ORO LOMA SANITARY DISTRICT

2600 GRANT AVENUE
SAN LORENZO, CALIFORNIA 94580
TELEPHONE 510 276-4700
ADMINSTRATION FAX 510 276-1528
PLANT FAX 510 278-7382

Directors:
Howard W. Kerr, President
Frank V. Sidari, Vice President
Laython N. Landis, Secretary
Herbert G. Crowle, Director
Roland J. Dias, Director
General Manager:
Michael C. Cameron

STID 1996

January 15, 1999

Mr. Amir K. Gholami
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

SUBJECT: GASOLINE TANK SITE CLOSURE (JOB NO. 45-264-03)
2600 GRANT AVENUE, SAN LORENZO, CA 94580

Dear Mr. Gholami:

In response to your letter dated December 28, 1998, enclosed is a copy of the Work Plan for Installation of Groundwater Monitoring Wells for your review and approval. We were surprised to learn of the 10 new additional tests you are now requiring. Our groundwater monitoring plan was completed and ready for submittal when we received your letter. Please advise us the reasons for these new requirements.

Please call me at (510) 276-4700, extension 131, if you have any questions.

Sincerely,

Michael P.E.

Mike Cortez, P.E.
Associate Engineer

P:\USERS\CORTEZ\CIP\OPERATIO\GASOLINE\ACEHS03.WPD

December 18, 1998
Project No. 3022.9

WORK PLAN
for
INSTALLATION OF GROUND WATER MONITORING WELLS

in the vicinity of the former

1,000 Gallon Gasoline Tank
at the
ORO LOMA SANITARY DISTRICT SERVICE CENTER
SAN LORENZO, CALIFORNIA

PREPARED FOR

Mr. Mike Cortez
ORO LOMA SANITARY DISTRICT
2600 Grant Avenue
San Lorenzo,CA 94580

PREPARED BY

THE SUTTON GROUP

REGISTERED PROFESSIONAL ENGINEER
JOHN R. SUTTON
LIC. No. 40324
EXP. 12/31/02
CIVIL
STATE OF CALIFORNIA

John R. Sutton
Civil Engineer No. 40324
expires 12/31/2002

THE SUTTON GROUP
Engineering and Environmental Services
1480 Moraga Rd., Ste I, Moraga, CA 94556-2006
phone (925) 631-1688 f fax (925) 631-1371

WORK PLAN
for
1 INSTALLATION OF GROUND WATER MONITORING WELLS
in the vicinity of the former
1,000 Gallon Gasoline Tank
at the
ORO LOMA SANITARY DISTRICT SERVICE CENTER
SAN LORENZO, CALIFORNIA

TABLE OF CONTENTS

Page No.

1 INTRODUCTION 1
1.1 Statement of Scope of Work 1
1.2 Site Location 1
1.3 Background / Site History 1
2 SITE DESCRIPTION 1
2.1 Site Conditions 1
2.2 Subsurface Conditions 2
2.3 Ground Water Conditions 2
2.4 Hydrogeology 2
3 MONITORING WELLS 2
3.1 Borings 3
3.2 Logging and Soil Sampling 3
3.3 Monitoring Well Construction 3
3.4 Soil Cuttings And Collected Water Management 4
3.5 Ground Water Sampling 4
4 CHEMICAL ANALYSIS OF SAMPLES 4
5 HEALTH AND SAFETY 5
6 EVALUATION AND REPORT 5
7 PERSONNEL 5
8 LIMITATIONS 5
9 REFERENCES 6

TABLE OF FIGURES

FIGURE 1 Site Location Map
FIGURE 2 Plant Location Map
FIGURE 3 Location Map: Proposed Ground Water Monitoring Wells

WORK PLAN
for
1 INSTALLATION OF GROUND WATER MONITORING WELLS
in the vicinity of the former
1,000 Gallon Gasoline Tank
at the
ORO LOMA SANITARY DISTRICT SERVICE CENTER
SAN LORENZO, CALIFORNIA

1 INTRODUCTION

1.1 Statement of Scope of Work

This work plan describes installation and sampling of three ground water monitoring wells to be installed in the vicinity of a former 1,000 gallon underground fuel storage tank, removed in 1994. The Oro Loma Sanitary District (The District) proposes to install and monitor these wells in response to a request by Alameda County Environmental Health Services Department's Environmental Protection Division, (ACEH) in a letter dated August 26, 1998. This work supplements the District's previous investigations, remedial efforts, including tank removal, soil removal, subsurface soil and ground water sample collection, and an ASTM-RBCA Tier-1 evaluation of risk to human health and the environment evaluation for the site vicinity, subsequent to initial discovery of the leak in 1993.

