GeoSolv, LLC
ENVIRONMENTAL AND HYDROGEOLOGICAL CONSULTING

We Don't Just Work On Your Environmental Problems; We Solve Them!

March 11, 1997

Scott Seary
Alameda County Health Care Agency
Environmental Protection Division, Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor, Room 250
Alameda, CA 94502
(510) 567-6774 Phone, (510) 337-9335 Fax

SUBJECT: **WORKPLAN FOR THE INSTALLATION OF ONE GROUNDWATER MONITORING WELL AND TEN BOREHOLES TO INVESTIGATE TWO CLUSTERS OF UNDERGROUND STORAGE TANKS (USTs) AT THE FORMER GLOVATORIUM / THE LEATHER CLEANERS**
SITE LOCATED AT: **3815 BROADWAY , OAKLAND, CA 94611**

Dear Mr. Seary,

GeoSolv, LLC has been retained by Stuart and Robert Depper to satisfy the initial requirements of an October 31, 1997 letter regarding the site listed above. In that letter, the court has required that the responsible party to produce a workplan for a subsurface hydrogeologic investigation.

The purpose of this investigation will be to determine whether or not the two existing UST clusters have impacted the soil and groundwater beneath the site. If it is determined that one or both locations have been impacted by petroleum hydrocarbons, then the data collected from this investigation will be used to perform a detailed site characterization, based on a "phased approach," followed by a Risk-Based Corrective Action (RBCA) study to determine site specific cleanup levels, if applicable.

This investigation will include the drilling of ten (10) Geoprobe boreholes around the two locations (i.e. a total of 10 borings), to an approximate depth of 15 feet below ground surface (bgs). The open boreholes will yield chemical concentration data from soil samples and water samples. One eight inch diameter groundwater monitoring well will be installed, onsite, to be correlated with the water levels of two offsite wells, after access to those wells has been secured.

GeoSolv, LLC would like to begin this phase of work as soon as possible, so your immediate attention would be greatly appreciated. If you have any questions regarding the workplan, please contact me.

Sincerely,

Franklin J. Goldman

Franklin J. Goldman
CEO/GeoSolv, LLC
Certified Hydrogeologist No. 466

WORKPLAN FOR INSTALLATION OF ONE GROUNDWATER MONITORING WELL AND TEN BOREHOLES TO INVESTIGATE TWO CLUSTERS OF UNDERGROUND STORAGE TANKS (USTs)

AT

THE FORMER GLOVATORIUM / THE LEATHER CLEANERS SITE
3815 BROADWAY , OAKLAND, CA 94611

PREPARED FOR:
Robert Depper

SUBMITTED TO:
Scott Seary
Alameda County Health Care Agency
Environmental Protection Division
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor, Room 250
Alameda, CA 94502

PREPARED BY:
Franklin J. Goldman

Franklin J. Goldman

Franklin J. Goldman, Certified Hydrogeologist No. 466

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1.0 WORK PLAN SUMMARY

1.1 INTRODUCTION

Site Location and Description

The project site is located at 3815 Broadway, Oakland,, California (**See Figure 1**). The site once housed dry cleaning facilities. The property contains two clusters of existing stoddard solvent Underground Storage Tanks (USTs): One cluster contains two USTs (1000 and 4,000 gallons) outside the building area by the sidewalk, and the other cluster contains four USTs (800, 800, 1000, and 3,500 gallons) inside the building area (**See Figure 2**). The site topography overall is moderately flat and is located in an older industrial/commercial area, just north of downtown Oakland. The buildings connected to the subject site's structures are very old and their structural integrity is in question. The surface of the property is covered by 95% concrete slabs, concrete sidewalks and asphalt. The site has utilized municipal supply water.

Statement of Work

This project includes the drilling and installation of 10 two-inch diameter boreholes to an approximate depth of 15 feet below ground surface. Each of the two existing UST clusters will be surrounded by borings to provide sufficient coverage. The borings will be adequately spaced so as to cover as much ground as possible for each location (**See Attached Figure 2**). The borings will be continuously cored with a Geoprobe drilling rig equipped with a two-inch inner diameter Macro-core sampler containing, a clear, four foot long, acetate liner. Soil samples will be collected at approximately four-foot vertical intervals, at the capillary fringe, at significant changes in lithology, and/or at contact with hydrocarbon contamination. A minimum of two soil samples and one groundwater sample will be collected from each borehole. Each water sample will be collected with a stainless steel bailer, after development and purging of the open boreholes. The soil and groundwater samples will be delivered to a State certified laboratory for analysis of total petroleum hydrocarbons as stoddard solvent (TPH-ss) using EPA modified Method 8015 and for solvents using EPA Method 8010. In addition, one 8 inch diameter groundwater monitoring well, with a 2 inch, schedule 40, 0.02 inch PVC, slotted casing, will be installed, by a hollow-stem auger drill rig, to a depth of approximately 15 feet bgs. A water level reading will be measured and a water sample will be collected, with a stainless steel bailer, after proper purging and development. All well locations will be surveyed by a certified land surveyor. The soil and groundwater samples will be placed in an ice chest at a temperature of four (4) degrees Celsius. The samples will be submitted to a State-Certified laboratory under Chain-of-Custody requirements for analysis.

