Oakland
All-America City
1993

CITY OF OAKLAND

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Public Works Agency
Environmental Services

FAX (510) 238-7286
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RO 114

MAR 19 2002

March 15, 2002

Barney Chan
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

RE: Housewives Market Block, 801 Clay Street, Oakland, CA

aka 818 Jefferson St

Dear Mr. Chan:

Please find enclosed a copy of the geophysical investigation report on the subject site, prepared by NORCAL Geophysical Consultants, Inc., for the City of Oakland.

The geophysical investigation was conducted on February 7th, 2002. On February 8th, 2002, Peak Engineering, under direction from City staff, excavated at the areas identified as anomalies A, B and C. Temporary excavation pits were dug to approximately five feet below ground surface in a 10 square foot area at each anomaly location. Various piping and scrap metal were encountered, but no evidence of an underground tank was found at any of the locations.

Based on these results, I do not believe that any underground storage tanks remain in the portion of the subject site covered by this investigation. If you have any questions, you may contact me at (510) 238-7314 or mmgomez@oaklandnet.com.

Sincerely,

Mark Gomez
Environmental Program Specialist

NORCAL GEOPHYSICAL CONSULTANTS, INC.

February 25, 2002

MAR 1 9 2002

Mr. Bruce Abelli-Amen
Baseline
101 H Street, Suite C
Petaluma, CA 94952

Subject: Vacant Parcel
801 Clay Street, Oakland, CA

Dear Mr. Abelli-Amen:

This letter confirms the findings of a geophysical investigation performed by NORCAL Geophysical Consultants, Inc. on a portion of the subject property. The field survey was conducted on February 7, 2002 by Geophysicist Donald J. Kirker. Logistical support was provided by Mark Gomez of the City of Oakland.

I SITE DESCRIPTION AND PURPOSE

The survey area, as specified by Baseline, comprises approximately 5,600 square feet of the subject property, as shown on Plate 1. It is bound by a chain link fence to the north and east, and is open to the south and west. The survey area is covered with soil, and is free from above ground structures.

Historical information, provided by Baseline, indicates that this portion of the subject property was formerly occupied by a gas station. However, records are unclear as to the exact location of the station, and if the underground storage tanks (UST's) were removed when the service station was demolished. Therefore, the purpose of the geophysical investigation is to obtain subsurface information that will aid in determining if UST's exist within the designated limits of the survey area.

II METHODOLOGY

For this survey, we used the electromagnetic line locating (EMLL) and ground penetrating radar (GPR) methods. The EMLL method was used to detect shallow subsurface metal objects that may represent a UST. The GPR method was used to image variations in the electrical properties of the shallow subsurface. These variations can provide information on the location and dimensions of buried objects and fill boundaries. Descriptions of the EMLL and GPR methods are provided in Appendix A.

III DATA ACQUISITION AND ANALYSIS

Descriptions of data acquisition and analysis procedures for the GPR and EMLL methods are provided in Appendix A.

IV RESULTS

The results of the geophysical investigation are presented on the Geophysical Survey Map, Plate 1. This map shows the designated limits of the geophysical investigation, the locations of above ground features, and the locations of any detected subsurface features.

The EMLL investigation defined three areas with buried near surface metal and several utility alignments. The buried metal objects are located in the north half of the survey area, and are labeled A through C on Plate 1. Anomaly A measures approximately 4 by 4 feet. Anomalies B and C both measure approximately 3 by 2 feet. The 4 by 4 foot object (A) may represent a small UST or large utility vault. The 3 by 2 foot objects are not typical of a UST and may represent metal debris or a small utility vault. The utilities located at this site represent undifferentiated utility lines. These lines were primarily detected in the southeast quadrant of the survey area, as shown on Plate 1. Several of these utilities are truncated and end within the survey area. Others are continuous (shown with an arrow) and extend beyond the limits. No other buried metal objects or subsurface utilities were detected by the EMLL technique within the limits of the survey.

We obtained continuous GPR data along parallel traverses spaced five feet apart throughout the survey area. The GPR data obtained over Anomaly A indicates that the metal object is buried approximately one to two feet deep. However, the GPR data are not conclusive as to whether Anomaly A represents a UST. The GPR data obtained over Anomalies B and C are indicative of small objects buried approximately one to two feet deep. Over the remaining survey area, the GPR data defined five unknown features that we refer to as GPR Anomalies on Plate 1. Two of the anomalies comprise large zones that are located in the west central portion of the survey area. These zones are indicative of a change in fill and may represent former excavations associated with the removal of past UST's. The remaining three anomalies are isolated and probably represent small objects and debris. The GPR records also exhibit reflections that correspond with the EMLL detected utilities mentioned above.

V STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate having the opportunity to provide you with this information.

Respectfully,

NORCAL Geophysical Consultants, Inc.

Donald J. Kirker
Geophysicist, GP-997

DJK/jm

Enclosure: Plate 1
Appendix A GEOPHYSICAL METHODOLOGY, DATA ACQUISITION, ANALYSIS, AND LIMITATIONS

NORCAL

Appendix A

GEOPHYSICAL METHODOLOGY, DATA ACQUISITION, ANALYSIS, AND LIMITATIONS

NORCAL

Appendix A

GEOPHYSICAL METHODOLOGY

Electromagnetic Line Location (EMLL)

Electromagnetic line location techniques are used to locate the magnetic field resulting from an electric current flowing on a line. These magnetic fields can arise from currents already on the line (passive) or currents applied to a line with a transmitter (active). The most common passive signals are generated by live electric lines and re-radiated radio signals. Active signals can be introduced by connecting the transmitter to the line at accessible locations or by induction.

The detection of underground utilities is affected by the composition and construction of the line in question. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or in accessible utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that are not detectable using standard electromagnetic line location techniques include those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and pipes with insulated connections.

Buried objects can also be detected, without direct contact, by using the induction mode. This is used to detect buried near surface metal objects such as rebar, manhole covers, UST's, and various metallic debris. The induction mode is used by holding the transmitter-receiver unit above the ground and continuously scanning the surface. The unit utilizes two orthogonal coils that are separated by a specified distance. One of the coils transmits an electromagnetic signal (primary magnetic field) which in turn produces a secondary magnetic field about the subsurface metal object. Since the receiver coil is orthogonal to the transmitter coil, it is unaffected by the primary field. Therefore, the secondary magnetic fields produced by buried metal object will generate an audible response from the unit. The peak of this response indicates when the unit is directly over the metal object. Our instrumentation for this investigation consisted of a Fisher TW-6 inductive pipe and cable locator.

Ground Penetrating Radar (GPR)

Ground penetrating radar is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The method is particularly sensitive to variations in electrical conductivity and electrical permittivity (the ability of a material to hold a charge when an electrical field is applied).

The GPR system operates by radiating electromagnetic pulses into the ground from a transducer (antenna) as it is moved along a traverse. Since most earth materials are transparent to electromagnetic energy, the signal spreads downward into the subsurface. However, when the signal encounters a variation in electrical permittivity, a portion of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, all of the incident energy is reflected. The reflected signals are received by the same transducer and are printed in cross-section form on a graphical recorder. Changes in subsurface reflection character on the GPR records can provide information regarding the location of UST's, sumps, buried debris, underground utilities, and variations in the shallow stratigraphy.

For this investigation, we used a Geophysical Survey Systems, Inc. SIR-2 Subsurface Interface Radar System equipped with a 500 megahertz (MHz) transducer. This transducer is near the center of the available frequency range and is used to provide high resolution at shallow depths.

DATA ACQUISITION

Horizontal Control

We based site definition and data acquisition on a horizontal control grid. We used spray paint to mark the grid nodes on 10 by 10 foot centers. The limits of the geophysical survey area, as defined by the grid nodes, are shown on Plate 1. The specific locations of the grid nodes are not shown.

Geophysical Survey

GPR data were obtained along both north-south and east-west trending traverses spaced five feet apart throughout the survey area. The traverses ranged in length from 70 to 80 feet. The EMLL technique was scanned over these same traverses.

DATA ANALYSIS

We examined the GPR records for patterns characteristic of UST's. We also reviewed the records for changes in reflection patterns that could indicate variations in fill material associated with UST excavations or imported fill.

The EMLL instrumentation indicates the presence of buried metal by emitting an audible tone. There are no recorded data to analyze. The locations of buried objects detected with the EMLL method were marked on the ground surface with pink marking paint.

