aqua science engineers inc.

Approved wp

June 23, 1999

# WORKPLAN
for a
# SOIL AND GROUNDWATER ASSESSMENT
at
Former Peerless Stages
2021 Brush Street
Oakland, California

Submitted by.
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## 1.0 INTRODUCTION

This submittal outlines Aqua Science Engineers, Inc. (ASE's) revised workplan for a soil and groundwater assessment at the former Peerless Stages Property located at 2021 Brush Street in Oakland, California (Figure 1). The proposed site assessment activities have been designed to delineate the extent of soil and groundwater contamination downgradient of the former underground storage tanks (USTs) and dispensers at the site (Figure 2). This workplan is intended to satisfy the requirements presented in the Alameda County Health Care Services Agency (ACHCSA) letters dated January 26 and June 14, 1999 addressed to Mr. Alex Gaeta, the responsible party. The scope of work in this workplan has been revised from ASE's workplan dated May 17, 1999 to meet the requirement of the June 14, 1999 letter from the ACHCSA.

## 2.0 BACKGROUND INFORMATION

For decades, the site has been used as a maintenance yard and fueling site for the Peerless Stages bus company. In October 1997, Cambria Environmental Technology, Inc. of Oakland, California drilled five (5) soil borings at the site. These borings were drilled in the vicinity of the existing 2,000 gallon gasoline UST, 8,000 gallon diesel-fuel UST and dispensers for the collection of soil and groundwater samples (Figure 2). Elevated concentrations of total petroleum hydrocarbons as gasoline (TPH-G) and diesel (TPH-D) were detected in the grab groundwater samples collected from two borings. Up to 120 parts per billion (ppb) TPH-G and 58,000 ppb TPH-D were detected in the groundwater samples. See Cambria's Subsurface Assessment Report dated October 20, 1997 for complete details regarding these activities.

In May 1998, ASE removed the 2,000 gallon gasoline UST from the site (Figure 2). Soil samples were collected from the bottom of the excavation and from the stockpiled soil generated during excavation activities. The soil samples were analyzed for TPH-G, TPH-D, benzene, toluene, ethylbenzene, total xylenes (collectively known as BTEX), methyl tertiary butyl ether (MTBE) and total lead. The only constituent identified in soil samples collected from the excavation was MTBE at concentrations up to 4.0 parts per million (ppm). The stockpiled soil contained 1.6 ppm TPH-G, 170 ppm TPH-D, trace concentrations of BTEX and MTBE, and 180 ppm total lead. The excavation was backfilled with import material on May 13, 1998. See ASE's UST Removal Report dated June 8, 1998 for complete details regarding these activities.

In December 1998, ASE returned to the site to remove the 8,000 gallon diesel-fuel UST and the two dispensers (Figure 2). Soil samples were collected from the bottom of the excavation, from beneath the dispensers, and from the stockpiled soil generated during excavation activities. The soil samples were analyzed for TPH-G, TPH-D, BTEX, MTBE and total lead. The constituents detected in the soil samples collected from the excavation were 0.064 ppm MTBE and 30 ppm TPH-D in soil samples collected from the eastern end of the excavation, and 5.1 ppm TPH-D in soil samples collected from the western end of the excavation. The soil samples collected beneath the dispensers contained up to 3,800 ppm TPH-D and trace concentrations of BTEX and MTBE. No TPH-G was detected in these samples. Soil samples collected from the stockpiled soil contained 2,900 ppm TPH-D, 510 ppm TPH-G, trace concentrations of BTEX and MTBE, 130 ppm total lead, and 4.9 ppm soluble lead by the waste extraction test (WET). The excavation was backfilled with clean import material. See ASE's UST Removal Report dated January 8, 1999 for complete details regarding these activities. The stockpiled soil generated during the UST removal activities was transported to the Forward, Inc. Landfill in Manteca, California on May 25, 1999 for disposal. Also on May 25, 1999, the dispenser area was overexcavated to a depth of 11-feet bgs in an effort to define and remove the vertical depth of TPH-D contamination beneath the dispensers previously identified in December 1998. Approximately 10 yards of soil were removed and were transported along with the original stockpile to the Forward, Inc. landfill in Manteca, California. Two soil samples, DIS.OEX.N.11' and DIS.OEX.S.11' were collected from the northern and southern end of the excavation, respectively, after overexcavation activities were completed. Analytical results indicated a high of 17 ppm TPH-G, 250 TPH-D, and 4.6 ppm total lead.