Background

The six underground storage tanks located onsite are no longer in use and were used to store stoddard solvent for a dry cleaning operation. High levels of chlorinated solvents were identified in the USTs located just south of the Depper's property at 316 38th Street. A subsurface investigation performed for the Unocal site located to the north of the site indicates that the prevailing groundwater

gradient direction is from northeast to southwest. One shallow groundwater monitoring well is located onsite which is perforated into the backfill of a sump. The depth to groundwater is expected to be less than 10 feet bgs.

2.0 SITE WORK

Site work will be conducted in a phased manner to accommodate for responsible changes in the scope of work as additional information is gathered during the investigation. The overall project is outlined below.

2.1 Subsurface Site Characterization

1. Submit Work Plan to the Alameda County Department of Environmental Health and the San Francisco Regional Water Quality Control Board for approval.

2 Obtain the proper permits for the drilling and installation of boreholes and wells

3. Notify Scott Seary 72 hours prior to commencement of site work.

4. Locate and mark drilling area with white paint and notify Stuart Depper at least 72 hours prior to commencement of site work.

5. Notify Underground Service Alert (USA), (800) 227-2600, 48 hours prior to commencement of work.

6. Drill 10 Geoprobe soil borings to a depth of approximately 15 feet bgs. Later, one 8 inch diameter groundwater monitoring well will be installed after evaluation of the data collected from the borings. ~~One groundwater and up to two soil samples will be collected from each boring.~~ One water sample will be collected from the well.

7. The Geoprobe will produce approximately two to three five-gallon buckets of drill cuttings and will be left on site pending laboratory analysis. The one groundwater monitoring well's soil cuttings will be stored and covered on 6 mil thick visqueene pending laboratory analysis. All rinseate and purged water will be stored on-site in DOT approved 55-gallon drums for later disposal.

8. A report will be prepared and submitted to the County and the Regional Board. The report will include a site history, summary of all findings, laboratory results and recommendations for further action, if necessary.

2.2 GEOLOGY AND HYDROGEOLOGY

Regional Geologic Setting

The site is located on the East Bay Plain near the east shore of San Francisco Bay. The site is underlain by Quaternary Pleistocene deposits of the Temescal formation (Qtc). The formation covers most of the surface in this area. It ranges in depth from between five to sixty feet and consists of contemporaneous alluvial units of varying, origins, lithologies, and physical properties. The material ranges from irregularly bedded clay, silt, sand and gravel to lenses of clay, silt, sand, and gravel with Claremont Chert. Much of the material is derived from underlying sandstone of the Franciscan group. The formation overlies the Alameda formation.

The Hayward Fault is northeast of the site and is an active historic Fault. It is the only known barrier to groundwater movement, affects all water bearing sediments as it trends northwest-southeast between Castro Valley and Hayward.
The site could be underlain by fill soils of unknown origin.

Hydrogeology

Groundwater in the East Plain Area, of the Santa Clara Valley basin, occurs in unconsolidated Quaternary alluvium. Five formations overlie the bedrock (from topmost downward): bay mud, the Merritt sand, the Posey formation, the San Antonio formation and the Alameda formation. The Merritt sand supplies fresh water for shallow wells; aquifers in the Alameda Formation supply fresh water to deep wells. Known thickness of the water bearing materials is 760 feet. Non-water bearing rocks are exposed at Point Richmond Hills. Groundwater is less that 10 feet bgs at the site.

References:

Radbruch, Dorothy H., Areal and Engineering Geology of the Oakland West Quadrangle, California, Map I-239, 1957.
Bulletin No. 118 California's Ground water.
State of California. Department of Water Resources, September 1975 and January 1980.
Bulletin 63-5, Sea Water Intrusion in California.
State of California. Department of Water Resources, October 1975

3.0 REPORTING

Technical reports will be prepared and submitted to meet regulatory requirements. Reports will include site history, figures identifying sample locations, drilling logs, summary of all findings, analytical results and recommendations, for further action, if any. Groundwater gradient and chemical concentration contour maps may be included, if applicable.

4.0 GENERAL PRACTICES

GeoSolv, LLC's standard operating procedures for soil/water sampling meet or exceed guidelines set by EPA, State Regional Water Boards, County Environmental Health Departments. Drilling, construction, and completion of all exploratory borings and well installations will be in conformance with procedures in this document. ***GeoSolv, LLC*** also adapts and applies new techniques with the approval of the lead agency.

