WORK PLAN #WP93002
MONITORING WELL
INSTALLATION & SAMPLING
at
11727 Main Street
Sunol, California

PREPARED BY ENVIRONMENTAL BIO-SYSTEMS, INC.
FOR
MR. JIM O'LAUGHLIN

Dave Sadoff
Project Geologist, REA

12 May 1993

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FIGURES

1. INTRODUCTION

This document describes proposed subsurface exploration to be conducted for Mr. Jim O'Laughlin (the Client) by Environmental Bio-Systems, Inc. (EBS), at 11727 Main Street in Sunol, California (the site). This work plan has been requested by the Alameda County Health Agency (ACHA).

The site is owned by the Client. The principal site contacts are:

Principal Client Contact - Mr. Jim O'Laughlin, P.O. Box 400, Sunol, CA 94586, (510) 471-1100, extension 2106.

Consultant - Environmental Bio-Systems, Inc., 30028 Industrial Parkway Southwest, Suite C, Hayward, CA 94544, (510) 429-9988. Project Manager - Dave Sadoff.

2. SCOPE OF WORK

The scope of work described in this work plan outlines the installation of two ground water monitoring wells, the collection and analysis of water and soil samples, and the generation of a project report. Work will be performed under supervision of a California Registered Geologist.

3. SITE DESCRIPTION

The site is located at 11727 Main Street in the City of Sunol, County of Alameda, California. A site location Map is presented as Figure 1. A site diagram showing the locations of proposed monitoring wells and relevant site structures is included as Figure 2.

The site lies approximately 100-feet south of Sinbad Creek, and approximately 400-feet west of Arroyo de la Laguna, on the north edge of the Sunol Valley. Previous subsurface explorations at the site have encountered unconsolidated alluvium consisting of sand, gravel, cobbles and boulders.

The site is currently vacant. A fire destroyed two site structures in 1989. A concrete pad and pump island are the only remaining structures on the site. The topography of the site is generally flat, dipping slightly to the east.

4. PROJECT HISTORY

February 1990

Four underground storage tanks (USTs) were excavated from the site on 7 February 1990 by Hageman-Schank, Inc. of Lafayette, California (Hageman-Schank). The tanks were reportedly used to contain gasoline and diesel fuels.

Routine soil sampling conducted subsequent to the UST removals revealed soil impacted with hydrocarbons within the excavations. Total petroleum hydrocarbons as diesel (TPHd) was detected in soil samples at concentrations up to 200-parts per million (ppm); total petroleum hydrocarbons as gasoline (TPHg) was detected at concentrations up to 1,100-ppm.

Hageman-Schank reportedly extended the excavations until soil samples had non-detectable levels of petroleum hydrocarbons. The excavated soil (approximately 40-cubic yards) is presently stockpiled on asphalt and a concrete pad at the site.

July 1990

On 13 July 1990 Hageman-Schank attempted to install one ground water monitoring well at the site, using an air-rotatry drilling rig. Hageman-Schank was not able to set the casing due to sloughing within the boring. Ground water was reportedly encountered at approximately 70-feet below ground surface (bgs). The boring was reportedly backfilled with Monterey sand.

October 1990

On 30 October 1990 Hageman-Schank redrilled the backfilled boring using hollow-stem augers. At this time, ground water was reportedly encountered at approximately 33-feet bgs. The well was completed to a depth of 65-feet bgs.

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November 1990

On 13 November 1990 Hageman-Schank collected a ground water sample from the well. The sample did not contain detectable levels of TPHg or benzene, toluene, ethylbenzene, and xylene isomers (BTEX). TPHd was found at a concentration of 840-parts per billion (ppb).