## 3.0 PROPOSED SCOPE OF WORK (SOW)

Based on the requirements of the ACHCSA, in their letter dated June 14, 1999, ASE's proposed SOW is as follows:

1) Prepare a workplan and a health and safety plan for approval by the ACHCSA.

2) Obtain a drilling permit from the Alameda County Public Works Agency (ACPWA).

3) Drill three (3) soil borings to approximately 30-feet bgs at the site.

4) Analyze one soil sample collected from each soil boring at a CAL-EPA certified environmental laboratory for TPH-G by modified EPA Method 5030/8015M, TPH-D by modified EPA Method 3510/8015M, BTEX and MTBE by EPA Method 8020, and total lead by EPA Method 7420. Analyze the soil sample with the highest TPH-D concentration for polynuclear aromatic hydrocarbons (PNAs) by EPA Method 8310.

5) Install 2-inch diameter groundwater monitoring wells in each boring described in task 3.

6) Develop the monitoring wells.

7) Collect groundwater samples from each monitoring well for analyses.

8) Analyze the groundwater samples at a CAL-EPA certified analytical laboratory for TPH-G, TPH-D, BTEX and MTBE. In addition, the groundwater sample with the highest TPH-D concentration will also be analyzed for PNAs by EPA Method 8310.

9) Survey the top of casing elevation of each well, and determine the groundwater flow direction and gradient beneath the site.

10) Prepare a report detailing the methods and findings of this assessment.

Details of the assessment are presented below.

*TASK 1 - PREPARE A WORKPLAN AND HEALTH AND SAFETY PLAN*

Based on the site history and the analytical results of the soil and groundwater samples collected during the previous assessment at the site, ASE has prepared this workplan as well as a site-specific health and safety plan. A nearby hospital is designated in the site safety plan as the emergency medical facility of first choice. A copy of the site specific Health and Safety Plan will be present at the site at all times.

*TASK 2 - OBTAIN NECESSARY PERMITS*

ASE will obtain a drilling permit from the Alameda County Public Works Agency (ACPWA). ASE will also notify Underground Service Alert (USA) to have underground utility lines marked in the site vicinity.

*TASK 3 - DRILL THREE SOIL BORINGS AT THE SITE*

ASE will drill three soil borings at the locations shown on Figure 3. The borings will be drilled using a hollow-stem auger drill rig. The drilling will be directed by a qualified ASE geologist. Undisturbed soil samples will be collected at least every 5-feet, at lithographic changes, and from just above the water table for subsurface hydrogeologic description and possible chemical analysis. The samples will be described by the ASE geologist according to the Unified Soil Classification System. The samples will be collected in brass tubes using a split-barrel drive sampler advanced ahead of the auger tip by successive blows from a 140-lb. hammer dropped 30-inches. Each sample will be immediately removed from the sampler, trimmed, sealed with Teflon tape and plastic caps, secured with duct tape, labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory.

Soil from the remaining tubes not sealed for analysis will be removed for hydrogeologic description and will be screened for volatile compounds with an organic vapor meter (OVM). The soil will be screened by emptying soil from one of the tubes into a plastic bag. The bag will be sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the OVM will measure the vapor through a small hole punched in the bag. These OVM readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

All sampling equipment will be cleaned in buckets with brushes and a trisodium phosphate (TSP) or Alconox solution, then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums until off-site disposal can be arranged.

*TASK 4 - ANALYZE AT LEAST ONE SOIL SAMPLE FROM EACH BORING*

At least one soil sample from each boring will be analyzed at a CAL-EPA certified environmental laboratory for TPH-G by modified EPA Method 5030/8015M, TPH-D by modified EPA Method 3510/8015M, BTEX and MTBE by EPA Method 8020, and total lead by EPA Method 7420. The soil sample to be analyzed will be the sample which appears to be the most contaminated based on odors, staining and/or OVM readings. If there is no indication of contamination in any of the samples, the sample

collected from just above the water table (the capillary zone) will be selected for analysis. In addition, the soil sample with the highest TPH-D concentration will also be analyzed for polynuclear aromatic hydrocarbons (PNAs) by EPA Method 8310.