5.0 DRILLING PROCEDURES

All Geoprobe and hollow-stem auger drilling will be performed using an appropriate drill rig utilizing a drilling contractor who possesses a C-57 drilling license. All boring and logging will be performed by a State Certified Hydrogeologist.

The Geoprobe operator and the geologist, will discuss significant changes in material penetrated by the Geoprobe, changes in drilling conditions, hydraulic pressure, and drilling action. The geologist will be present during the drilling of exploratory borings and will observe and record changes by time and depth and will evaluate the relative moisture and content of the samples and note water producing zones. Lithologic descriptions will include soil or rock type, color, grain, size, texture, hardness, carbon content, and presence of gypsum and hydrocarbons. Hydrogeologic characteristics such a perched zones and confining conditions will also be evaluated. This record will be used later to prepare a detailed lithologic log.

6.0 SOIL CUTTINGS

The Geoprobe will produce approximately two to three five-gallon buckets of drill cuttings that will be left on site pending laboratory analysis. The one groundwater monitoring well's soil cuttings will be stored and covered on 6 mil thick visqueene pending laboratory analysis and eventual transport to a legal point of disposal. All rinseate and purged water will be stored on-site in DOT approved 55-gallon drums for later disposal.

7.0 SOIL SAMPLING IN BOREHOLES

U.S. Environmental Protection Agency standards serve as the foundation for all field sampling operations performed by ***GeoSolv, LLC***. EPA SW 846 is the primary publication from which procedures are derived.

7.1 Sample Intervals

Soil samples will be collected and cut at approximate four-foot vertical intervals by Geoprobe sampling, at significant changes in lithology, at the capillary fringe, and/or at obvious hydrocarbon contamination. Samples will be placed in an ice chest filled with ice, stored at four-degrees Celsius, and taken to a State Certified analytical laboratory for analysis of total petroleum hydrocarbons as stoddard solvent (TPH-ss) and for solvents using EPA method 8010.

7.2 Collection Devices

Soil samples obtained during drilling will be collected using a four-foot long, two-inch I.D. steel Geoprobe Macro-core sampler containing an acetate tube that covers the entire length of the sampler. ***Each borehole will be continuously cored to provide a complete picture of the subsurface lithology***. The sampler will be decontaminated before and after each use by steam cleaning, or an Alconox solution wash, and tap water or deionized water rinses. The sampler will be placed down the boring and driven or pushed four-feet into the soil using compressive force.

7.3 Soils Classification

The entire length (four-feet) of the sample will be examined by a geologist for obvious signs of contamination and classified according to the Unified Soil Classification System. By using the Geoprobe device, each boring will be continuously cored and will provide a very accurate lithology of the underlying soils. These observations will be recorded in the boring logs.

7.4 Sample Labeling and Chain of Custody

Soil samples from each boring will be labeled indicating project name (or number), sample number, sample depth, date and collection time. The same information will be recorded on the Chain-of-Custody.

8.0 WATER SAMPLE COLLECTION

or ?

Groundwater samples will be collected by placing either a stainless steel bailer down the center of each borehole to allow for an in-situ water sample collection. Water flows freely into the bailer and is then removed and the captured water placed in the appropriate sample media. The bailer will be decontaminated prior to each use.

Sample vials and bottles will be filled and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in vial and bottles approved by the US EPA. Some analyses may require separate containers in accordance with EPA methods described in 40 CFR Part 136 and SW-846.

Water samples intended for volatile hydrocarbon analysis will be contained in 40 ml VOA vials prepared according to EPA SW-849 and capped with Teflon-lined septa caps. Samples intended for EPA 692 analysis will contain a small amount of preservative (HCl). Samples intended for EPA 601 and EPA 624 GCMS procedures will not be preserved. Water samples intended for low level diesel analysis will be stored in dark glass 1-liter bottles to reduce degradation by sunlight. Antimicrobial preservative (HCl) may be added to the sample, if a prolonged holding time is expected prior to analysis.

9.0 FIELD EQUIPMENT DECONTAMINATION PROCEDURES

The sampler and bailer will be decontaminated before and after each use by steam cleaning or washing in an Alconox solution, followed by tap water, or deionized water rinses. Only clean water from a municipal supply will be used for decontamination of drilling equipment.

All rinseate water used in the decontamination process and all purged water from the use of wells/boreholes will be stored on site in steel DOT approved drums. Drums will be labeled as to contents, date container filled, company name, and sealed. The drums will be left on-site for subsequent disposal pending analytical results.