This work plan has been prepared under the direction of a California-registered Civil Engineer in accordance with local and State of California laws and regulations.

1.2 Site Location

The subject 1,000-gallon, underground gasoline storage tank was located in the parking lot of the District's Service Center at 2600 Grant Avenue, San Lorenzo, in un-incorporated Alameda County. The tank location was to the west of the Engineering Building and south of the Maintenance Building. The site vicinity is shown on Figure 1, and the site location more specifically in relation to the District facilities on Figure 2.

1.3 Background / Site History

The complete Background and history of this site are provided in numerous work plans and reports on file with the Alameda County Health Department and other regulatory agencies. Section 10, "References" below includes a listing of these documents.

2 SITE DESCRIPTION

2.1 Site Conditions

The site vicinity of the District sewage treatment plant facility and adjacent Service Center is generally level. The grade ranges from elevations 6 to 9 feet above mean sea level (msl). The subject site is located approximately 1,000 feet inland from the San Francisco Bay shoreline.

2.2 Subsurface Conditions

The subsurface profile on the District property comprises man-made fill placed over bayland deposits. The bayland soils immediately underlying the fill soils often have a peat layer or crusted clay surface, which is typically brown to black, about one foot thick, and with a noticeable organic odor. In many of the borings a layer of fine, gray to black sand, which was typically clean but with silty or clayey stringers, and varying in thickness from one to three feet underlay the crust. The top of this sand layer was at from three to six feet depth where found, which is at the approximate native soil interface. The crust, peat and sand layers were underlain by characteristic green to black, moderately to highly plastic, Bay Mud clays, which are organic.

In the borings in Grant Avenue, gravely fill extended to approximately five feet depth. The profile was typical, except for a layer of brown, fibrous peat found at 12 to 13½ feet depth.

Previous investigations have shown that the Bay Mud clays extend to about 25 feet, with brown clays below. Previous geotechnical investigations have extended to as deep as 51 feet.

2.3 Ground Water Conditions

Ground water depth has been measured in temporary wells drilled for the previous investigations. Ground water depth ranged from 4½ to seven feet in those borings. Ground water in summer 1998 was shallower than previously noted, likely a result of high rainfall in the winter of 1997-98.

2.4 Hydrogeology

It has previously been shown (Sutton, 1998) that on-site shallow ground water flow is essentially within the sand layer at approximately six feet depth within the impervious Bay Mud. Ground water from the former tank site flows generally southwesterly, until it is intercepted by a sewer branch which crosses the District's parking lot, and to the south (down gradient) until intercepted by the line of an abandoned sewer main trench within the Grant Avenue sidewalk. The on site sewer branch directs flow into the 'sidewalk main' trench. The gravel backfill and westerly grade of the trench provides a preferential pathway, which transports the flow west into the District's POTW. This barrier effect was previously illustrated on the Benzene in Ground Water Iso-Concentration Map, which is the basis of Figure 3.

3 MONITORING WELLS

The proposed monitoring wells will be located as shown on Figure 3. One of the wells will be located within the District's paved parking lot. The other two will be in the paved portion of Grant Avenue.

3.1 Borings

Three borings will be drilled in the locations shown on Figure 3. The borings will be permitted through Alameda County Public Works Department. Boring locations will be marked on the ground or staked based on measurements from the site boundaries or other landmarks. The boring sites will be surveyed by Underground Service Alert (USA) in advance of rig mobilization. Borings will not be relocated without the approval of the engineer-of-record.

A truck-mounted drill rig equipped with 8-inch diameter hollow stem augers will be used to complete the borings. All equipment will be steam-cleaned prior to drilling. The sampler will be cleaned with a laboratory grade detergent and rinsed with clear and then distilled water between samples. Thus, cross-contamination will be minimized.

Borings will be extended to approximately 15 feet depth. They may be terminated at a shallower depth if a minimum of five feet of clay, acting as an aquitard is encountered at shallower depth. The borings will be completed as monitoring wells.