February 1991 through December 1992

Eight sampling events were performed by Hageman-Schank (now known as Hageman-Aguiar, Inc.) between February 1991 and December 1992. The results of sampling events reviewed by EBS are presented in Table 1:

TABLE 1. GROUND WATER ANALYTICAL RESULTS

Well	Date	TPHg	TPHd	TPHk	B	T	E	X	TOG
MW1	11/13/91	ND	840	NA	ND	ND	ND	ND	NA
MW1	2/26/91	ND	ND	NA	ND	ND	ND	ND	NA
MW1	5/16/91	ND	ND	NA	ND	ND	ND	ND	NA
MW1	8/19/91	260	220	NA	0.6	ND	0.7	3.1	NA
MW1	12/20/91	500	480	NA	ND	ND	ND	1.7	NA
MW1	2/12/92	440	ND	2,200	0.6	0.6	0.6	2.9	NA
MW1	5/13/92	ND	ND	280	ND	NE	0.6	3.6	ND
MW1	8/10/92	ND	650	520	ND	ND	ND	ND	NA
MW1	12/4/92	ND	180	120	ND	ND	ND	ND	ND
Detection Limit		50	50	50	0.5	0.5	0.5	0.5	0.5

LEGEND

TPHg: Total Petroleum Hydrocarbons as Gasoline
TPHd: Total Petroleum Hydrocarbons as Diesel
TPHk: Total Petroleum Hydrocarbons as Kerosene
BTEX: Benzene, Toluene, Ethylbenzene, Xylene Isomers
TOG: Total Oil and Grease
ND: Not Detected
NA: Not Analyzed
All results in µg/L (parts per billion), except TOG in mg/L (parts per million)

5. PERMITTING

Before commencement of work, all necessary permits from regulatory agencies will be obtained. All field work will be performed according to a site safety plan (SSP) prepared specifically for this project addressing the concerns of OSHA and Cal-OSHA. Work will begin following due notification to the ACHA, the Alameda Flood Control District 7, and the State of California Department of Water Resources.

6. SUBSURFACE EXPLORATION

EBS will drill 2 soil borings at the proposed locations shown on Figure 2. Two-inch diameter ground water monitoring wells will be constructed in both of these soil borings. These wells will be designated as MW2 and MW3. Well MW1, also shown on figure 2, is an existing 2-inch diameter well.

6.1. DRILLING OF SOIL BORINGS

The borings will be drilled with a truck mounted mobile drilling rig, equipped with 8-inch diameter continuous flight hollow stem augers. All drilling and sampling equipment will be decontaminated prior to the commencement of work, and between the drilling of each borehole to preclude cross-contamination.

6.2. SOIL SAMPLE COLLECTION

Soil samples will be collected at the following depths within each borehole:

- At 5-foot intervals below ground surface (bgs) until ground water is first encountered
- At changes in lithology
- At the measured ground water interface

To collect the samples, a California-modified split-barrel sampler will be driven into the soil by a 140-pound hammer falling 30-inches. The sampler will be driven a total of 18-inches. The number of blows required to drive the sampler every 6-inches will be counted as an indicator of the relative density of granular soil and the consistency of cohesive soil. The samples will be removed from the sampler as soon as it has been opened, and the ends of the liners containing soil designated for laboratory analysis will be wrapped with Teflon tape and sealed with plastic end caps. The sample tubes will be labeled, stored on ice, and delivered to a California state certified analytical laboratory. The samples will be maintained and transferred in keeping with chain of custody procedures. The sampler will be washed with a non-phosphate cleaner and rinsed with distilled water between the collection of samples.

Field screening will be performed using a photoionization detector (PID), a portable instrument which measures organic vapors. All samples will be characterized according to the Unified Soil Classification System (USCS), and any distinguishing features (such as color and odor) will be noted on the borehole lithologic logs.

The soil samples that will be selected for laboratory analyses will include all 5-feet bgs samples and the ground water interface sample from MW2 (the well located within 10-feet of the former diesel UST excavation), and any sample exhibiting potential petroleum hydrocarbon-containing characteristics (e.g. positive PID readings, discoloration or odor).

6.3. MONITORING WELL CONSTRUCTION

After advancing the augers to a depth of approximately 15 to 20-feet below the depth at which ground water is first encountered, 2-inch diameter PVC wells will be constructed in each of the 2 soil borings designated for monitoring well construction. The method of construction will be in accordance with the standards and guidelines of the ACHA and the Regional Water Quality Control Board (RWQCB). The screened interval of the wells will be extended to approximately 5-feet above the depth at which water is encountered within the borings. Completion of the wells will include a filter pack of #3 sand to a depth of 2-feet above the top of the screen, a 2-foot bentonite clay seal, Portland cement seal to grade, a traffic box set in concrete, and a locking well cap with a water-tight seal.