10.0 MONITORING WELL CONSTRUCTION

Wells are generally constructed using a 2 inch diameter, schedule 40 PVC, well casing from the bottom of the boring to the ground surface. The length of the 0.02 inch slotted screen will vary depending on the depth to groundwater, but will generally be between five to fifteen feet below grade surface and extend to the base of the well. A bottom and top PVC cap are placed at each end of the casing. The remainder of the well will be solid PVC casing. The No. 3 sand filter pack will be placed in the annular space between the 2-inch casing and the 8-inch borehole and will extend from the bottom of the well to approximately 2 feet above the top of the screened casing. A 4 to 6 inch layer of very fine sand will be place above the filter pack to prevent infiltration of bentonite and grout into the well. Successive alternating layers of dry bentonite pellets will be poured down the annular space followed by a stream of water for each layer for hydration. A steel tape will be used to verify the depth to the top of the sand pack during construction. A steel probe may be used to verify depths to the bentonite seal during construction and establish if bridging has occurred in the annular space. The bentonite seal will be approximately 2 feet thick. The saturated bentonite will be placed above the filter pack to an elevation of approximately one-foot bgs; The remaining space will be backfilled using a cement bentonite grout mixture. A raised secured well box and cap will be cemented in with a concrete apron over the top of the well to protect it from ground surface runoff and traffic. The wells will be completed at the ground surface and will be developed until the groundwater is visually clear and free of sediment (**see Figure 3**).

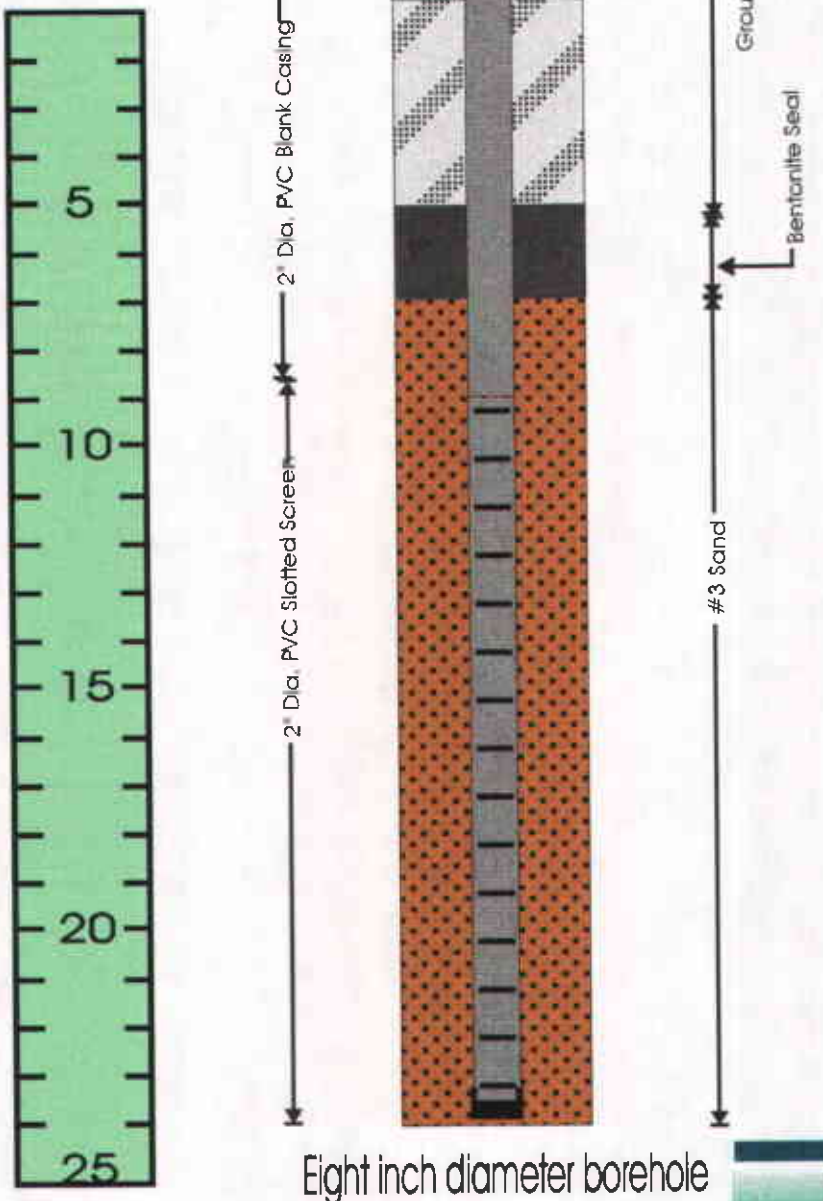
GeoSolv, LLC

643 Oregon Street, Sonoma, California 95476

GENERALIZED WELL CONSTRUCTION DIAGRAM

STUART DEPPER PROJECT
3815 BROADWAY
OAKLAND, CA

FEBRUARY 28, 1996



Eight inch diameter borehole

Figure 3

Vertical Scale : 1 inch=4 feet Horizontal Scale : 1 inch=8 inches

11.0 DEVELOPMENT OF WELLS AND BOREHOLES

When the well or borehole installation is complete, it will be developed by pumping with a Master Flex Peristaltic Pump. A separate silicon tube will be used for each sample point to prevent the tube from being dissolved by chlorinated solvents. Well development generally suppresses damage to the formation by drilling operations, restores natural hydraulic properties to the adjacent soils and improves hydraulic properties near the borehole so the water flows more freely in the well.

