

**STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
320 West 4th Street, Suite 200, Los Angeles, California 90013**

**FACT SHEET
WASTE DISCHARGE REQUIREMENTS
FOR**

GROUNDWATER REMEDIATION PILOT TEST USING IN-SITU CHEMICAL OXIDATION

AT

**PROPOSED CENTRAL REGION ELEMENTARY SCHOOL #13
LOS ANGELES UNIFIED SCHOOL DISTRICT (LAUSD)
3200 WEST WASHINGTON BOULEVARD
LOS ANGELES, CA 90018
(FILE NUMBER 09-192; DTSC SITE CODE: 304490)**

ORDER NO. R4-2007-0019, SERIES 119, CI-9579

FACILITY ADDRESS

Central Region Elementary School #13 (CRES #13)
3200 West Washington Boulevard
Los Angeles, California 90018

FACILITY MAILING ADDRESS

Mr. Christer Loftenius
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Los Angeles Unified School District
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Los Angeles, California 90017

SITE DESCRIPTION AND BACKGROUND

The Los Angeles Unified School District (LAUSD) Central Region Elementary School #13 (CRES #13) (site) is located at latitude N 34° 2' 22.6", longitude W 118° 19' 8.0". The site is approximately 3.34 acres in size and is bounded by West Washington Boulevard to the North, a Chevron Station to the east, residences to the south, and 3rd Avenue to the west, in the city of Los Angeles, California. The CRES #13 is currently under construction and scheduled to open in the fall of 2010 (Figure 1).

The Department of Toxic Substances Control (DTSC) is the lead agency overseeing site assessment and remediation. During the site investigation process, the site was divided into two portions (Area A and Area B). Later, Area B was further divided into Areas B1 and B2 (see Figure 2) to provide flexibility in implementing cleanup and achieving site closure. Area B2, which is the area of concern for the BIOX overspray, occupies the Assessor's Parcel Numbers 5060-031-900, 5060-031-901, 5060-031-903. The DTSC provided a determination of No Further Action for Area A on August 8, 2008.

Area B2 will be used as a playing or recreational field just east of the proposed school building, which is currently under construction. The total square footage of Area B2 is approximately 21,000 square feet (ft²). The proposed pilot test will be conducted in Area B2 in an overspray area of 3,325 ft² (approximately 53 ft by 60 ft). Although the area of remediation is shown slightly larger on Figure 3, only the deepest areas of excavation (45 ft below grade), which are within the A1-zone capillary fringe, will be targeted for treatment (Figure 4).

HYDROGEOLOGY

Three groundwater zones were identified at the site: 1) the A1-zone (perched, occurring at approximately 46-56 ft below ground surface (bgs)); 2) the A-zone (perched, occurring at approximately 72-80 ft bgs), and 3) the B-

zone (occurring at approximately 119-122.5 ft bgs). The pilot test will target the capillary fringe and first encountered groundwater of the A1-perched zone at approximately 45 feet bgs.

According to the Department of Water Resources (DWR) (Bulletin No. 104, 1961), the regional hydrologic setting surrounding the site is comprised of a semiperched aquifer, the underlying Bellflower aquiclude, and the deeper Exposition aquifer. The semiperched aquifer appears to correlate with the A1-groundwater zone found at the site. The A-zone found on site may be representative of saturated sandy lenses within the Bellflower aquiclude. Underlying the Bellflower aquiclude is the Exposition aquifer. The B-zone, first encountered at approximately 120 feet bgs at the site, is believed to correlate with the first groundwater occurrence in the Exposition aquifer.

ENVIRONMENTAL INVESTIGATION AND REMEDIATION IN AREA B2

Seventeen underground storage tanks (USTs) were removed from Area B2 under the oversight of the DTSC and the Los Angeles County Fire Department (LACFD). Soil, soil gas, and groundwater investigations concluded that impacts to the vadose zone and groundwater are attributable in part to leaks from the former on-site USTs and to potential contributing off-site sources.