6.4. WELL DEVELOPMENT

Wells MW2 and MW3 will be developed after allowing at least 72-hours to elapse following completion of the ground water monitoring well installation. Development of the wells will be performed using a Smeal 5-ton well development rig. The wells will be purged until free of sediment or until measured parameters of pH, temperature, and conductivity have been noted to have stabilized.

6.5. WELL SAMPLING

Sampling of proposed wells MW2, and MW3, as well as existing well MW1, will be performed subsequent to allowing a period of at least 72-hours for stabilization following development of wells MW2 and MW3. During purging and sampling of the wells, observations of the presence or absence and thickness of free product, presence of sheen or emulsified product, and well recharge rates will be noted on a field log by the sampling technician. A minimum of 4-casing volumes will be purged from the wells prior to collection of samples. Periodic measurements of pH, temperature, and conductivity will be performed and recorded on the field log. When all 3 parameters are found to have stabilized, a water sample will be collected using a new disposable bailer. If free product is encountered in the well, no sample will be collected for laboratory analysis.

If a well fails to recharge sufficiently prior to the purging of at least 4-well casing volumes, a sample will be collected only after that well has recovered to 80% of the initial measured water level.

6.6. CONTAINMENT OF DRILL CUTTINGS AND WATER

All drill cuttings generated during drilling will be stored on top of the concrete pad at the site pending the receipt of analytical results. The cuttings will be covered with weighted visqueen to prevent volatile emmisions and rainwater runoff.

All water generated during the decontamination of equipment, and monitoring well purge and development water will be contained on-site in labelled 55-gallon drums pending the receipt of analytical results.

Drums used for soil and water containment will be approved for this use by the Department of Transportation.

6.7. SAMPLE ANALYSIS

Selected soil samples, as well as the ground water samples will be analyzed for the following constituents:

- TPHg and BTEX using Environmental Protection Agency (EPA) (modified) Method 8015 and Method 8020
- TPHd and TPHk using EPA (modified) Method 8015

Analysis will be performed at American Environmental Network- Quanteq Laboratories in Pleasant Hill, California (Quanteq). Quanteq is certified by the State of California for the analyses requested.

6.8. TOP OF CASING SURVEY

After installation, the ground water monitoring well's top of casings will be surveyed by a California licensed land surveyor. This data will be used to establish ground water flow direction and gradient beneath the site.

7. WORK ITINERARY

12 May 1993
Submit work plan for further subsurface exploration to ACHA.
19 May 1993
Secure permits for well installation.
25 May 1993
Commence drilling and well installation of wells MW2 and MW3 according to ACHA approved work plan.
1 June 1993
Survey of wells.
Develop wells using smeal rig.
3 June 1993
Sampling of wells MW1, MW2, and MW3.
18 June 1993
Laboratory report due.
23 June 1993
Submission of EBS report

8. DOCUMENTATION

A final report documenting the observations, results, conclusions, and recommendations of the project will be prepared and submitted to the client within 30 days of the completion of the field work. Interpretations of the site conditions and the results of analyses will also be provided. Documentation will include scaled diagrams, logs of soil types

encountered, copies of the chain of custody forms, laboratory reports, tabulated data, and interpretative figures as needed.

8.1. REPORTAGE

The information obtained during this work will remain confidential and will be released only with the authorization of our client, Mr. Jim O'Laughlin. It is the responsibility of the client to forward copies of the report to all appropriate agencies and individuals. Copies submitted to the ACHA and the RWQCB must be accompanied by a letter attesting to the validity of this report to the best of the Client's knowledge. This letter must be signed by an the client.

