RO -028

Rec'd via e-mail 12/27/01

SOIL AND GROUNDWATER INVESTIGATION WORK PLAN
4701 Martin Luther King, Jr. Way
Oakland, California

August, 2001

Prepared for

Children's Hospital of Oakland
747 52nd Street
Oakland, CA 94609

Prepared by

World Environmental Services & Technology
828 Mission Avenue, 2nd Floor
San Rafael, CA 94901
415/460-6770 Fax 415/460-6771
main@w-e-s-t.com

TABLE OF CONTENTS

SECTION **PAGE**

LIST OF TABLES

LIST OF FIGURES

SIGNATURE PAGE

All engineering information, conclusions, and recommendations contained in this report have been prepared by a California Professional Engineer. All hydrogeologic and geologic information, conclusions, and recommendations contained in this report have been prepared by a California Registered Geologist.

Peter M. Krasnoff
California Registered Civil Engineer (44031)

Date

Peter E. Morris
California Registered Geologist (7084)

Date

1.0 INTRODUCTION

This *Soil and Groundwater Investigation Work Plan* ("Work Plan") has been prepared by World Environmental Services and Technology, Inc. (WEST) on behalf of Children's Hospital ("Client") for the property located at 4701 Martin Luther King, Jr. Way in Oakland, California ("the Site"; Figure 1-1). Samples collected during the removal of the three underground storage tanks (USTs) in 1990, and during previous investigations conducted at the Site and at an adjacent property revealed the presence of petroleum hydrocarbons in soil and groundwater.

Based on the soil and groundwater results, the Alameda County Environmental Health Services (ACEHS) requested in a letter dated July 27, 2001 the installation of groundwater monitoring wells at the Site to "confirm if the contamination has indeed impacted the Site across 47th Street."

1.1 BACKGROUND

The Site consists of a gated and fenced parking lot for Children's Hospital. Children's Hospital was developed in the 1990's located adjacent to 47th Street and Martin Luther King Way in Oakland, California (Figure 1-1). From the 1930s until conversion to a parking lot, a two-story commercial building was present on the Site. In October 1990, three USTs containing petroleum hydrocarbons were removed from the beneath the sidewalk adjacent to the Site. Soil samples collected from the UST excavations revealed concentrations of petroleum hydrocarbons (Figure 1-2).

Environmental investigations of the three former USTs at 4629 Martin Luther King Jr. Way (4629 MLK) have revealed the presence of petroleum hydrocarbons in soil and groundwater. Based on the presence of the petroleum hydrocarbons in soil and groundwater both on and off-site, the ACEHS requested the installation of three monitoring wells along 47th Street in Oakland,

California. This Work Plan presents the scope of work to be performed install the requested monitoring wells and collect soil and groundwater samples.

2.0 SCOPE OF WORK

Based on the results of previous investigations and the request from Alameda County Environmental Health Services, WEST has developed a scope-of-work to characterize groundwater in the vicinity of the Site with the installation of three monitoring wells. The tasks to be performed to achieve the goals of the project include:

Task 1: Permitting, Health and Safety, and Utility Survey

Task 2: Soil Sampling

Task 3: Groundwater Monitoring Well Installation

Task 4: Well Development

Task 5: Well Elevation Survey

Task 6: Groundwater Sampling

Task 7: Sample Analysis

Task 8: Reporting

A detailed description of each task follows.

2.1 TASK 1: PERMITTING, HEALTH AND SAFETY, AND UTILITY SURVEY

Prior to drilling, a subsurface drilling permit will be obtained from the appropriate local agency(s). Pursuant to California Assembly Bill AB 73, Underground Services Alert (USA) will be contacted to locate utilities entering the Site, and a private underground utility locating contractor will be used to identify utilities on the Site in the vicinity of the areas proposed for investigation. Permits from the Alameda County Public Works Agency and the City of Oakland will obtained prior to drilling.

As required by the California Occupational Health and Safety Administration (CalOSHA) Title 8 §5192 *Hazardous Waste Operations and Emergency Response* and the U.S. Occupational Health and Safety Administration (OSHA) 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Responses*, a site Health and Safety Plan (HSP) will be prepared for use while conducting proposed field sampling activities.

2.2 TASK 2: SOIL SAMPLING

Three borings will be advanced at the Site for collection of soil and groundwater samples at the locations shown on Figure 2-1. It is anticipated that 12 soil samples will be collected from the three soil borings. The soil samples will be collected at approximately five-foot intervals commencing at approximately 10 feet below ground surface. Based on previous investigations it is anticipated that the borings will be terminated at approximately 25 feet below ground surface (Table 2-1).