Analytical results indicate that total petroleum hydrocarbons (TPH) and associated compounds have impacted the vadose zone and the A1-zone groundwater. Similarly, TPH and associated compounds have impacted the A-zone. Low detections of TPH were also detected in several B-zone zone wells. Chlorinated solvents, in particular tetrachloroethylene (PCE), have been detected in soils directly beneath several of the former on-site USTs and have impacted the A-1 groundwater zone. The highest detections in groundwater encountered at the site for these contaminants are: 430 µg/L of benzene in the A-zone, 440 µg/L of toluene in the A1-zone, 550 µg/L of ethylbenzene in the A1-zone, 3,100 µg/L of xylenes in the A-zone, 84 µg/L of PCE in the A-zone, 160 µg/L of DCE in the A-zone, 58 µg/L of vinyl chloride in the A1-zone, 690 µg/L of 1,2,4-trimethyl benzene (TMB) in the A-zone, and 170 µg/L of naphthalene in the A-zone.

Additionally, light non-aqueous phase liquid (LNAPL) has been encountered in the capillary fringe of the A1 and A-zones. Currently, an Interim Remedial Measure, the use of SoakEase absorbent socks, is being implemented at the site for the removal of LNAPL at the A1 and A groundwater zones. To date, approximately 18.3 gallons of free product have been recovered from the A1-zone and approximately 6.2 gallons from the A-zone. During the most recent monitoring event, free product levels were reduced to a sheen observed on top of the water. The over-spray of BIOX® during the proposed pilot test will address the residual LNAPL.

The Remedial Action Plan (RAP) proposes to remediate impacted soil in the B2 area by excavation and off-site treatment and/or disposal. The excavation will extend to the top of the capillary fringe of the A1 groundwater zone (approximately 45 feet below ground surface). Figure 3 depicts the boundaries and depths of the proposed excavation in Area B2. Concurrent with the excavation activities, the LAUSD proposes to spray BIOX®, a proprietary mix of chemical oxidants, at the bottom of the deep soil excavation. Figure 4 shows the approximate area where BIOX® will be over-sprayed. Following the application of BIOX®, the excavation will be backfilled with clean soil. This one-time spray application, considered a pilot test, will address petroleum hydrocarbons and volatile organic compounds in the exposed shallow perched groundwater of zone A1. The effectiveness of BIOX® will be evaluated under this pilot test to determine its use in future groundwater treatment at deeper groundwater zones using injection wells as a delivery method.

VOLUME AND DESCRIPTION OF DISCHARGE (OVER-SPRAY)

A one-time over-spray application of BIOX® at the bottom of the excavation will address the top of the capillary fringe of the first encountered groundwater at approximately 45 feet below ground surface (A1-zone). The applied solution will consist approximately of 1794 pounds of BIOX® compounds blended with 966

gallons of potable water. The overspray area size is approximately 3,325 ft² (approximately 53 ft by 60 ft)(Figure 4).

Groundwater in the A1-zone has been characterized as perched and discontinuous. Therefore, the migration of BIOX® outside the treatment area is not expected. For compliance with this Order, sixteen groundwater monitoring wells, screened in the three different groundwater zones, will be used. The following clusters of wells (refer to Figure 4) target groundwater zones A1, A, and B, the screen interval in feet below ground surface is in parenthesis:

- 1) Monitoring wells C13-CL4A (45.5-50.5), C13-CL2A (66-76), and C13-CL2B (112-122) are located up-gradient of the BIOX® application zone;
- 2) Monitoring wells C13-GW12A1 (48.1-53.1), C13-GW12A (79.5-84.5), and C13-GW12B (121-131) are located down-gradient of the BIOX® application zone;
- 3) Monitoring wells C13-CL6A (52-57), C13-GW1 (73-78), and C13-CL6B (121-131) are located cross-gradient and west of the BIOX® application zone; and
- 4) Monitoring wells (to be installed) C13-GW20A1 (estimated 42-47) and C13-GW20A (estimated 71-76) are located cross-gradient/down-gradient, immediately south of the BIOX® application area. These wells will act as capture wells if migration of BIOX® outside the treatment area is observed. The final screen intervals will be established based on field conditions.
- 5) Monitoring wells C13-GW11A1 (43.5-48.5), C13-GW16A1 (42.3-47.3), C13-GW11A (71-76), and C13-GW16A (70-75) are located within the area of treatment. These monitoring wells will be destroyed during the excavation process, and will be re-installed after back-filling.