3.2 Logging and Soil Sampling

The soil borings will be logged by an appropriately qualified engineer or geologist from The Sutton Group. Soil samples will be collected as each hole is advanced. Selected soil samples will be tested for chemical properties.

Soil samples will be classified in the field using the Unified Soil Classification System. All soil samples will be screened on-site using a portable photo-ionization detector (PID). Samples will be labeled with the project number, boring number, sample depth interval and date of collection. The soil samples will be appropriately packed, refrigerated and transported to the chemical analytical laboratory for testing.

A chain-of-custody form will be initiated by the sampler and accompany the soil samples to the laboratory. All samples collected for chemical analysis will be delivered under chain-of custody to the District's chemical analysis contractor.

Soil samples selected for physical analysis will be field screened for volatile organics to assure there is no potential adverse hazard to the shipper or receiver prior to dispatch to the appropriate laboratory.

3.3 Monitoring Well Construction

The borings will be converted to monitoring wells utilizing 2" schedule 40 threaded PVC pipe and factory-slotted screen. The perforations will extend approximately 10 feet below and one foot above the upper zone of saturation. The perforated section annulus will be packed with clean graded sand. Due to the shallow depth of ground water, sand will extend to a level approximately two feet above the highest screen slots. The wells will then be surged to consolidate the sand pack and a one-foot thick bentonite plug will be placed over the sand pack. The remaining annulus will be backfilled with a cement/bentonite slurry to grade.

The wells will be finished with a traffic rated concrete or metal box grouted to match the existing grade. The wells will be completed with a locking cap to guard against vandalism. No solvents or glues will be used during monitoring well construction.

After installation, the wells will be developed utilizing surging, hand bailing or a submersible pump. Development will consist of the rapid removal of water from the well until the water is relatively free of sand, silt, and turbidity.

3.4 Soil Cuttings And Collected Water Management

The soil cuttings will be placed on visqueen at a designated location on the site, for eventual disposition by the District. Excess recovered ground water and rinsate from the cleaning will be temporarily contained in 55-gallon drums at the project site and later, with District approval, discharged into the sanitary sewer system for treatment at the District's POTW.

3.5 Ground Water Sampling

The initial samples will be collected from each well following development. Additional samples will be collected at three-month intervals, for a total of four sampling events.

Following water level measurement, the monitoring wells will be sampled using new, disposable bailers. Prior to sample collection, a minimum of three well-casing volumes of water will be purged in an attempt to collect a representative formation sample. Should a well become completely evacuated during purging, samples will be collected after the well has recovered to 80 percent of this initial water elevation.

All samples collected will be placed in containers provided by the laboratory for the type of analyses required. Following the addition of any preservatives required per EPA approved sampling protocols, the samples will be labeled and immediately placed in refrigerated storage.

All samples will be labeled in such a manner as to maintain client confidentiality. A chain-of-custody form will be initiated by the sampler and accompany the samples to the analytical laboratory. All soil and water samples collected will be delivered to a laboratory approved by the California Department of Health Services for the type of analysis to be performed.

4 CHEMICAL ANALYSIS OF SAMPLES

The District has contracted Sequoia Analytical Laboratory of Redwood City California for transport and chemical analysis of the soil and ground water samples. Sequoia is an independent, California EPA-certified hazardous waste testing laboratory (ELAP No. 1210), accredited to perform the analyses in accordance with the San Francisco Bay Regional Water Quality Control Board, and the Alameda County Health Department's Hazardous Materials Program's guidelines for analysis of petroleum fuels releases from underground tanks.

Soil samples will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethyl benzene and xylenes using EPA methods 5030, and 8020, in accordance with Table 2 of the "Tri-Regional Guidelines, dated August 1990.

Ground water samples will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethyl benzene, xylenes, and methyl tert-butyl ether (MTBE) using EPA methods 5030 and 8020, in accordance of the "Tri-Regional Guidelines, (RWQCB 1990).

5 HEALTH AND SAFETY

The work shall be performed in accordance with the District's Health and Safety Programdated January 1, 1993, prepared by Levine Fricke, Inc. which is appended by reference.