The soil samples will be analyzed for one or more of the following: total extractable petroleum hydrocarbons (TEPH) by EPA Method 8015; total petroleum hydrocarbons as gasoline by EPA Method 8015, and petroleum related volatile organic compounds, benzene, toluene, ethyl benzene, total xylenes and MTBE by EPA Method 8021 with confirmation of MTBE by 8260B. Table 2-1 summarizes the proposed samples and associated analyses.

Soil samples for volatile chemical analyses will be collected in accordance with USEPA Method 5035 using EnCore™ sample containers. Three disposable 5-milligram (5-mg) sample plugs will be collected from each soil sample tube. The 5-mg sample plugs will be pushed into the ends of the sample tube. After collection, the sample plugs will be capped and placed in separate sealing foil pouches for transport to the analytical laboratory. Down-hole re-usable sampling equipment will be decontaminated prior to reuse at each sampling location.

The borings will be advanced utilizing a hollow stem auger drill rig. Soil samples will be collected in 6-inch long 2-inch diameter brass liners placed within a 2-inch diameter 1.5-long California Modified split spoon sample barrel. The split-spoon sample will be driven using a 140-pound hammer falling 30 inches.

2.3 TASK 3: GROUNDWATER MONITORING WELL INSTALLATION

Following collection of soil samples, the soil borings will be converted to groundwater monitoring wells (Figure 2-1). The base of the groundwater monitoring wells will be constructed of 10-foot long 2-inch diameter Schedule 40 polyvinyl chloride (PVC) slotted screen with 0.010-inch factory machined slots. The slotted screen portion will placed within the bore hole across the groundwater table encountered during the soil sampling activities to allow for seasonal fluctuation of the water table. Blank 2-inch diameter Schedule 40 PVC to the ground surface. A sand filter pack consisting of #2/16 graded sand will be placed within the annulus of the slotted screen portion of the groundwater monitoring well to height of approximately 2 feet above the screen. A 2-foot seal consisting of bentonite pellets will be placed above the sand filter pack. A Portland cement grout sanitary seal will be placed above the bentonite seal to the ground surface. A flush mounted traffic rated steel protective box will be placed over the top of the well casing. The well casing will be equipped with locking well cap for security.

Onsite wells to 30' screened from 15-30' bgs

2.4 TASK 4: WELL DEVELOPMENT

Following monitoring well installation, the wells will be developed to remove suspended materials generated during the well installation activities. Well development will consist of inserting a surge block equipped with a wiper within the PVC casing and surging the water within the well casing to flush suspended material through the sand filter pack. Following surging activities, the water within the well casing will be purged using a submersible pump or bailer. Groundwater quality parameters including temperature, pH, conductivity, and turbidity will be monitored during the well purging activities. A minimum of 10 well casing volumes will

be removed until water quality parameters have stabilized. Well development water will be placed within 55-gallon steel drums, labeled and placed at the Site. Disposal of well development water can be arranged following receipt of groundwater sampling analytical results.

Waste soil and water generated during sampling will be securely stored on-site in labeled 55-gallon drums. WEST will assist the Client in properly disposing of waste soil and water.

2.5 TASK 5: WELL ELEVATION SURVEY

Following groundwater monitoring well installation and development, the elevation of the top of the well casings will be surveyed by a California State licensed land surveyor to the nearest 0.01-foot above mean sea level (MSL). The well elevation survey will used to establish the groundwater elevation at each well location for determination of groundwater flow direction and gradient.

2.6 TASK 6: GROUNDWATER SAMPLING

Groundwater samples will be collected from the groundwater monitoring wells using a low-flow purge and sample technique. Depth to groundwater measurements will be measured to identify groundwater flow directions and gradient at the Site. The groundwater samples will be collected for analysis using EPA Method 8015/8021 for TPHg, BTEX and MTBE, and by EPA Method 8015 Modified for total extractable petroleum hydrocarbons (TEPH) for TPH as diesel and motor oil.

The samples for laboratory analysis will be collected in appropriate sample containers, labeled and then placed in an insulated chilled cooler for transport to the laboratory. The samples will be transported using USEPA chain-of-custody protocols.