Before each well is sampled, enough groundwater will be removed from the well so that the temperature, conductivity, and pH have stabilized based on three consecutive readings from a Hydac Kit, which vary no more than 10 %.

12.0 EMERGENCY PROCEDURES

The following emergency response plan will be implemented to handle unanticipated on-site emergencies prior to start up of hazardous waste operations. All emergency incidents will be dealt with in a manner that minimizes adverse health risks to workers.

A. Emergency first aid procedures:

Employee injury: When possible, remove the employee from the contaminated zone and conduct decontamination procedures, first aid, and preparation for transport at a safe distance from the work site.

Eye exposure: Wash eyes with large amounts of potable water for at least 15 minutes; lift the upper and lower lids occasionally. Obtain medical attention.

Skin Exposure: Flush the contaminated skin with water for at least 15 minutes. Remove contaminated clothing. Obtain medical attention immediately when exposed to concentrated solids or liquids.

If paramedic/rescue services are required, they will provide transportation to the hospital. For less serious circumstances, the ***GeoSolv, LLC*** representative will provide transportation.

B. Emergency telephone numbers are given in the Site Specific Health and Safety Plan.

C. ***GeoSolv, LLC*** will document the emergency situation. It will include:

- A description of the incident (including the date and time) that necessitated emergency response procedures, and complete an accident/incident investigation or critique of the incident.

- The date, time, and names of all persons/agencies that were notified and their responses.
- The resolution of the incident (including its duration) and the method/corrective action involved.

On-Site Safety Items

All ***GeoSolv, LLC*** personnel engaged in field activities will have available at the job site the necessary health and safety items. Depending upon the job requirements, these may include the following: .

- First aid Kit
- Half Mask respirator
- Organic vapor or other appropriate cartridges
- Hard Hat
- Safety Glasses
- Hearing protection devices
- Protective gloves
- Chemical resistant coveralls (coated Tyvek)

APPENDIX A

Site Health and Safety Plan

SITE
HEALTH AND SAFETY PLAN
FOR
Robert and Stuart Depper
FORMER GLOVATORIUM / THE LEATHER CLEANERS SITE
3815 BROADWAY , OAKLAND, CA 94611

I. Site: **Same as above**

II. Key Personnel and Project Assignments

PROJECT ASSIGNMENT	NAME/AGENCY	PHONE
Principal Investigator	Frank Goldman	(707) 996-4227
Geologist	Frank Goldman	(707) 996-4227
Project Manager	Frank Goldman	(707) 996-4227
Site Safety Officer	Frank Goldman	(707) 996-4227
Owner:	Robert Depper	(510) 254-4049

III. Scope of Work

The project includes drilling of 10 Geoprobe soil borings and one standard groundwater monitoring well to approximately 15 feet below grade surface (bgs). All the Geoprobe borings will be sealed with grout after sampling. The boreholes will be used to determine the extent of the underlying soil and groundwater contamination, if any.

IV. Level of Protection

Level D - Level D is the basic work uniform.

V. SITE SECURITY

Only authorized personnel will be permitted within 20 feet of drilling equipment.

VI. EMERGENCY RESPONSE

A. Decontamination procedures for personnel injured or exposed in the work zone Assist the injured or exposed worker out of the sampling area when possible. If possible, carefully

remove his PPE, and remove your own, according to standard decontamination procedures administer CPR/first aid as needed. Call for medical help immediately.

B. Emergency Response Plan

Personnel roles, lines of authority, communications The on-site *GeoSolv, LLC* representative will have final authority on site health and safety methods concerning sampling.

C. Telephone numbers of emergency agencies, key contractor and responsible party.

	NAME/AGENCY	TELEPHONE
Ambulance	Alameda County	**911**
Hospital	Summit Medical Center 34th and Broadway Oakland	(510) 869-6600
Police Department	City of Oakland	**911**
Fire Department	City of Oakland	**911**
Project Manager	Frank Goldman	(707) 996-4227
Health/Safety Coordinator	Frank Goldman	(707) 996-4227
CA Dept. Health Services	DHS	(800) 554-0349
US EPA	Emergency Spills in California	(415) 974-8131
Federal OSHA	OSHA	(800) 648-1003
CHEMTREC	CHEMTREC	(800) 424-9300
Underground Service Alert	USA	(800) 227-2600

Directions to hospital (**See Figure 4 for route to hospital.**)

VII. JOB HAZARD ANALYSIS

SUBSTANCE	OSHA PER	ACGIH TVL	NIOSH REL

PCE	1 ppm	10 ppm	0.1 ppm

Toxicological hazards of PERC, (including local and systemic health effects) in general:

1. Benzene: Breathing of high concentrations of PERC may cause acute poisoning and death. Repeated inhalation of low concentrations often result in severe or fatal anemia. Also, an eye irritant and carcinogenic.