6 EVALUATION AND REPORT

The Sutton Group will provide quarterly sampling results for District review and submittal to ACEH. Following the year's sampling, we will evaluate the data and prepare a written report describing field and laboratory results for subsurface soil sampling, well installation details, and ground water sampling results. Following review, the District should submit copies of the quarterly sampling and final report to Alameda County Environmental Health Department, Hazardous Materials Division.

7 PERSONNEL

This Work Plan has been prepared by The Sutton Group, under the direction of John R. Sutton, PE, California Registered Civil Engineer, No. 40324, and Geotechnical Engineer No. 812, with expiration date December 31, 2002.

The Engineer-of-Record for the proposed ground water monitoring well installation will be Mr. Sutton, who has over 20 years of geo-environmental engineering experience, and has been responsible for, and directly involved in hazardous waste investigations in northern California since 1986.

The work will be performed under appropriate health and safety guidelines, by technical staff, including subcontractors who have been trained in the hazardous waste operations requirements "HAZWOPER" of 29CFR 1910.120.

8 LIMITATIONS

This work plan has been prepared according to generally accepted geologic, geotechnical and environmental engineering practices. No other warranty, either expressed or implied is made. The analysis, conclusions and recommendations contained in this work plan are based on review of customer-provided data and other available documents relevant to the site conditions. Changes in the information or data gained from any of these sources could result in the need for changes in conclusions and the recommended scope of work. If such changes do occur, we should be advised so that we can review this document and the work scope in light of these changes.

9 REFERENCES

RWQCB, 1990 Tri-Regional Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, Prepared jointly by staff of the North Coast, the San Francisco Bay, and the Central Valley Regional Water Quality Control Boards, dated 10 August 1990

RWQCB, 1992 Water Quality Control Plan, San Francisco Bay Basin Region (2), San Francisco Bay Regional Water Quality Control Board, 1986, and amended through 1992

The Sutton Group, 1994 Stage II Tank Removal Investigation, 1,000 Gallon Gasoline Tank Site at 2600 Grant Avenue, San Lorenzo, California, prepared for Oro Loma Sanitary District, San Lorenzo, California, dated November 23, 1994.

The Sutton Group, 1995 Report of Removal of 1,000 Gallon Gasoline Tank Oro Loma Sanitary District Service Center, San Lorenzo, California, dated June 7, 1995.

The Sutton Group, 1995a Report of Geotechnical Investigation for 1,000 Gallon Gasoline Tank Site Closure at 2600 Grant Avenue, San Lorenzo, California, prepared for Oro Loma Sanitary District, San Lorenzo, California, dated August 30, 1995