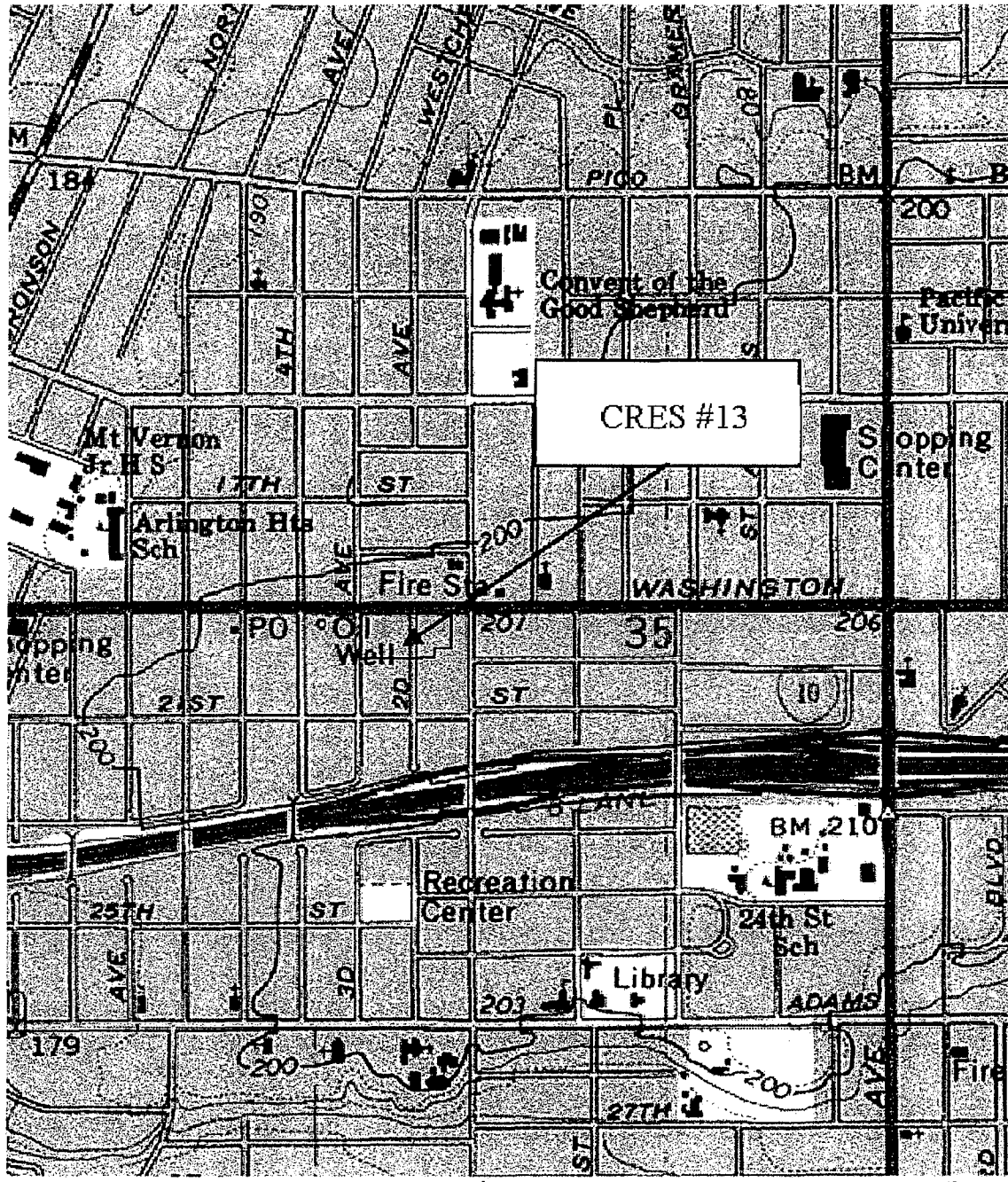
In accordance to the submitted Contingency Plan, monitoring wells C13-CL6A, C13-GW3, C13-GW20A1, C13-GW20A, C13-GW12A1 and C13-GW12A, will be used as sentinel/recovery wells.