*TASK 5 - COMPLETE THE BORINGS AS MONITORING WELLS*

ASE will complete the borings described in task 3 as 2-inch diameter groundwater monitoring wells. The wells will be constructed with 2-inch diameter, flush-threaded, schedule 40, 0.020-inch slotted PVC well screen and blank casing. The well casing will be lowered through the augers and #3 Monterey sand will be placed in the annular space between the well casing and the borehole to approximately 1.5-feet above the screened interval. Approximately 0.5-foot of bentonite pellets will be placed on top of the sand pack and hydrated with deionized water. This bentonite layer will prevent the cement sanitary seal from infiltrating into the sand pack. Cement mixed with 3 to 5 percent bentonite powder by volume will be used to fill the annular space between the bentonite layer and the surface to prevent surface water from infiltrating into the well. The well head will be protected by a locking well plug and an at-grade, traffic-rated well box (See Figure 4 - Typical Monitoring Well).

The well will be screened to monitor the first water-bearing zone encountered. Wells are typically screened with 5-feet of screen above the water table and 10 to 15-feet of screen below the water table.

*TASK 6 - DEVELOP THE MONITORING WELLS*

The monitoring wells will be developed after waiting at least 72 hours after well construction. The wells will be developed using at least two episodes of surge block agitation and bailer or pump evacuation. At least ten well casing volumes of water will be removed during the development, and development will continue until the water appears to be reasonably clear. The well development purge water will be stored temporarily on-site in sealed and labeled 55-gallon steel drums until off-site disposal can be arranged.

*TASK 7 - SAMPLE THE MONITORING WELLS*

After waiting 72 hours after the well development, ASE will sample the monitoring wells. Prior to purging and sampling, the groundwater surface in each well will be checked for sheen or free-floating hydrocarbons. The thickness of any free-floating hydrocarbons will be measured with an

acrylic bailer which will be lowered slowly to the groundwater surface and filled approximately half full for direct observation. ASE will also measure the depth to groundwater in all site wells prior to purging water from any well. Prior to sampling, each well will be purged of at least four well casing volumes of groundwater. The temperature, pH and electrical conductivity of evacuated water will be monitored during the well purging, and purging will continue beyond four well casing volumes if these parameters have not stabilized. Groundwater samples will be collected from each well using disposable polyethylene bailers. Groundwater will be decanted from the bailers into 40-ml glass volatile organic analysis (VOA) vials, preserved with hydrochloric acid, sealed without headspace and labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples. The samples will then be placed into an ice chest with ice for transport to the analytical laboratory under chain of custody. Purged groundwater will be stored temporarily on-site in sealed and labeled 55-gallon steel drums until off-site disposal can be arranged.

*TASK 8 - ANALYZE THE GROUNDWATER SAMPLES*

The groundwater samples will be analyzed by a CAL-EPA certified analytical laboratory for TPH-G by modified EPA Method 5030/8015M, TPH-D by modified EPA Method 3510/8015M, and BTEX and MTBE by EPA Method 8020. In addition, the groundwater sample with the highest TPH-D concentration will also be analyzed for PNAs by EPA Method 8310.

*TASK 9 - SURVEY THE TOP OF CASING ELEVATION OF EACH WELL*

ASE will survey the top of casing elevation of each well relative to a site datum. These elevations will be used with the depth to groundwater measurements to determine the groundwater flow direction and gradient beneath the site.

*TASK 10 - PREPARE A SUBSURFACE ASSESSMENT REPORT*

ASE will prepare a subsurface assessment report outlining the methods and findings of this assessment. This report will include a summary of the results, the site background and history, description of the well construction, development and sampling, tabulated soil and groundwater analytical results, conclusions and recommendations. Formal boring logs, analytical reports, and chain of custody documents will be included as appendices. This report will be submitted under the seal of a California registered civil engineer or geologist

## 4.0 SCHEDULE

ASE plans to begin field activities immediately upon approval of this workplan by the ACHCSA.

Should you have any questions or comments, please call us at (925) 820-9391.