The groundwater samples will be collected by lowering a stainless steel weight attached to ¼-inch diameter polyethylene disposable tubing attached to a peristaltic pump outfitted with an

electronic flow controller. Groundwater parameters including pH, dissolved oxygen, temperature, electrical conductivity, and turbidity will be measured every 3 minutes for a minimum of 15 minutes to monitor groundwater stability. Once groundwater parameters have stabilized to within 10 percent of subsequent measurements, the groundwater sample will be collected. Water collected will be transferred to a laboratory supplied sample container. Groundwater samples for TPHg, BTEX, and MTBE chemical analyses will be collected using zero headspace 40-milliliter glass volatile organic analysis (VOA) vials preserved with hydrochloric acid.

2.7 TASK 7: SAMPLE ANALYSIS

All samples will be forwarded to a California State-certified laboratory for analysis using standard USEPA chain-of-custody procedures. Quality control samples will be collected during field activities to assess the quality of data from sampling. Travel blanks, duplicate samples, and equipment blanks, as appropriate, will be submitted with samples to the analytical laboratory under the same documentation and custody procedures as the accompanying original samples.

2.7.1 Laboratory Analytical Methodology

The soil and groundwater samples will be analyzed for petroleum hydrocarbons (TPH) and associated volatile organic compounds (VOCs) using a combination of United States Environmental Protection Agency (USEPA) procedures. The primary analytical laboratory for soil and groundwater samples will be Chromalab of Pleasanton, California.

The USEPA analytical methods that may be used in evaluating chemicals in soil and groundwater at the Site include:

- EPA Method Modified 8015M with silica gel wash - total extractable petroleum hydrocarbons (TEPH) and total recoverable petroleum hydrocarbons (TRPH). and total purgeable petroleum hydrocarbons (TPPH)

- EPA Method 8021 – benzene, ethyl benzene, toluene and xylenes as well as MTBE with confirmation by EPA Method 8260B .

Any modifications to the sampling and analytical program will be reviewed with the appropriate parties prior to implementation.

2.7.2 Field Equipment Calibration

Field equipment, including PIDs, will be calibrated daily prior to each use, and calibration will be logged in the daily field report form. Instruments will be calibrated according to the procedures outlined in the handbook for each instrument.

2.7.3 Laboratory Calibration Procedures

Laboratory instrument calibration is carried out to ensure that the analytical system is performing at the required sensitivity with acceptable linearity. Frequency of calibration is determined by manufacturer's guidelines, analytical method, or client-specified requirements. Calibration records are prepared and maintained for each piece of analytical equipment and made available for inspection upon request. Copies of the laboratory quality control evaluations will be included with the final project report.

2.7.4 Equipment Blanks

Equipment blanks will be collected and may be analyzed to detect potential cross-contamination of sampling equipment used at more than one sampling location. However, if single-use disposable sampling equipment is used, then equipment blanks will not be collected. An equipment blank will be collected for each type of non-disposable sampling equipment, as appropriate. If collected, distilled water will be poured into the decontaminated sampling equipment, then decanted into sample containers for analysis.

2.7.5 Travel Blanks

Travel blanks will be submitted and may be analyzed to detect potential introduction of contaminants during transportation from the field to the laboratory. Travel blanks are prepared by the laboratory, travel to the field with sample containers, and are returned to the laboratory with the primary samples for analysis. Travel blanks may consist of distilled water in a clean container or a soil with measured concentrations of the chemicals of concern.

2.7.6 Duplicate Samples

Duplicate samples will be collected and analyzed to check for sampling consistency. Duplicate samples will be collected immediately after the primary sample using the same equipment and procedure. Ten percent of the samples will be collected for duplicate analyses. The duplicate samples will be analyzed by Entech Analytical in Sunnyvale, California.

2.7.7 Data Quality Objectives

The Data Quality Objectives (DQOs) for the implementation of the investigation are to report concentrations of chemicals within the accuracy and precision stipulated by the USEPA Methods. In addition, the reporting limit for the each chemical will be below their applicable Risk Based Screening Level (RBSL) as identified in the California Regional Water Quality Control Board – San Francisco Region's *Application of Risk Based Screening and Decision Making to Sites with Impacted Soil and Groundwater* (Regional Board, 2000). A Data Quality Assessment (DQA) test will be conducted following sampling to ensure that the DQOs (i.e., decision error rate goals) are achieved and to determine whether the number of samples collected was adequate to achieve the DQOs. If sampling DQOs are not met, supplementary sampling may be recommended to achieve DQOs.

2.8 TASK 8: REPORTING

WEST will prepare a summary of previous and recent investigations at the Site. Analytical data collected from previous and recent investigations at the Site will be evaluated and summarized. The summary will include; descriptions of the methodologies used to collect and analyze the data; descriptions of the Site and geology, including appropriately scaled base maps showing all boring locations and boring logs illustrating soil observed in the field, presentation and interpretation of soil and groundwater analytical results and laboratory data certificates, including an assessment of the extent and distribution of chemicals at the Site. The report and associated investigation will be performed under the direct supervision of appropriately licensed professionals.