Physical hazards associated with site activities: Slip, trip, and fall hazards; safety hazards associated with construction equipment; excessive noise.

VIII. SITE CHARACTERIZATION AND ANALYSIS

A. Site Information

1. Location of site: 3815 BROADWAY , OAKLAND, CA 94611

2. Approximate size of site: 1 acre

3. Site topography: Flat. Most of the site is composed of old buildings.

4. Site Accessibility: Front accessible from Broadway.

5. Pathways for hazardous substance dispersion: The hazardous substance is a high volatile product which is likely to dissipate into the air. The primary path for dispersion is through the air, soil and groundwater.

6. Anticipated weather conditions, (temperature, humidity) and potential for heat/cold stress: Unpredictable weather conditions.

7. Past use of site: The site has always been used as a dry cleaning facility.

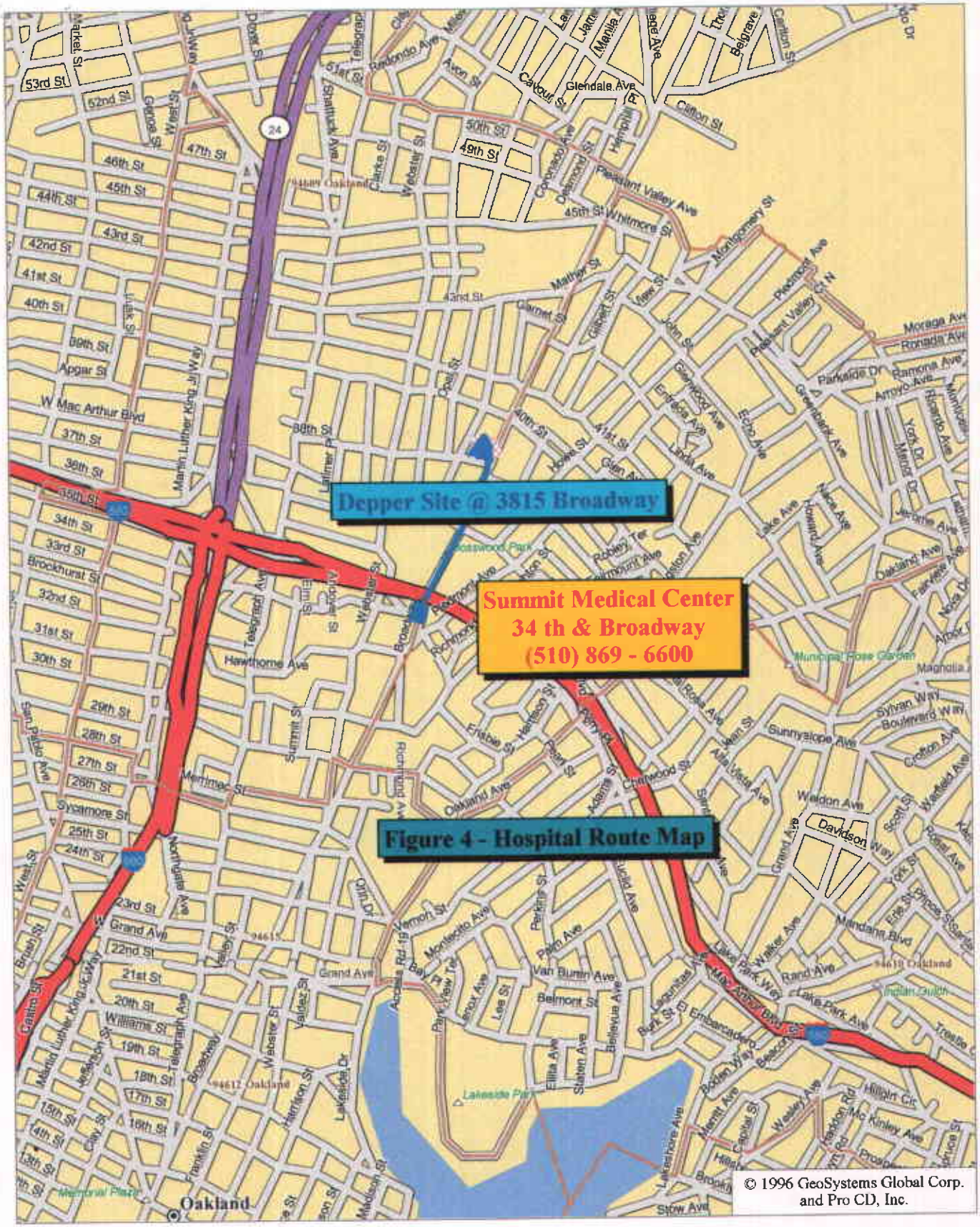
8. Current use of site: None.