9. REFERENCES

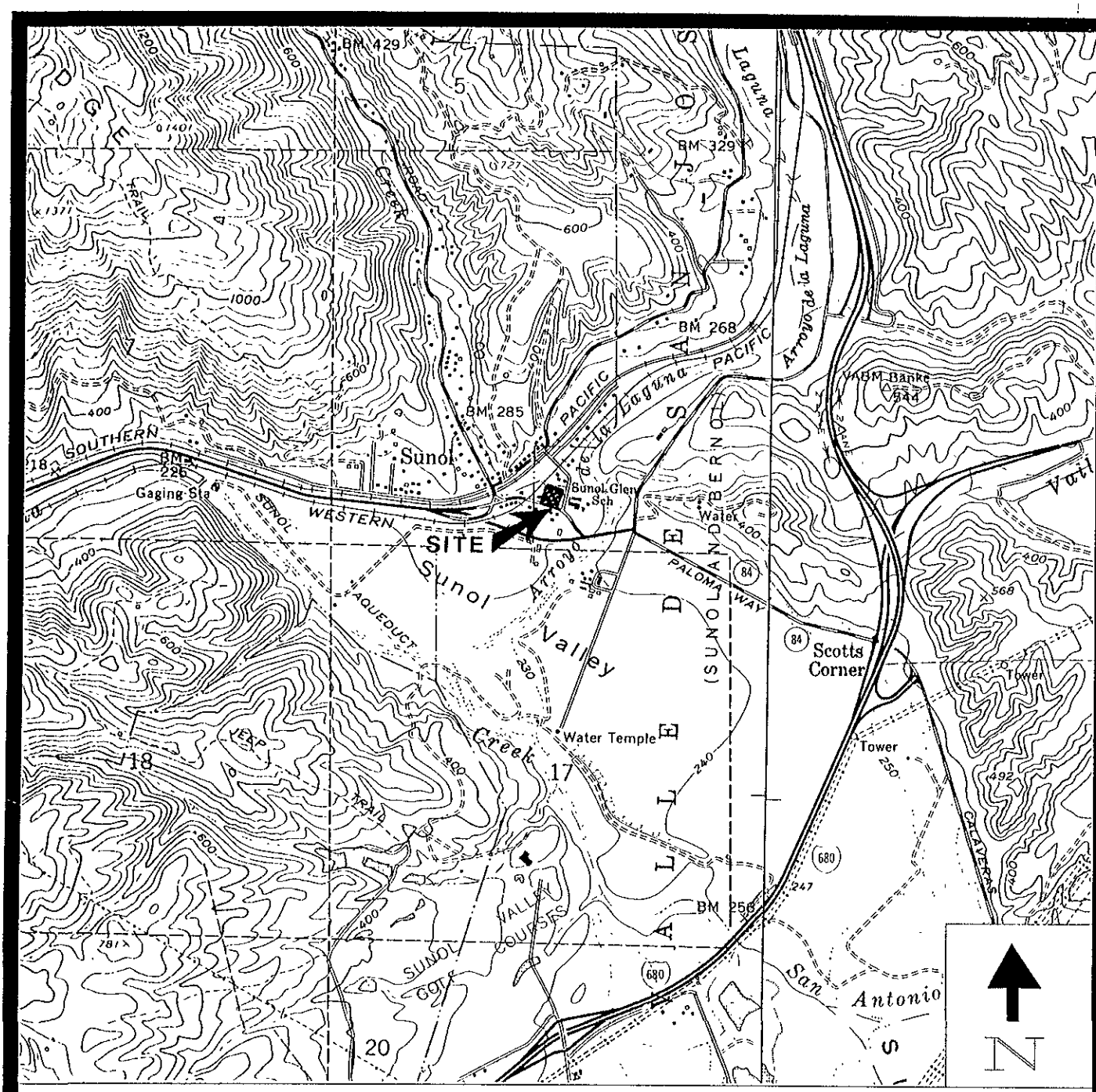
Hageman-Schank, Inc., Proposal for Subsurface Investigation, Former Chevron Station, 11727 Main Street, Sunol, California, 25 July 1990.

Hageman-Schank, Inc., Report of Groundwater Sampling, Former Chevron Station, 11727 Main Street, Sunol, California, 10 December 1990.

Hageman-Aguiar, Inc., Quarterly Groundwater Sampling Report (sampled August 10, 1992) and Proposal for Additional Subsurface Investigation, Former Chevron Station, 11727 Main Street, Sunol, California, 27 August 1992.