Respectfully submitted,

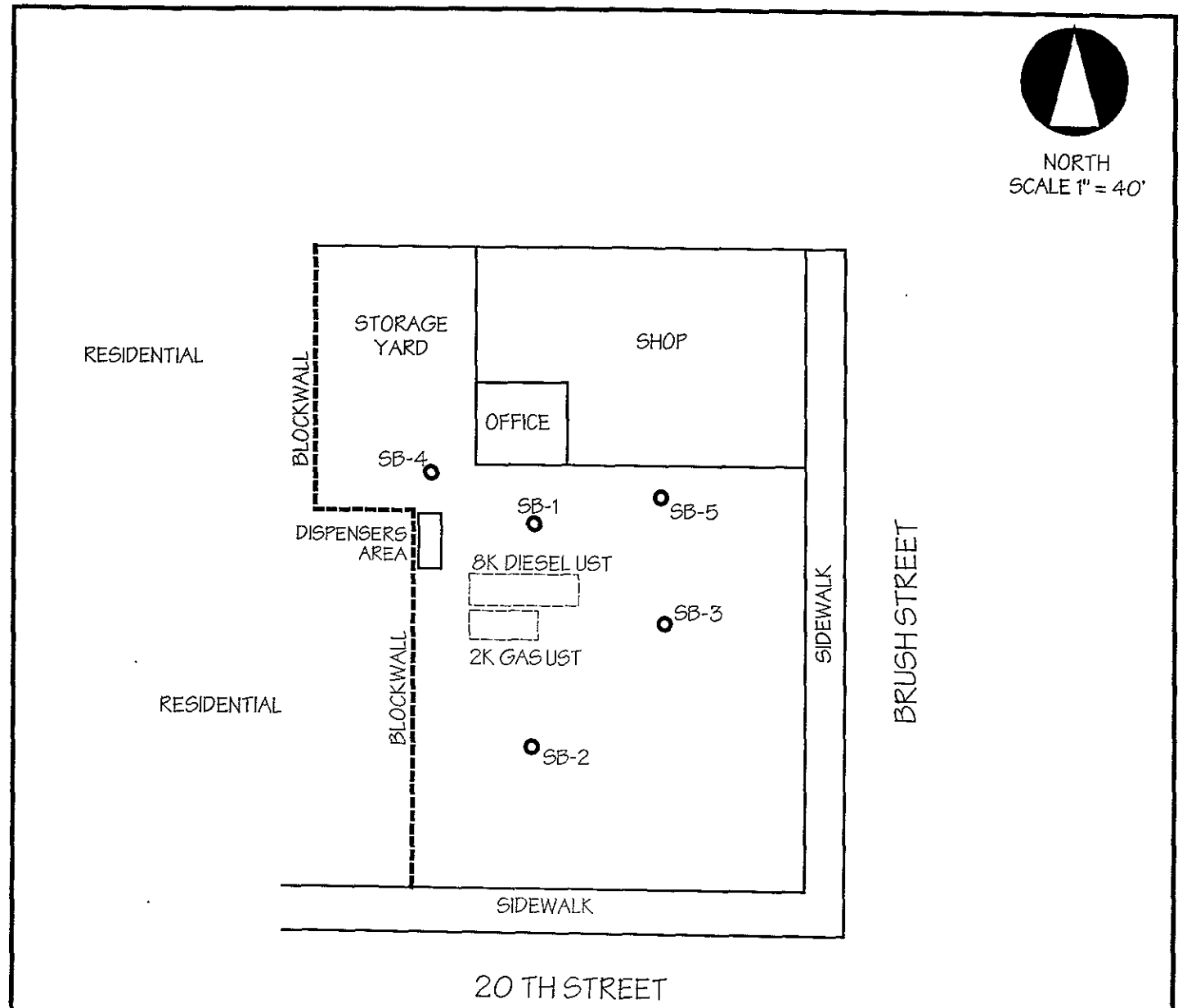
AQUA SCIENCE ENGINEERS, INC.