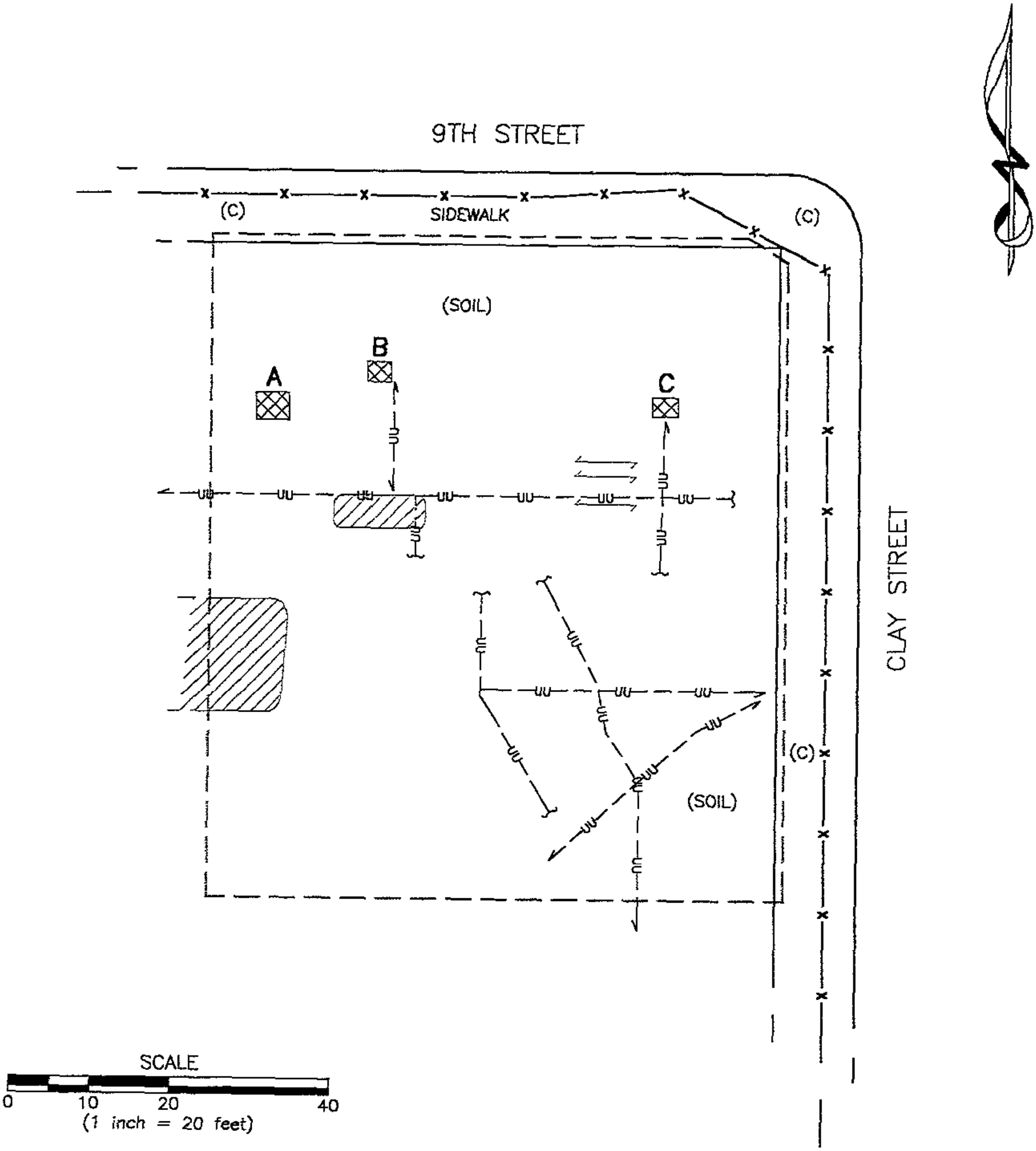
LIMITATIONS

GPR Technique

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Typically, the GPR depth of detection will be reduced as the clay and/or moisture content in the subsurface increases. Therefore, it is possible that targets (UST's and utilities), buried greater than 2 to about 4 feet, may not be detectable by the GPR technique.

EMLL Metal Detection Techniques

The detection of buried metal objects is dependent upon the size of the object, its depth of burial, and its proximity to above ground metal objects. As the size of the buried object decreases, the depth at which it can be detected also decreases. For example, a relatively large object such as a underground storage tank can be detected at depths of three to four feet. However, a smaller object, such as a metal vault lid, may only be detected at depths of 1 to 2 feet. In addition, the ability to detect a buried metal object is based on its proximity to above ground metal. Cultural features such as chain link fences, buildings, debris, railroad spurs, utilities, etc. may produce a response that can mask effects from the buried object.



LEGEND

— — — —	LIMITS OF GEOPHYSICAL SURVEY
OR	GPR ANOMALY
⊠	EMLL ANOMALY REPRESENTING BURIED METAL OBJECTS
—UU—	UNDIFFERENTIATED UTILITY LINE
—x—	CHAIN LINK FENCE
(C)	CONCRETE

NORCAL	GEOPHYSICAL SURVEY MAP VACANT LOT 9TH AND CLAY STREETS	
	LOCATION: OAKLAND, CALIFORNIA	
	CLIENT: BASELINE	PLATE
JOB # 02-202.34	NORCAL GEOPHYSICAL CONSULTANTS, INC	1
DATE: FEB 2002	DRAWN BY: G RANDALL / APPROVED BY: DJK	