3.0 REFERENCES

American Society for Testing and Materials, *Standard Guide for Representative Sampling for Management of Waste and Contaminated Media.* ASTM Designation D 6044-96. January 1997.

American Society for Testing and Materials, *Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process.* ASTM E 1903-97, December 10, 1997.

California Regional Water Quality Control Board-San Francisco Bay Region, *Application of Risk Based Screening and Decision Making to Sites with Impacted Soil and Groundwater*, Interim-Final, August 2000.

U.S. Environmental Protection Agency, *Guidance For Conducting Remedial Investigations And Feasibility Studies Under CERCLA, Interim Final*, October 1988.

U.S. Environmental Protection Agency, *Soil Screening Guidance: User's Guide*, July 1996.

U.S. Environmental Protection Agency, Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition, May 1995.

4.0 DISTRIBUTION LIST

James Jackson
Director of Facilities Planning and Construction
Children's Hospital
747 52nd Street
Oakland, California 94609

eva chu
Alameda County Health Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Leah Goldberg
Hansen Bridgett Marcus Vlahos Rudy, LLP
333 Market Street, 2nd Floor
San Francisco, CA 94105

TABLE 2-1
PROPOSED SOIL AND GROUNDWATER ANALYSES
4701 Martin Luther King Jr. Way
Oakland, California

Sample Location	Media	Depth (ft)	Proposed Analyticals		
			TPHg 8015M	TEPH 8015M	BTEX/MTBE 8021
M-1	soil	10	X	X	X
		15	X	X	X
		20	X	X	X
		25	X	X	X
	gw	--	X	X	X
M-2	soil	10	X	X	X
		15	X	X	X
		20	X	X	X
		25	X	X	X
	gw	--	X	X	X
M-3	soil	10	X	X	X
		15	X	X	X
		20	X	X	X
		25	X	X	X
	gw	--	X	X	X