The total volume, concentration and quantity of BIOX® are required to be documented per Monitoring and Reporting Program (MRP) No. CI-9579.

One week before the pilot test, groundwater monitoring will be conducted at all the above mentioned monitoring wells to document baseline conditions in accordance with the MRP No. CI-9579.

Upon reviewing of the results of the pilot test and the effectiveness of BIOX® at the site, an expansion of the groundwater treatment may be proposed under this WDR.

A report will be prepared and submitted to the Regional Board summarizing the results of the pilot test and including a description of the methods and procedures, monitoring data, and lab data.



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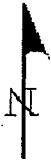
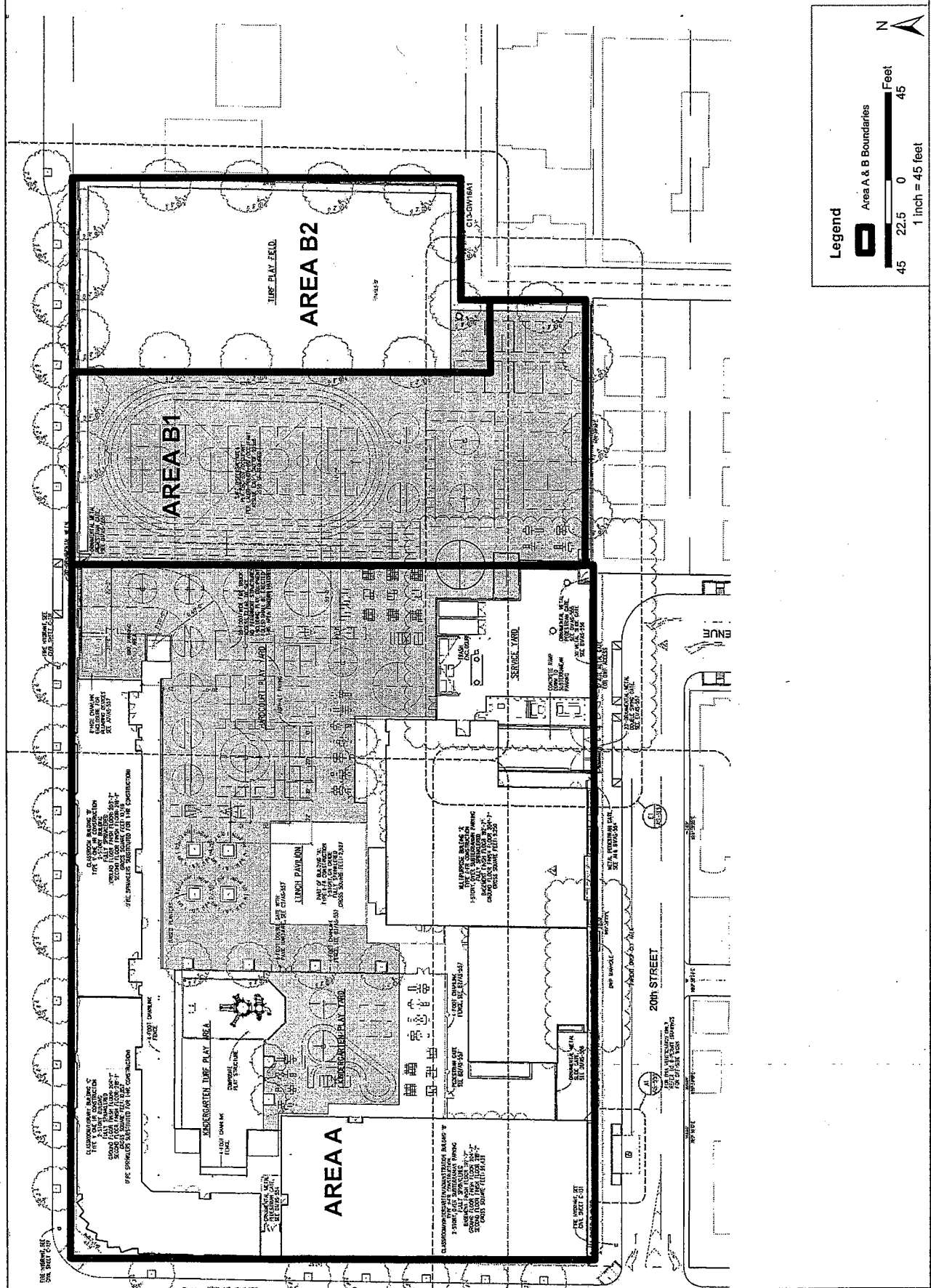