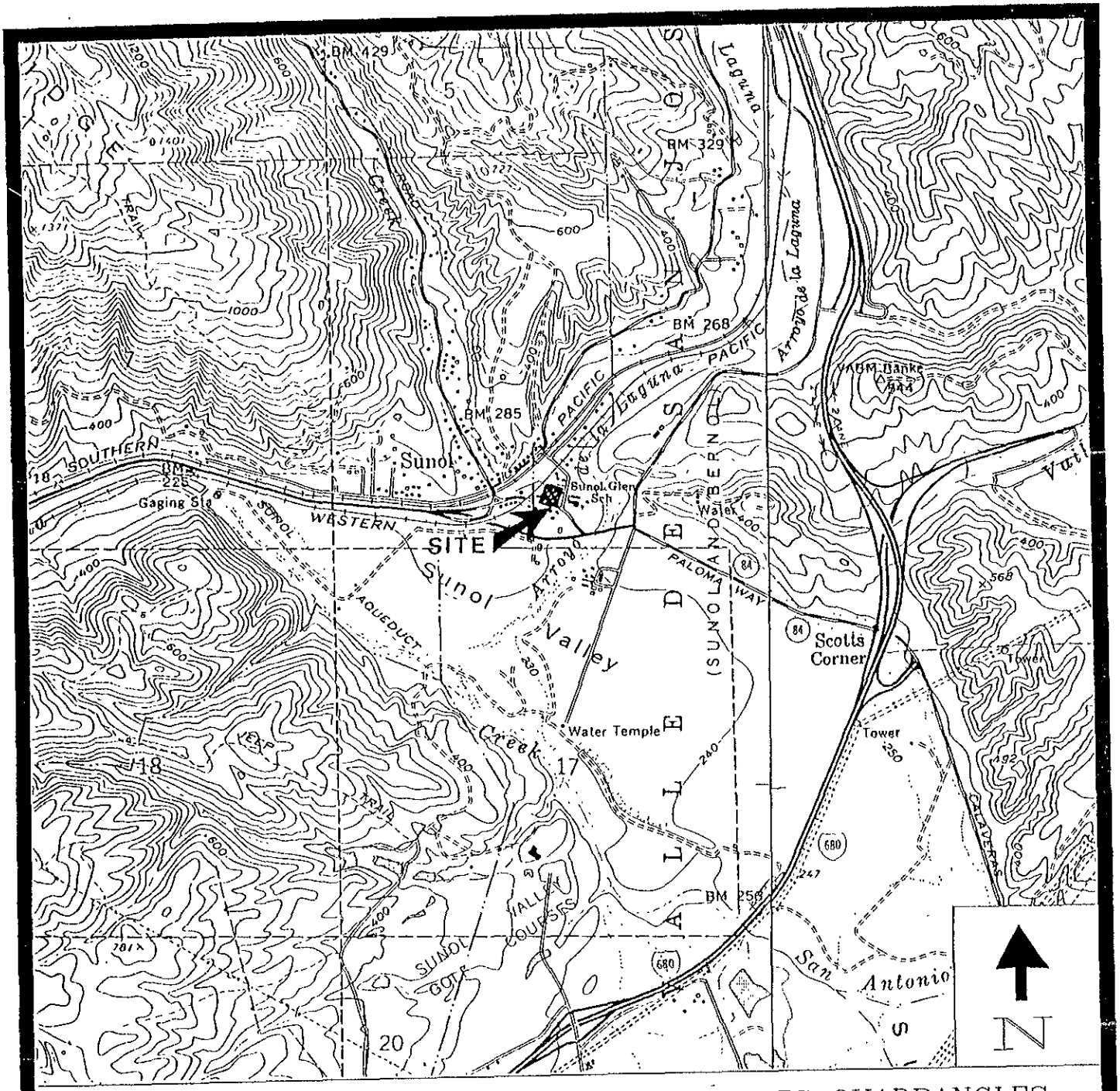
United States Geological Survey (USGS), Topographic Map, La Costa Valley Quadrangle, 7.5-minute series with 40-feet contour intervals, 1960, photorevised 1968, photoinspected 1978

USGS, Topographic Map, Niles Quadrangle, 7.5-minute series with 40-feet contour intervals, 1961, photorevised 1980.