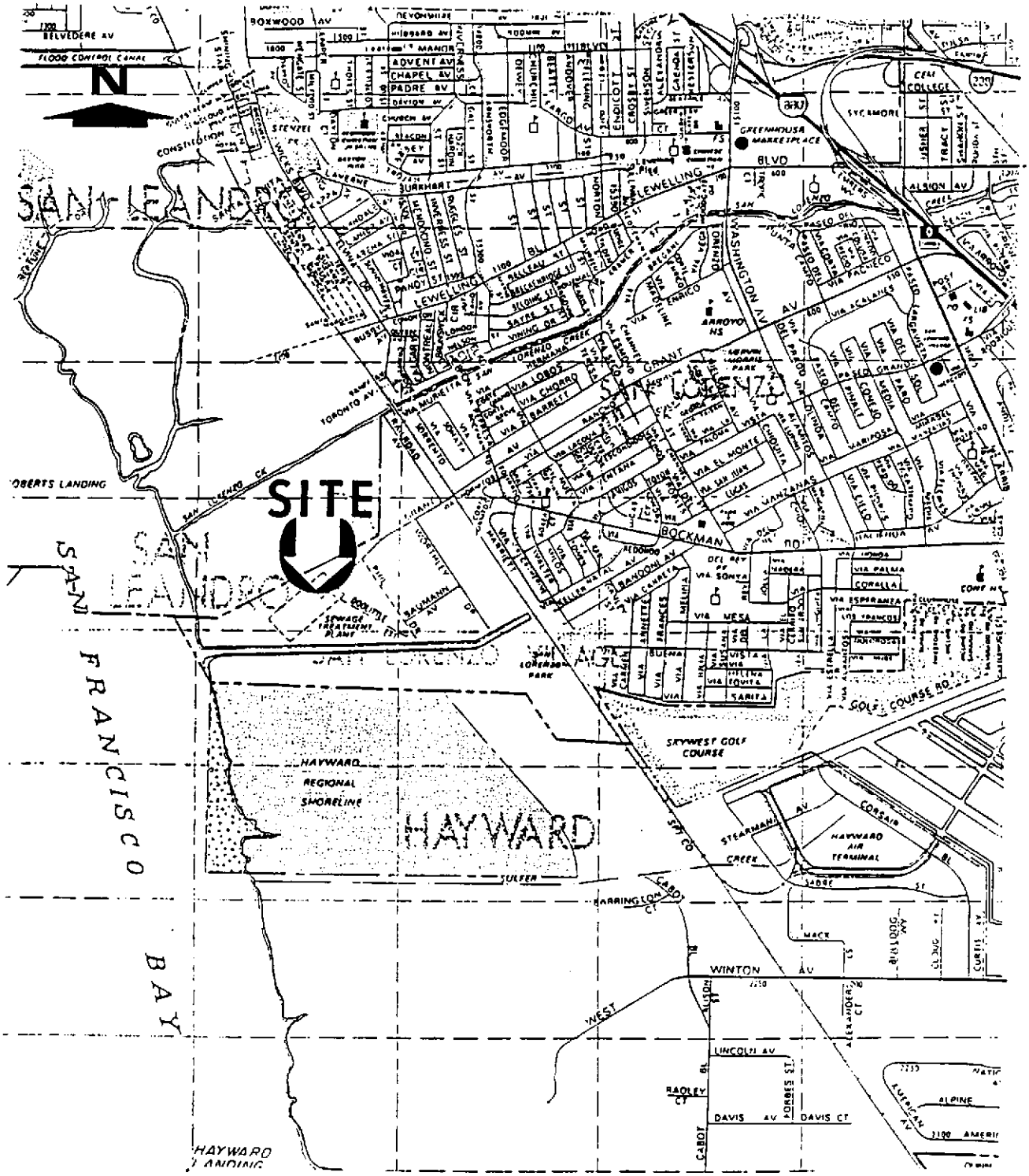
The Sutton Group, 1995b Remedial Investigation, Feasibility Study and Proposed Corrective Action Plan for 1,000 Gallon Gasoline Tank Site at 2600 Grant Avenue, San Lorenzo, California, prepared for Oro Loma Sanitary District, San Lorenzo, California, dated December 6, 1995.

The Sutton Group, 1996. Report of Soil and Ground Water Investigations at the Former Site of a 1,000 Gallon Gasoline Tank at the Oro Loma Sanitary District Service Center, San Lorenzo, California. Prepared for Mike Cortez, Oro Loma Sanitary District. May 15, 1996.

The Sutton Group, 1997. Work Plan for Supplemental Site Evaluation in the vicinity of the former site of the 1,000 Gallon Gasoline Tank at the Oro Loma Sanitary District Service Center, San Lorenzo, California. Prepared for Mr. Mike Cortez, Oro Loma Sanitary District, October 23, 1997.

The Sutton Group, 1998. Report of Supplemental Soil and Ground Water Investigations at the former Site of a 1,000 Gallon Gasoline Tank at the Oro Loma Sanitary District Service Center, San Lorenzo, California. Prepared for Mike Cortez, Oro Loma Sanitary District. July 13, 1998