Figure 1
Site Vicinity Map
Central Region Elementary School #13 – Site #7
Los Angeles, California

REV	1
FIGURE	2
PROPOSED SCHOOL LAYOUT AND AREA BOUNDARIES	
LAUSD Central Region Elementary School #13	
PASADENA, CA	
PARSONS	
Job No. (44875)	0 07/30/2008
Designed	0 07/30/2008
Drawn	0 07/30/2008
Checked	0 02/18/2010
Reviewed	0 02/18/2010
Approved	0 02/18/2010
GLP	
GLP	
RGS	
SO	
MB	
TW	



Legend

Area A & B Boundaries

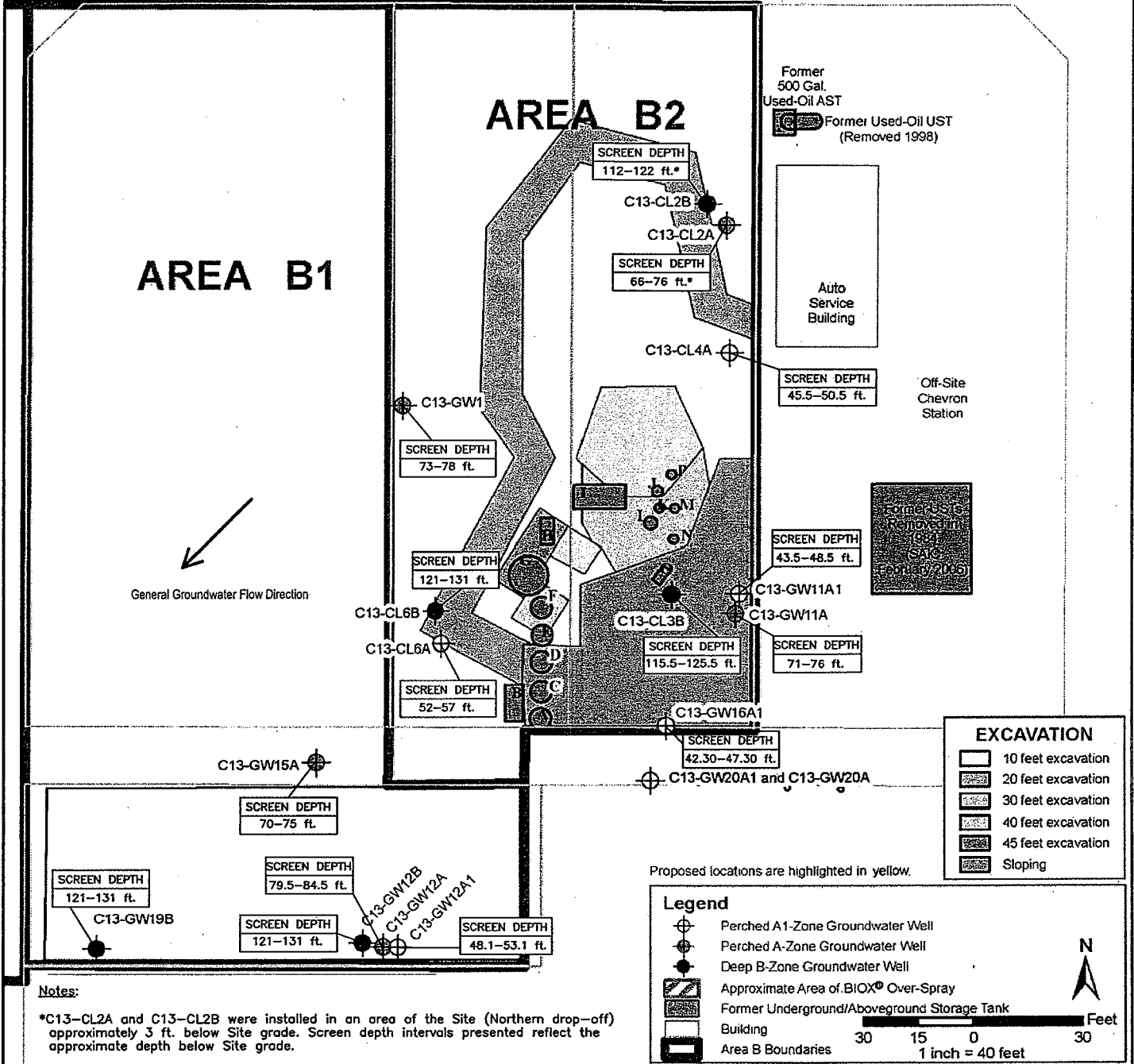
45 22.5 0 45 Feet

1 inch = 45 feet

N

WASHINGTON BOULEVARD

SIDEWALK



Notes:
 *C13-CL2A and C13-CL2B were installed in an area of the Site (Northern drop-off) approximately 3 ft. below Site grade. Screen depth intervals presented reflect the approximate depth below Site grade.