SOURCE: USGS LA COSTA VALLEY AND NILES QUADRANGLES

ENVIRONMENTAL BIO-SYSTEMS, INC.	DATE: 5/12/93	FIGURE 1 SITE LOCATION MAP
	DRAWN BY: DAS	FORMER CHEVRON STATION 11727 MAIN STREET SUNOL, CALIFORNIA
	SCALE: 1"=2,000'	



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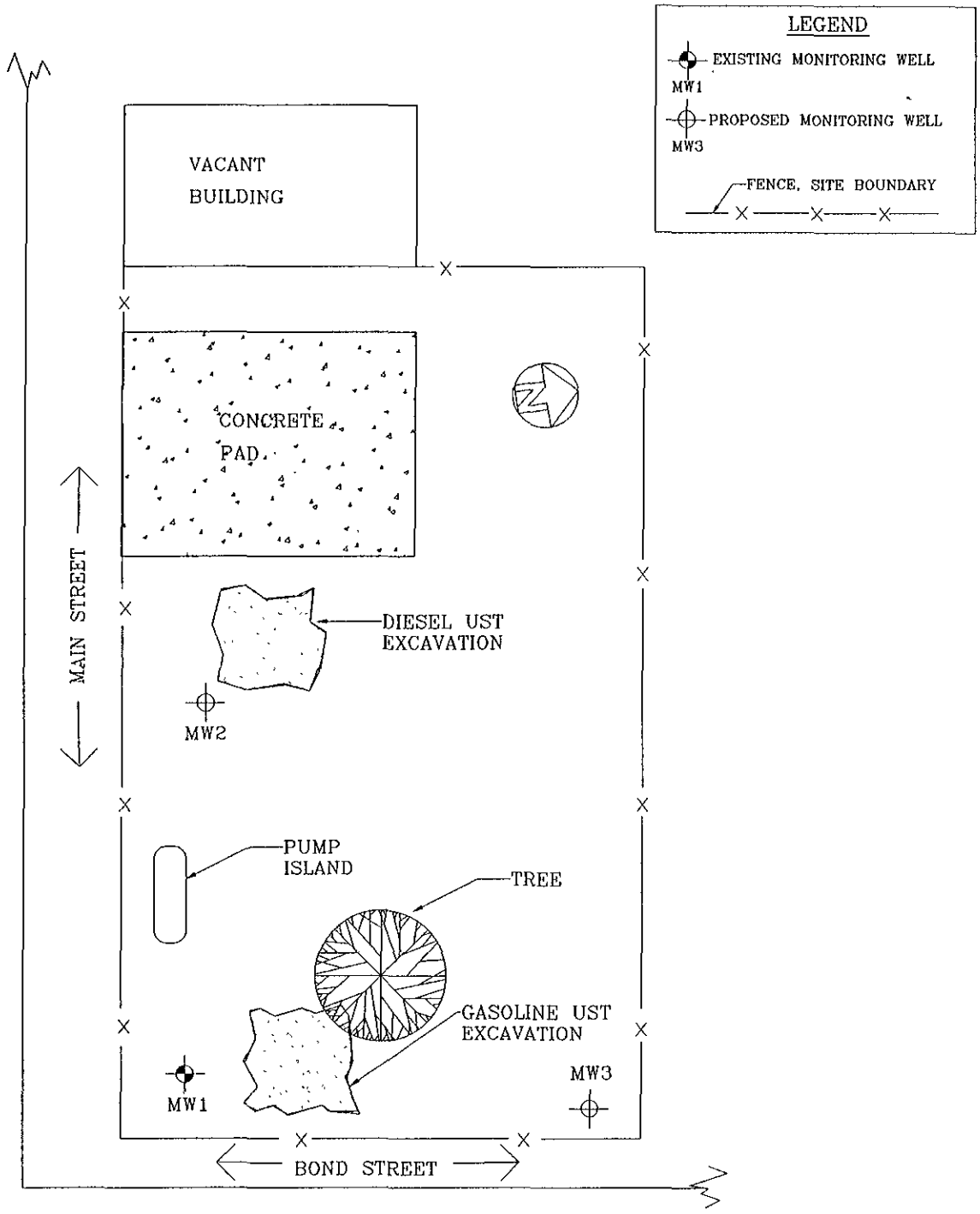

ENVIRONMENTAL
BIO-SYSTEMS, INC.

DATE:
5/12/93

DRAWN BY:
DAS

SCALE:
1" = 25'

FIGURE 2: SITE DIAGRAM

Former Chevron Station
11727 Main Street
Sunol, California