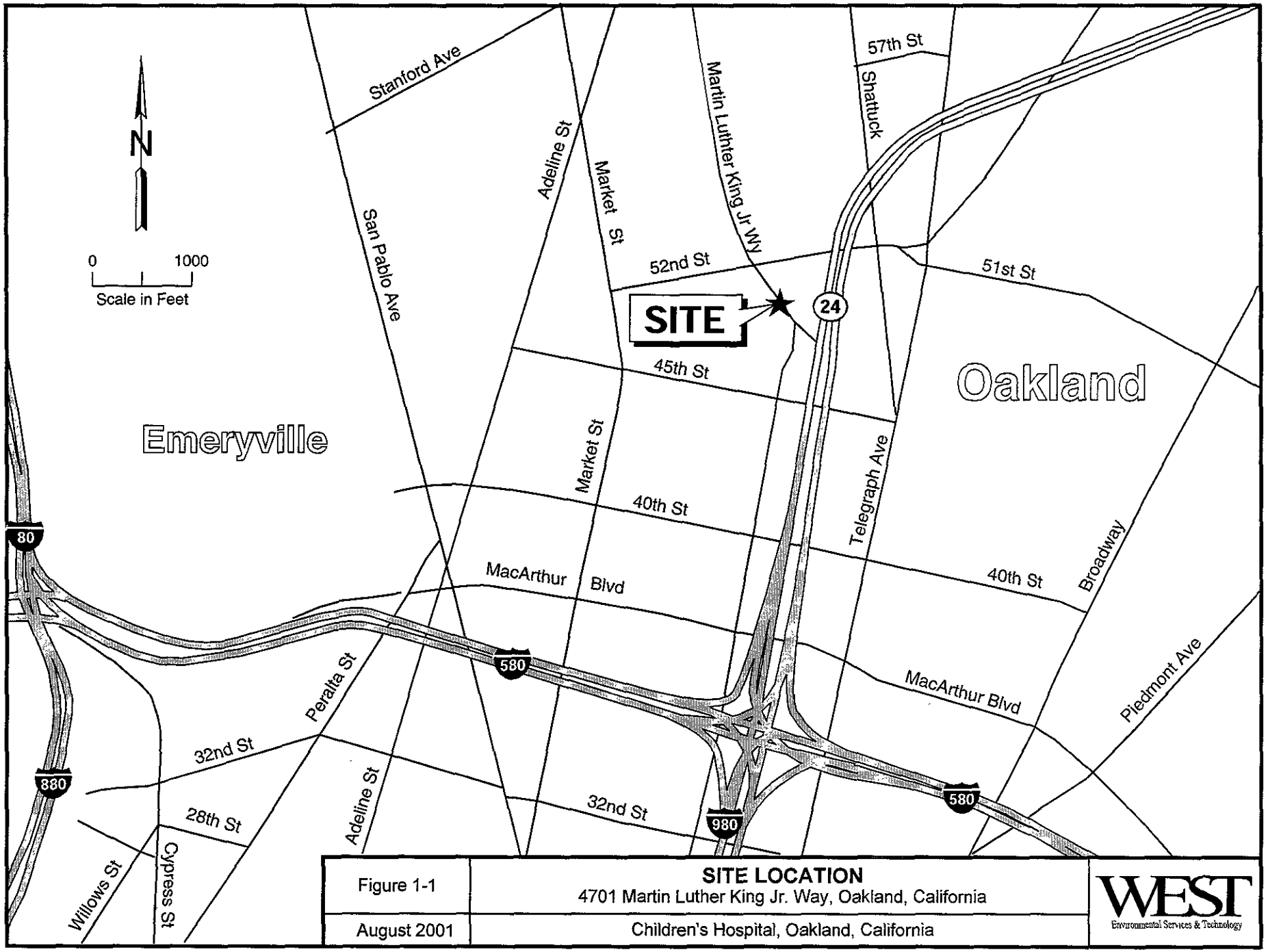

Figure 1-1	**SITE LOCATION** 4701 Martin Luther King Jr. Way, Oakland, California	WEST Environmental Services & Technology
August 2001	Children's Hospital, Oakland, California	