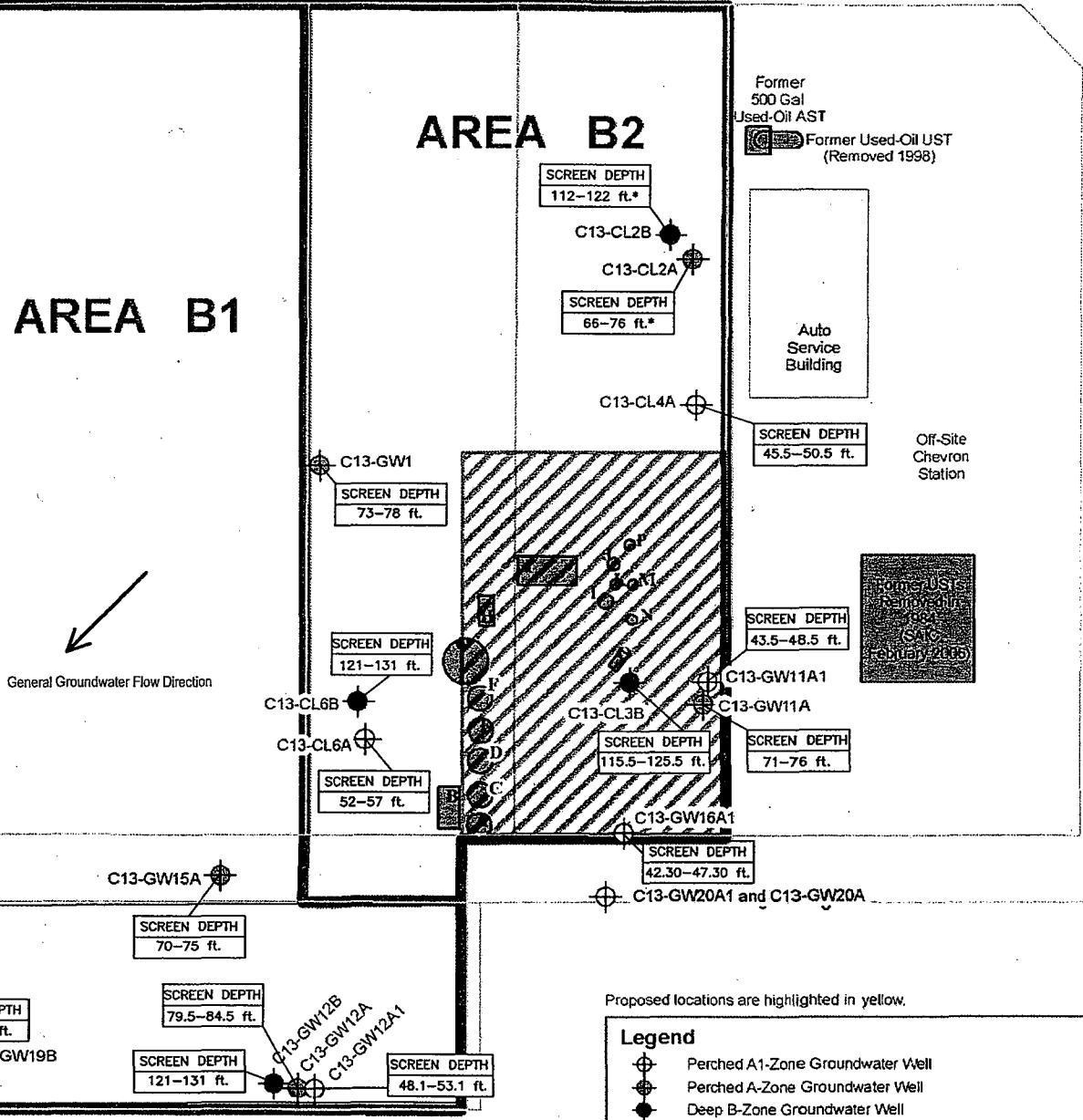
3 FIGURE 1 REV	OU1 PROPOSED EXCAVATION AREA AND SELECT MONITORING WELLS	LAUSD Central Region Elementary School #13	PARSONS Pasadena, CA	Job No. (440875)			
				Designed	1	07/30/2008	
				Drawn	1	08/18/2009	GLP
				Revised	1	2/11/2010	RS
				Checked	1	2/11/2010	SO
				Reviewed	1	2/11/2010	MB
				Approved	1	2/11/2010	TW

WASHINGTON BOULEVARD

SIDEWALK

AREA B1

AREA B2



General Groundwater Flow Direction

Proposed locations are highlighted in yellow.

Legend

- Perched A1-Zone Groundwater Well
- Perched A-Zone Groundwater Well
- Deep B-Zone Groundwater Well
- Approximate Area of BIOX® Over-Spray
- Former Underground/Aboveground Storage Tank
- Building
- Area B Boundaries

Scale: 1 inch = 40 feet

Notes:

*C13-CL2A and C13-CL2B were installed in an area of the Site (Northern drop-off) approximately 3 ft. below Site grade. Screen depth intervals presented reflect the approximate depth below Site grade.

FIGURE 1	BIOX® OVER-SPRAY AREA AND SELECT MONITORING WELLS	LAUSD Central Region Elementary School #13	PARSONS Pasadena, CA	Job No. (449875)			
				Designed	1	07/30/2008	
				Drawn	1	09/16/2009	GLP
				Revised	1	2/11/2010	RS
				Checked	1	2/11/2010	SO
				Reviewed	1	2/11/2010	MB
				Approved	1	2/11/2010	TW