B. Description of on-site wastes, (based on preliminary site evaluation)

1. Location: The soil and groundwater are possibly contaminated with stoddard solvent and maybe diesel

2. Physical state of hydrocarbons: Soil and water.

3. Chemical characteristics of wastes: stoddard solvent and maybe diesel


Depper Site @ 3815 Broadway
Summit Medical Center
34 th & Broadway
(510) 869 - 6600
Figure 4 - Hospital Route Map
Oakland
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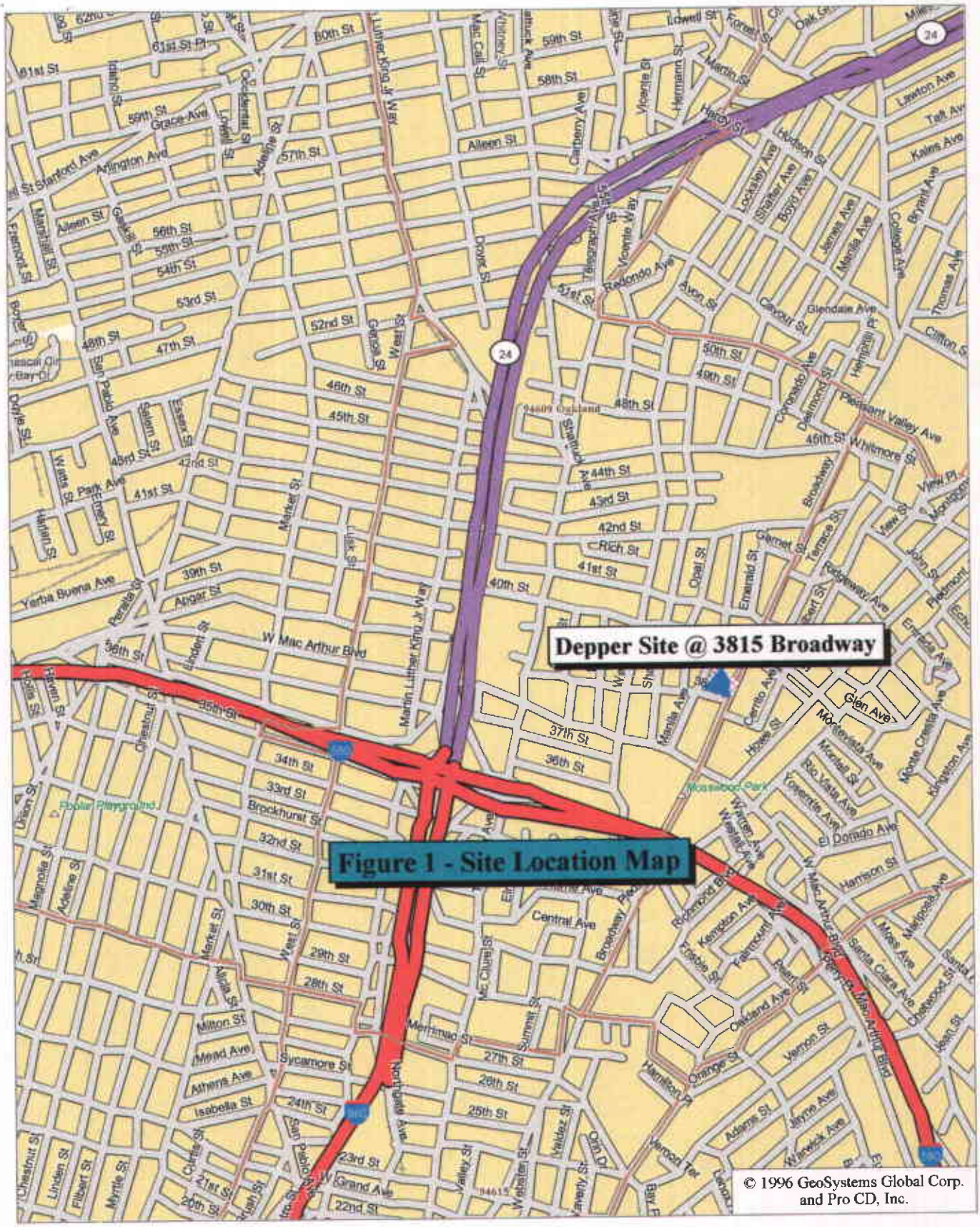
Depper Site @ 3815 Broadway
Figure 1 - Site Location Map
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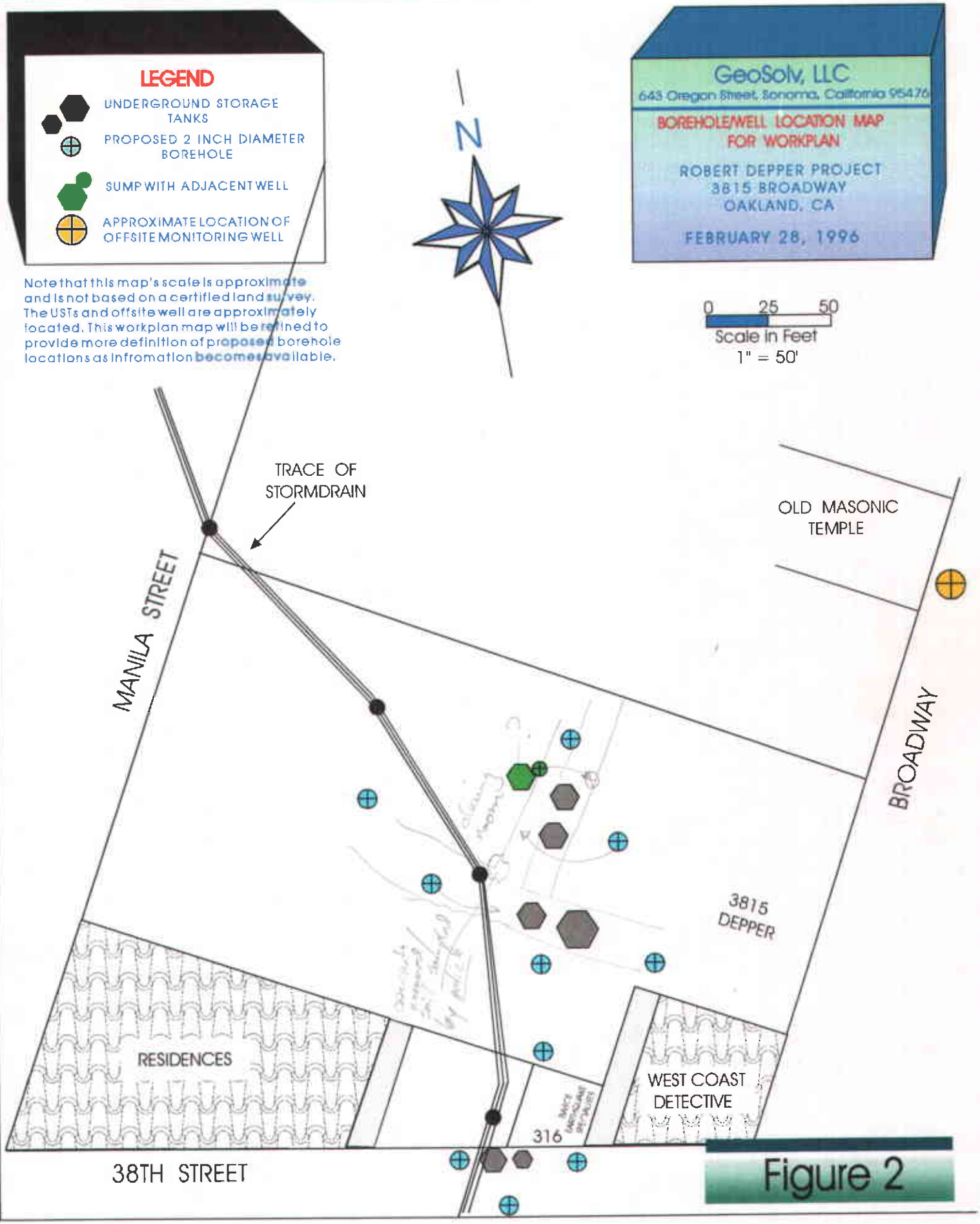
LEGEND
UNDERGROUND STORAGE TANKS
PROPOSED 2 INCH DIAMETER BOREHOLE
SUMP WITH ADJACENT WELL
APPROXIMATE LOCATION OF OFFSITE MONITORING WELL
Note that this map's scale is approximate and is not based on a certified land survey. The USTs and offsite well are approximately located. This workplan map will be refined to provide more definition of proposed borehole locations as infromation becomes available.
N
GeoSolv, LLC
643 Oregon Street, Sonoma, California 95476
BOREHOLE/WELL LOCATION MAP FOR WORKPLAN
ROBERT DEPPER PROJECT
3815 BROADWAY
OAKLAND, CA
FEBRUARY 28, 1996
0 25 50
Scale in Feet
1" = 50'
TRACE OF STORMDRAIN
MANILA STREET
OLD MASONIC TEMPLE
BROADWAY
3815 DEPPER
RESIDENCES
WEST COAST DETECTIVE
316
38TH STREET

Figure 2