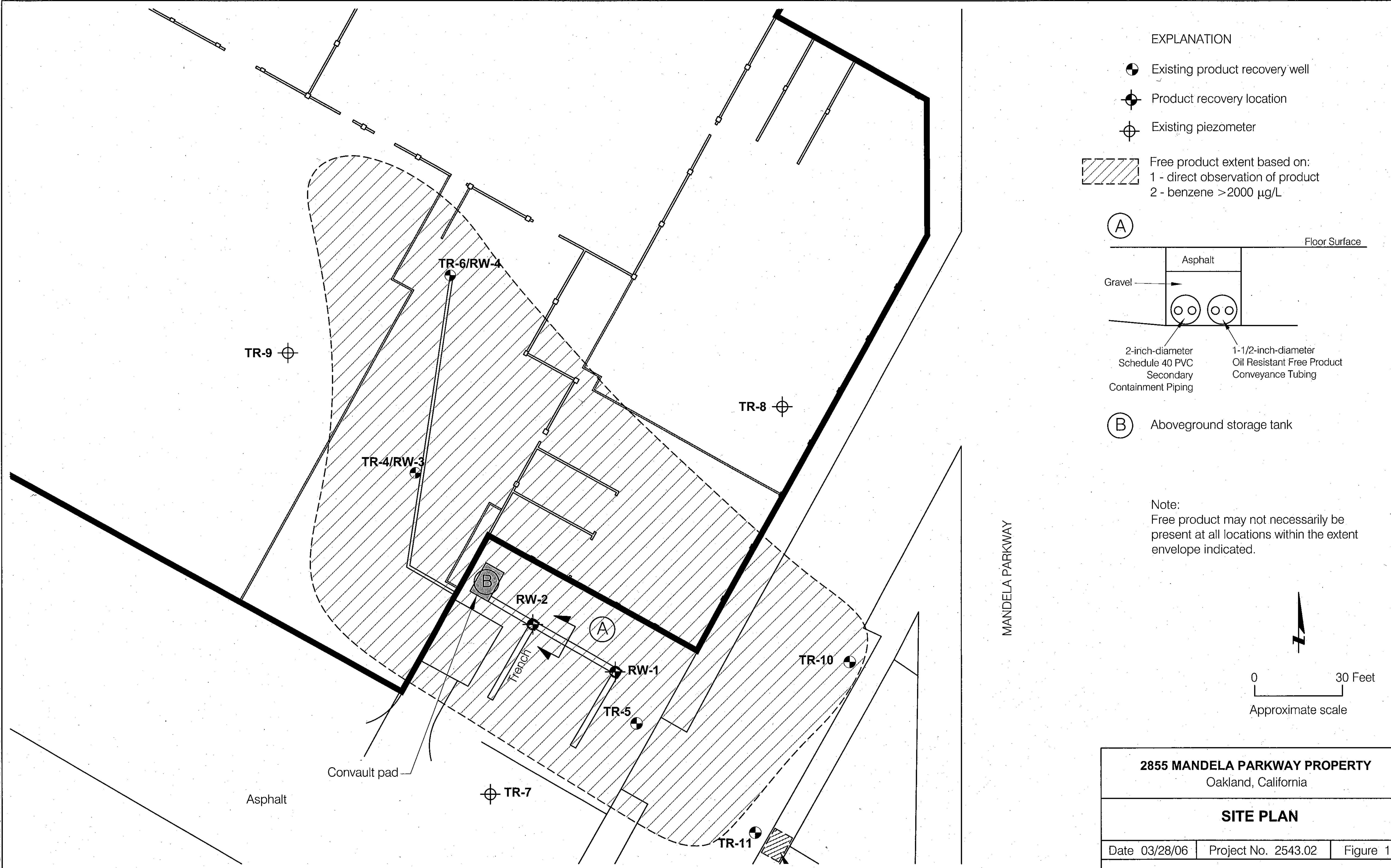
FIGURE



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

254302 PLANNED SAMPLING LOCATIONS V2 DWG.

2855 MANDELA PARKWAY PROPERTY
Oakland, California

SITE PLAN

Date 03/28/06	Project No. 2543.02	Figure 1

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TABLE

Table 1. MANDELA PARKWAY WELL MEASUREMENTS - 2006

	Inside Property Boundary/Building Exterior						Inside Property Boundary/Building Interior			Inside Property Boundary/Building Exterior			Inside Property Boundary/Building Exterior			Outside Property Boundary/On Willow Street					
DATE	RW-1 DTP	RW-1 DTW	Product Thickness	RW-2 DTP	RW-2 DTW	Product Thickness	TR-4 DTP	TR-4 DTW	Product Thickness	TR-5 DTP	TR-5 DTW	Product Thickness	TR-6 DTP	TR-6 DTW	Product Thickness	TR-10 DTP	TR-10 DTW	Product Thickness	TR -11 DTP	TR-11 DTW	Product Thickness
12/23/2005	ND	0.60	0.00	ND	0.70	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2/13/2005	NM	NM	NM	ND	2.00	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
3/10/2006	ND	0.16	0.00	ND	0.16	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
3/13/2006	ND	0.41	0.00	ND	0.42	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
3/21/2006	ND	0.00	0.00	ND	0.20	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
3/29/2006	ND	0.00	0.00	ND	0.00	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