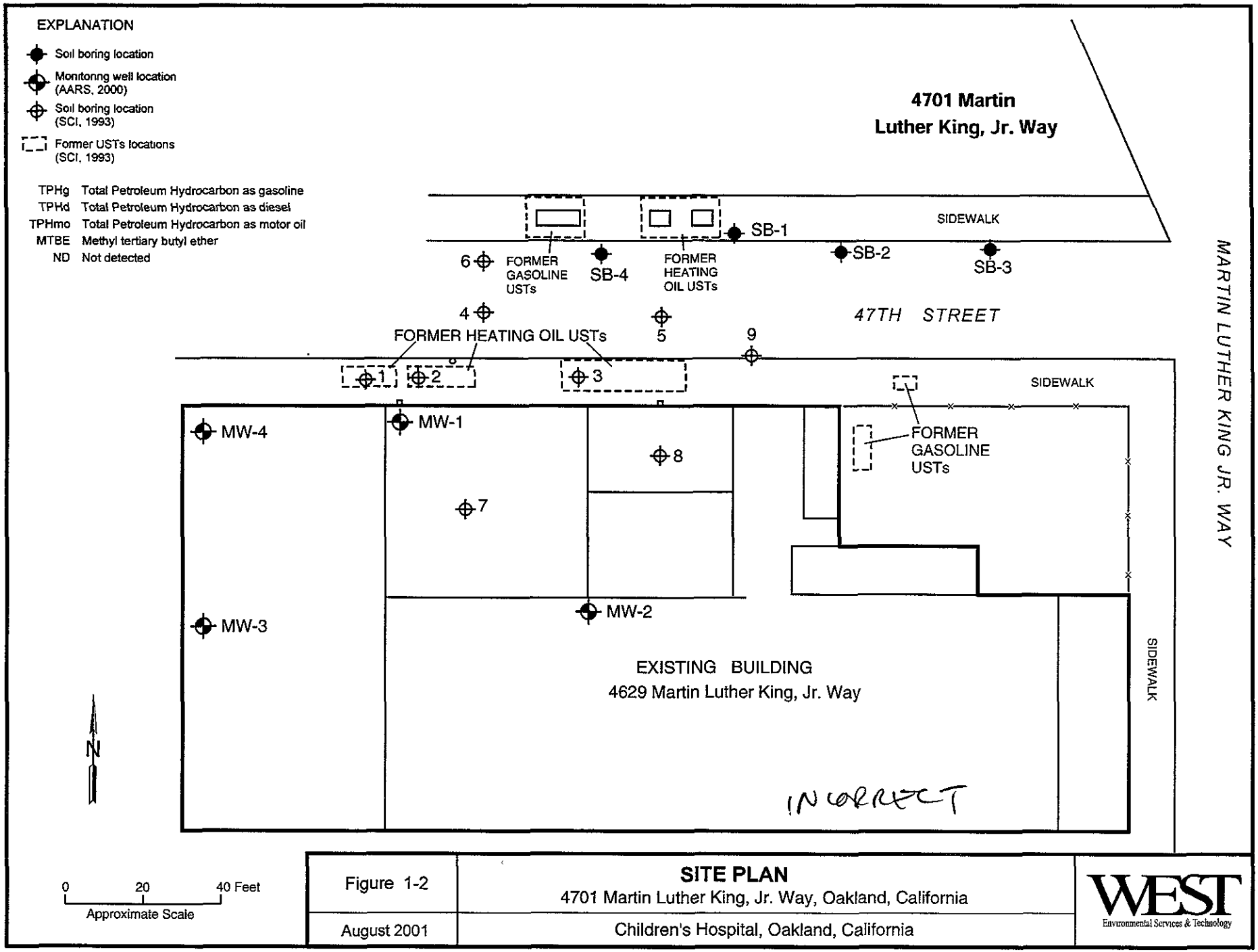

Figure 1-2	**SITE PLAN** 4701 Martin Luther King, Jr. Way, Oakland, California	WEST Environmental Services & Technology
August 2001	Children's Hospital, Oakland, California	

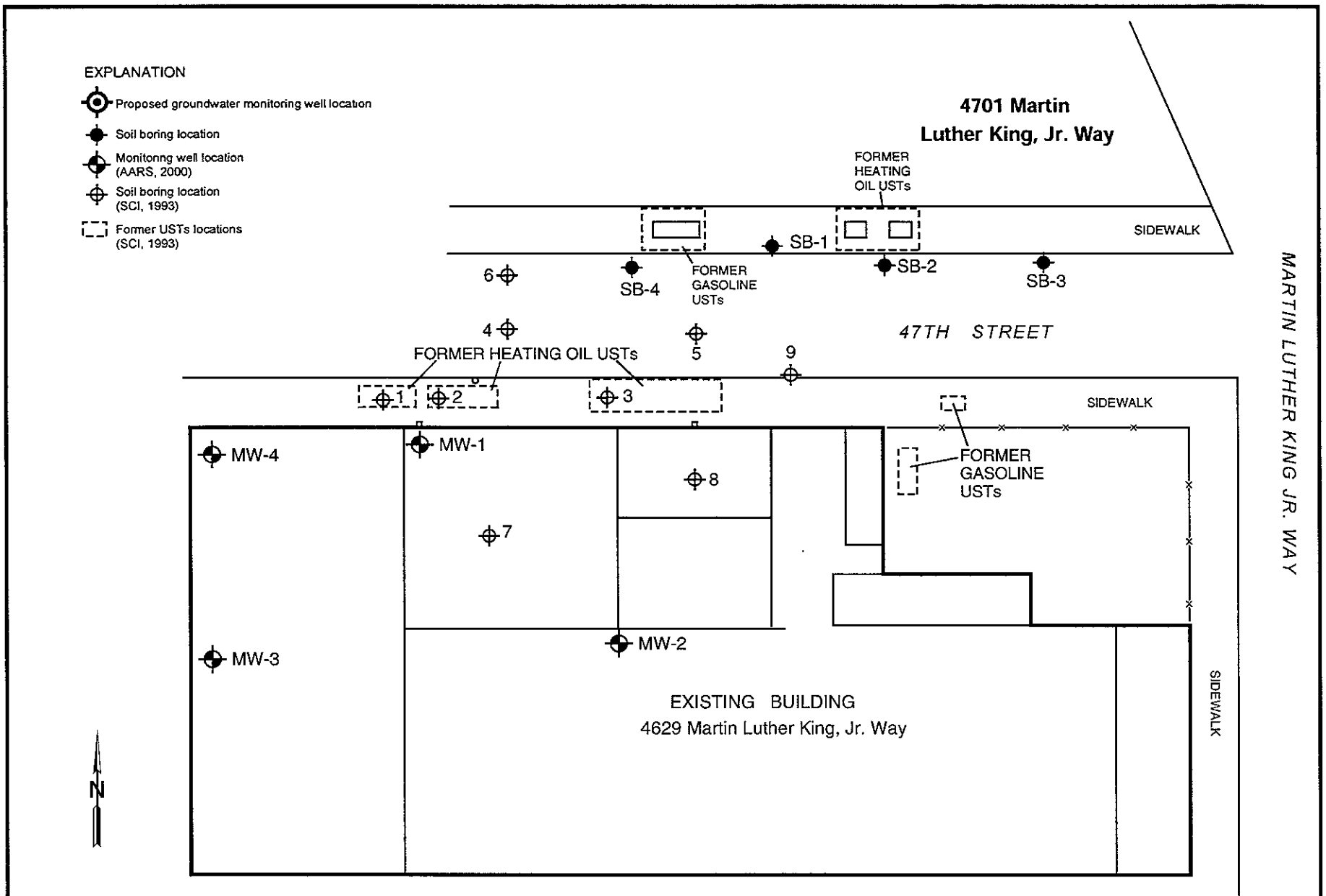

Figure 1-2	**SITE PLAN** 4701 Martin Luther King, Jr. Way, Oakland, California	WEST Environmental Services & Technology
August 2001	Children's Hospital, Oakland, California	