OoooOOOoooo



SOURCE: THOMAS BROS MAPS. ALAMEDA COUNTY, CALIFORNIA Scale 1" = 2500 feet

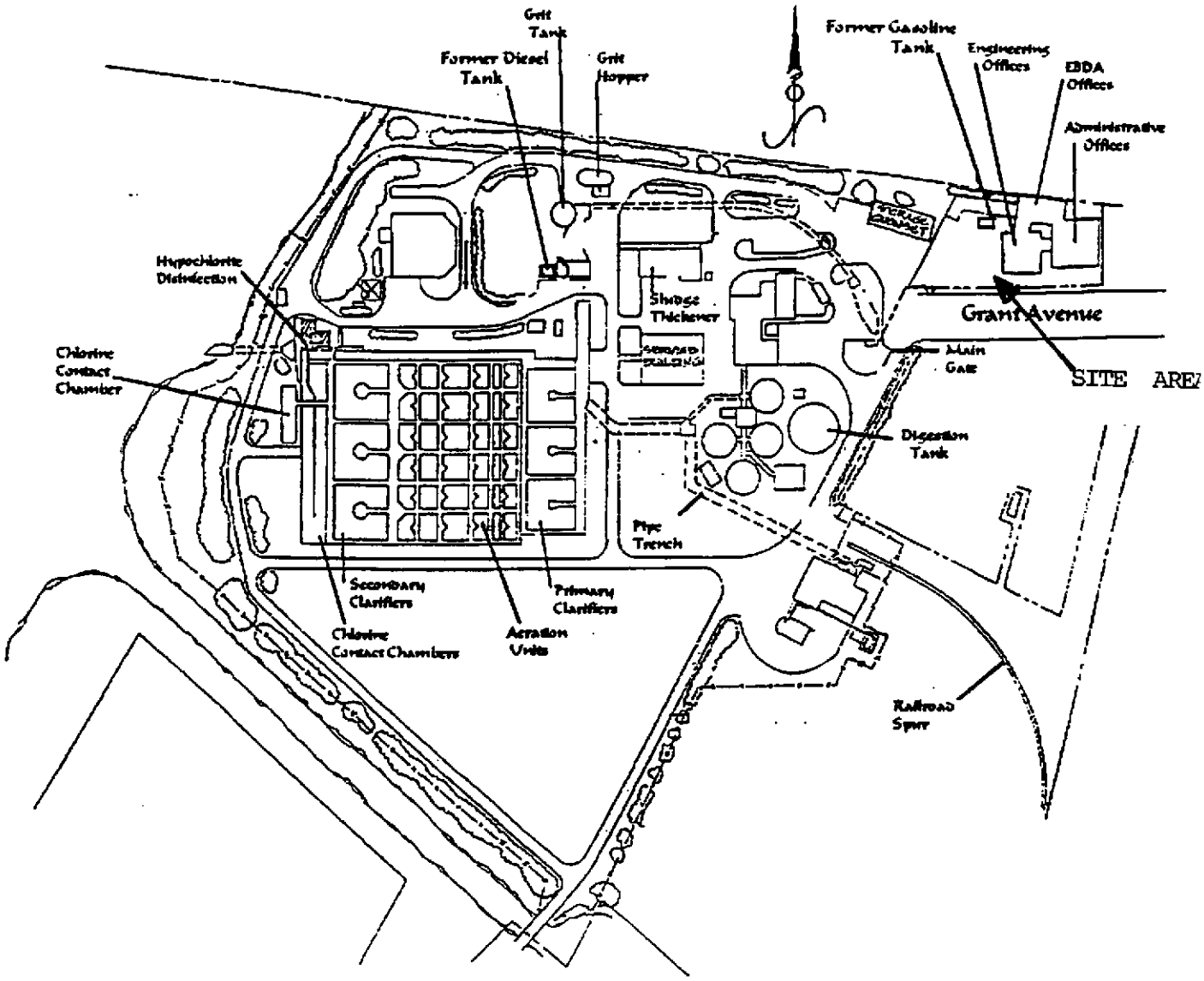
THE SUTTON GROUP
Engineering and Environmental Services
1480 Moraga Rd, Suite I
Moraga, California 94556-2006
phone (510) 631-1688
FAX (510) 631-1371

SITE LOCATION MAP
WORK PLAN FOR
MONITORING WELL INSTALLATION
1,000 Gallon Gasoline Tank Site
ORO LOMA SANITARY DISTRICT
San Lorenzo, California