Robert E. Kitay, R.G., R.E.A.
Senior Geologist


# SITE LOCATION MAP

Peerless Stages, Inc.
2021 Brush Street
Oakland, California

Aqua Science Engineers | Figure 1

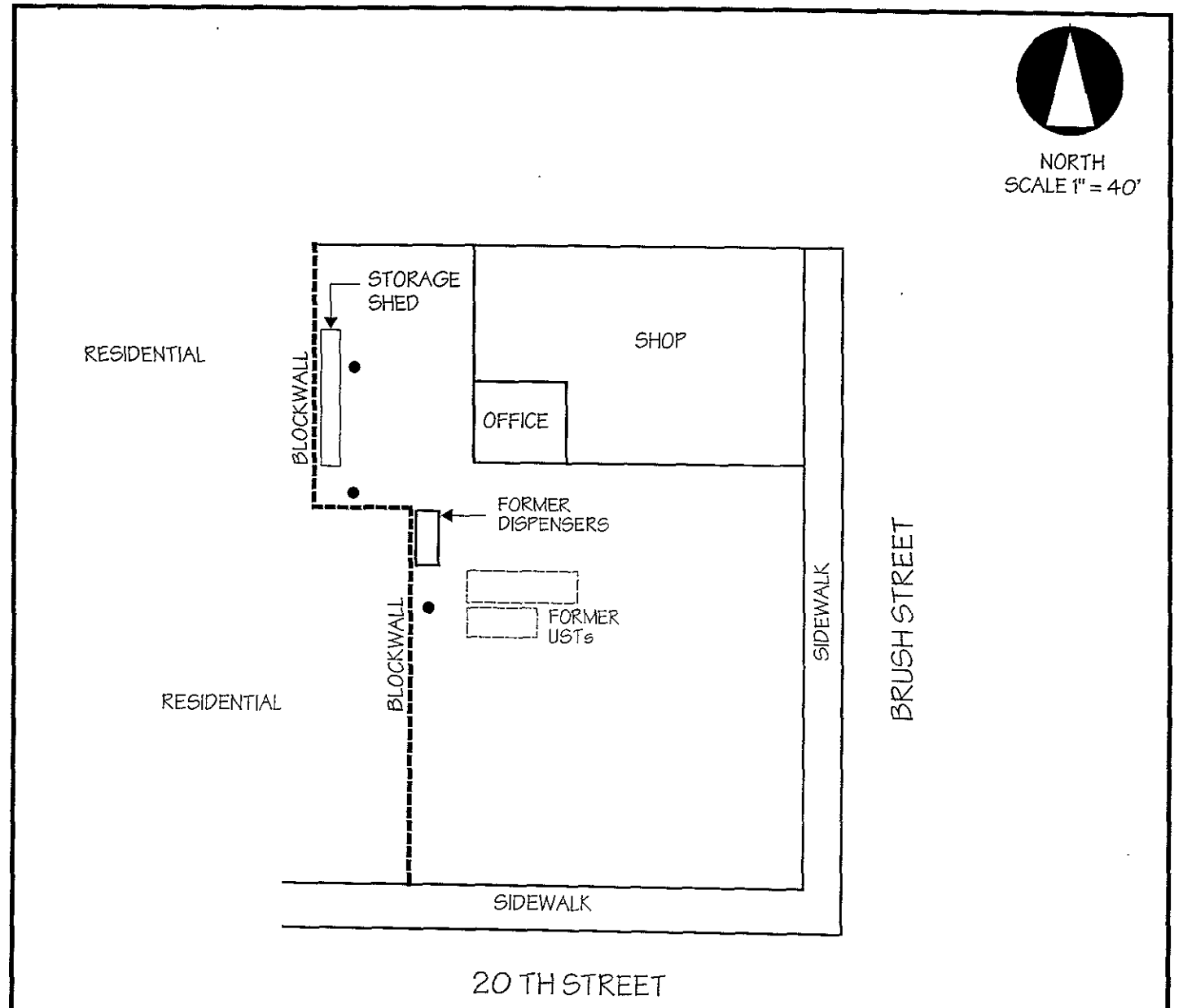



| LEGEND | |
|---|---|
| | UST LOCATION |
| SB-5 | GEOPROBE LOCATION, BY CAMBRIA 1997 |

# SITE PLAN

Former Peerless Stages, Inc. Property
2021 Brush Street
Oakland, California