CORRECT SITEPLAN

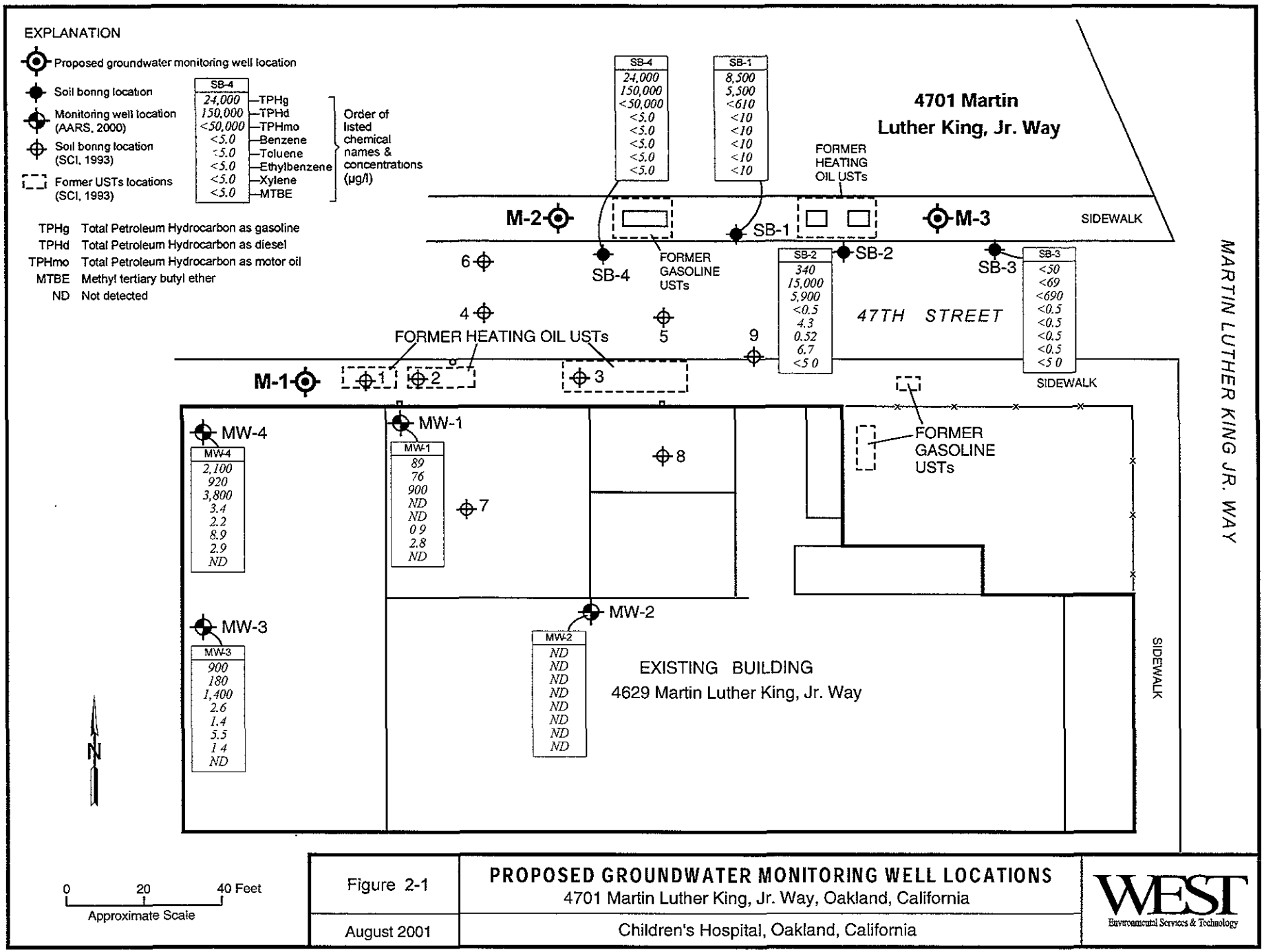

Figure 2-1

PROPOSED GROUNDWATER MONITORING WELL LOCATIONS
4701 Martin Luther King, Jr. Way, Oakland, California