PROJECT No. 3022.9

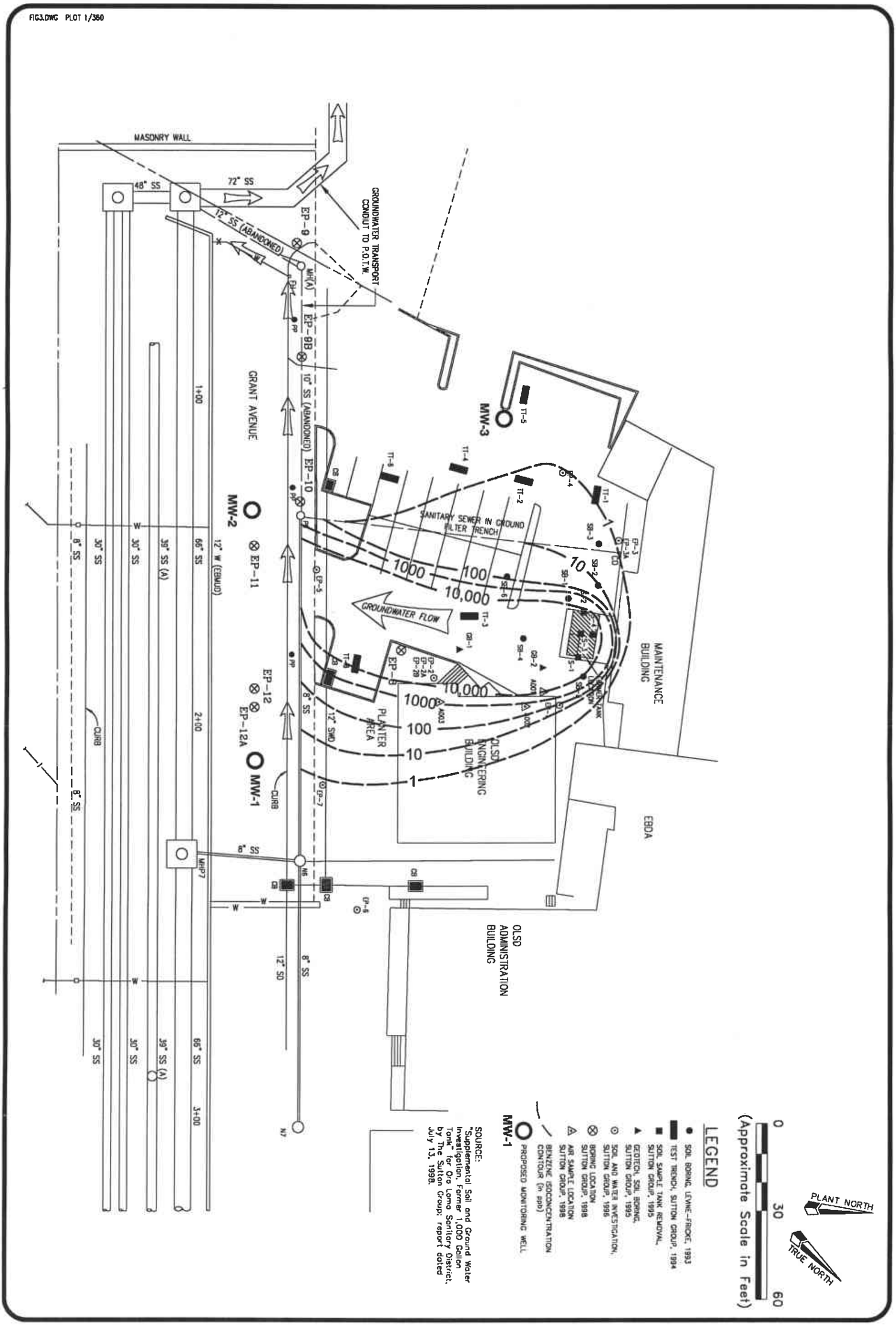
FIGURE 1

Revision o, 12/21/98



SITE PLAN

THE SUTTON GROUP *Engineering and Environmental Services* *1480 Moraga Rd, Suite I* *Moraga, California 94556-2006* *phone (510) 631-1688* *FAX (510) 631-1371*	**PLANT LOCATION MAP** **WORK PLAN FOR** **MONITORING WELL INSTALLATION** **1,000 Gallon Gasoline Tank Site** **ORO LOMA SANITARY DISTRICT** **San Lorenzo, California**	PROJECT No. 3022.9 FIGURE 2 Revision o, 12/21/98



THE SUTTON GROUP
Engineering and Environmental Services
1480 Moraga Road, Suite I
Moraga, California 94556
Phone (925) 631-1688
fax (925) 631-1371

Location Map - Proposed Ground Water Monitoring Wells

1,000 Gallon Gasoline Tank Area
ORO LOMA SANITARY DISTRICT
SAN LORENZO, CALIFORNIA

PROJECT NO. 3022.9

FIGURE 3

12/21/98