AQUA SCIENCE ENGINEERS | Figure 2




LEGEND

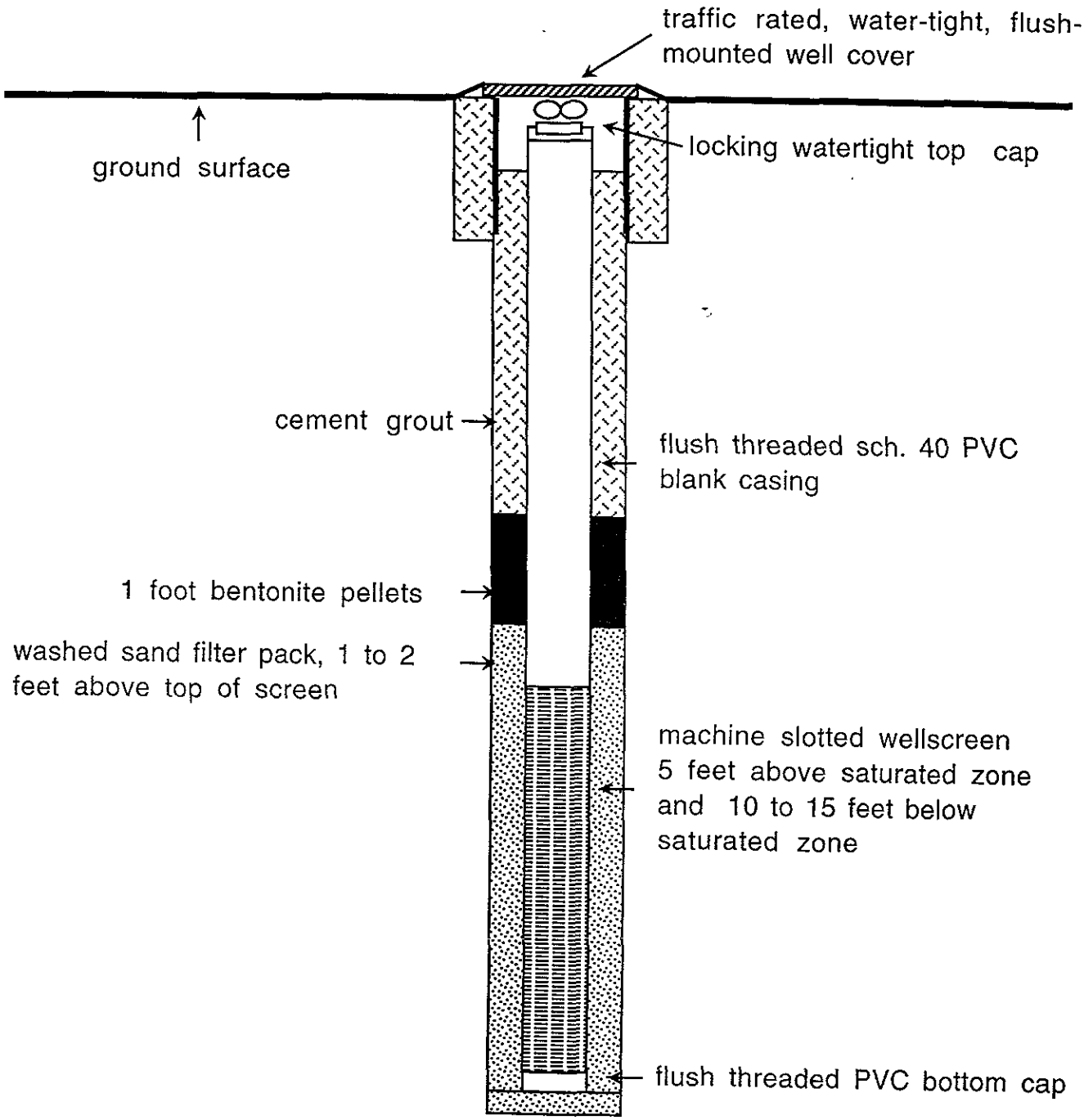
FORMER UST LOCATION

PROPOSED WELL LOCATION

PROPOSED MONITORING WELL LOCATION MAP

Former Peerless Stages, Inc. Property
2021 Brush Street
Oakland, California

AQUA SCIENCE ENGINEERS | Figure 3




TYPICAL
MONITORING WELL CONSTRUCTION
IN CROSS SECTION

Aqua Science Engineers | Figure 4