August 2001

Children's Hospital, Oakland, California

WEST Environmental Services & Technology

Proposed MW-locations changed - See site plan dated Feb 2002

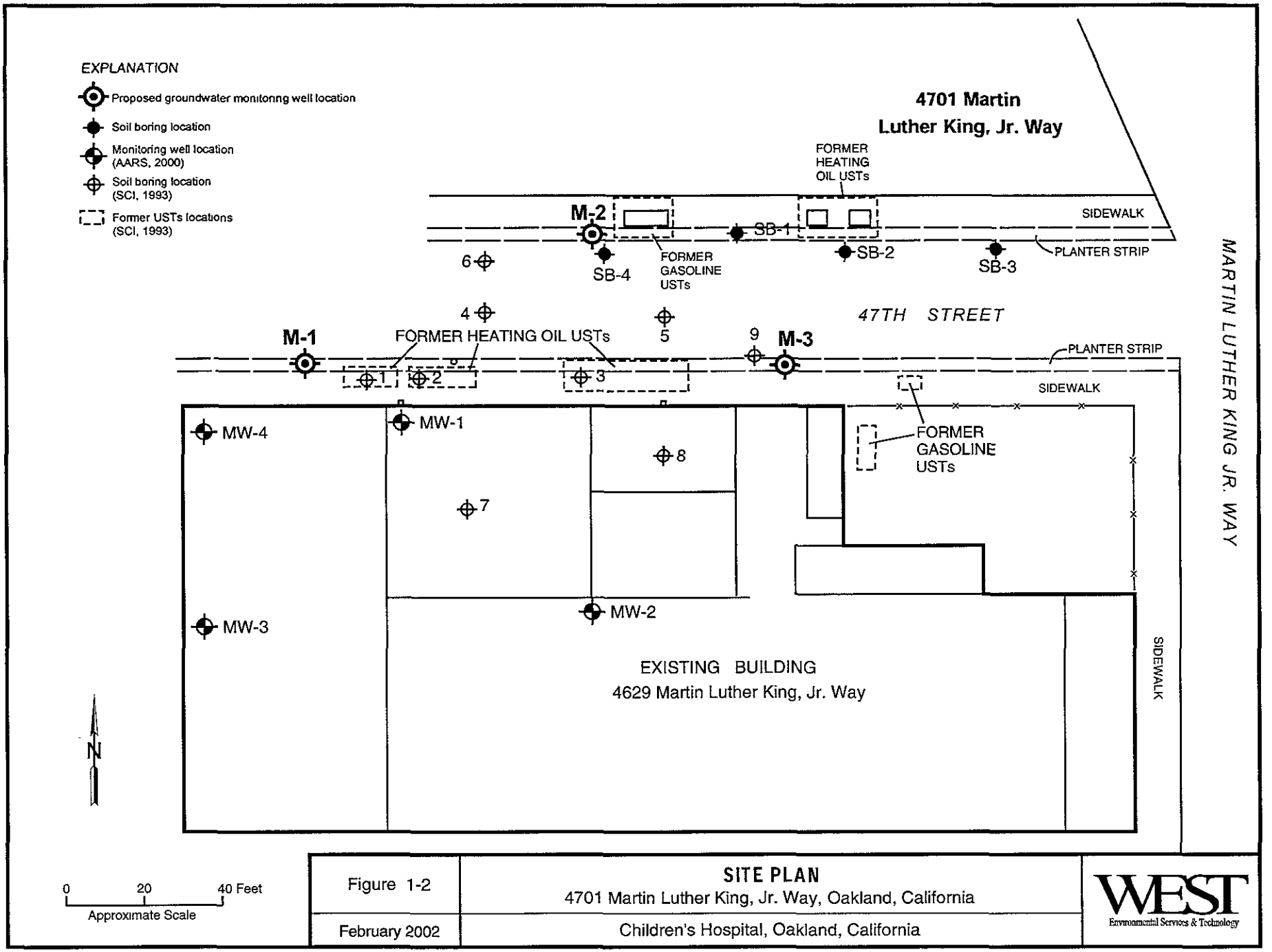

Figure 1-2	**SITE PLAN** 4701 Martin Luther King, Jr. Way, Oakland, California	WEST Environmental Services & Technology
February 2002	Children's Hospital, Oakland, California	