3/31/2006	ND	0.20	0.00	ND	0.25	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4/27/2006	ND	1.07	0.00	ND	1.06	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
5/15/2006	ND	1.45	0.00	ND	1.51	0.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
7/11/2006	ND	1.95	0.00	ND	2.02	0.00	**3.82**	**6.77**	**2.95**	NM	NM	NM	**7.77**	**13.35**	**5.58**	NM	NM	NM	NM	NM	NM
7/26/2006	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	8.86	9.25	0.39	NM	NM	NM	NM	NM	NM
8/1/2006	NM	NM	NM	NM	NM	NM	NM	NM	NM	**7.58**	**10.88**	**3.30**	NM	NM	NM	NM	NM	NM	NM	NM	NM
8/4/2006	NM	NM	NM	NM	NM	NM	NM	NM	NM	8.03	8.72	0.69	NM	NM	NM	NM	NM	NM	NM	NM	NM
8/10/2006	NM	NM	NM	NM	NM	NM	NM	NM	NM	8.13	8.82	0.69	NM	NM	NM	NM	NM	NM	NM	NM	NM
8/25/2006	NM	NM	NM	NM	NM	NM	NM	NM	NM	ND	8.17	0.00	NM	NM	NM	**9.73**	**16.30**	**6.57**	NM	NM	NM
9/12/2006	ND	2.33	0.00	ND	2.47	0.00	NM	NM	NM	8.39	9.03	0.64	NM	NM	NM	NM	NM	NM	NM	NM	NM
9/21/2006	ND	2.38	0.00	ND	2.57	0.00	NM	NM	NM	8.48	9.07	0.59	NM	NM	NM	ND	9.49	0.00	NM	NM	NM
10/3/2006	ND	2.34	0.00	ND	2.55	0.00	NM	NM	NM	8.40	9.11	0.71	NM	NM	NM	ND	9.25	0.00	NM	NM	NM
10/13/2006	ND	2.10	0.00	ND	2.23	0.00	NM	NM	NM	8.38	9.02	0.64	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/20/2006	ND	2.23	0.00	ND	2.36	0.00	NM	NM	NM	8.56	9.16	0.60	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/24/2006	ND	2.29	0.00	ND	2.41	0.00	5.60	5.95	0.35	8.58	9.15	0.57	9.48	10.05	0.57	NM	NM	NM	ND	10.62	NM

Notes
ND = Not detected
NM = Not Measured
[box] System Run for free product removal