



ORO LOMA SANITARY DISTRICT

August 30, 2007

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Alameda County
Environmental Health

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GENERAL MANAGER

Michael C. Cameron

Mr. Steven Plunkett
Alameda County Health Care Services
Environmental Protection Division
1131 Harbor Bay Parkway, Suite 250
Alameda, CA, 94502-6577

**SUBJECT: Transmittal Interim Corrective Action Plan
Fuel Leak Case RO0000288: 2655 Grant Avenue, San Lorenzo, CA**

Dear Mr. Plunkett:

We attach herewith our Interim Corrective Action Plan (ICAP) that was requested in your letter dated May 2, 2007, which has been prepared by our engineering consultants, The Sutton Group. The attached document presents the proposed interim corrective action program that is based on the technical data presented in the Initial Response dated March 30, 2007.

The consultants' plan comprises the combination of bulk excavation of soil in the area of the former tank, and collection of gasoline tainted groundwater from recovery trenches for treatment in the District's adjacent POTW. As was presented in the initial response letter, the system's cost-effectiveness is due to the District's capability for absorption of the 20gpm of gasoline-tainted water recovered from the gravel trenches into the influent stream into our 20 million gallons/day (14,000 gpm) treatment plant's recently-restored throughput. We ask that you review and accept this plan and then provide us a letter of acceptance of its concept for presentation to the California Underground Storage Tank Fund for cost reimbursement. Our next step will be to prepare construction-grade bid documents for public bidding. The successful bidder recommendation will be packaged for review to the State Fund for the reimbursement that our Board of Directors require in order for us to allow the CAP project to proceed.

The attached ICAP includes an implementation schedule for performing the excavation and construction phases followed by groundwater recovery and monitoring. The District is hopeful that this plan, the subsequent bidding effort, and State UST Fund approvals will be received so that excavation can commence in December 2007. The construction phase, expected to take a month or so, will be followed by collection and treatment of gasoline-tainted groundwater over a projected year to 18 months. Unless unforeseen upset conditions are indicated in the quarterly monitoring reports, the District looks forward to working with the Agency and closing this groundwater release case at the end of that

period, forecast to be in mid to late 2009.

As the authorized representative of the Oro Loma Sanitary District I declare, under penalty of perjury, that the information and recommendations contained in this and the attached document are true and correct to the best of my knowledge.

The District thanks the Agency for its forbearance in the later-than-requested submittal, brought upon by change in our engineering management staff. I commenced in my position as District Engineer on August 8. I look forward to meeting you in the near future and to working with you to bring this case to closure.

Please continue to directly contact our consultant, John Sutton, PE, in regard to technical aspects of this closure process. However, do not hesitate to contact me (email: jwarner@oroloma.org, or phone: (510) 489-6965 regarding this effort.

Respectfully submitted



Jason Warner, PE
District Engineer

Attachment: Interim Corrective Action Plan

cc: Michael Cameron, General Manager
John Sutton PE, The Sutton Group

THE SUTTON GROUP

3708 Mount Diablo Blvd. Suite 215, Lafayette, California 94549

Phone 925 284-4208 FAX 925 871-3617

E-mail suttongeo@sbcglobal.net

August 28, 2007

Mr. Steven Plunkett
Alameda County Health Care Services
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: Interim Corrective Action Plan Case ID: RO0000288
Oro Loma Sanitary District UST Site
District Services Center
San Lorenzo, California

Dear Mr. Plunkett:

On behalf of the Oro Loma Sanitary District (District), The Sutton Group has prepared this Interim Corrective Action Plan (CAP) to address the soil and groundwater contamination resulting from the former gasoline underground storage tank (UST) at the District's facility located at 2655¹ Grant Avenue in San Lorenzo, California (Figure 1). The purpose of this interim CAP is to present the planned procedures to excavate source-area soil that may contain residual gasoline, begin the removal of gasoline-contaminated groundwater, and to collect empirical data to demonstrate that the groundwater plume has stabilized (i.e., not expanding). Following source removal and restoration of the parking lot, a groundwater recovery system, which will consist of a series of collector trenches and a pump well will be operated, monitored, and evaluated to provide the basis for a final CAP, if required. Because we expect relatively slow recovery rates due to the fine-grained soil, we anticipate that this interim recovery system will operate for at least 18 months before the need for a final CAP can be evaluated.

1 SITE BACKGROUND AND CONDITIONS

A 1,000-gallon UST was installed for gasoline storage in 1961. Inventory control showed this original tank to be leaking and it was replaced in 1978 with a similar volume UST that was installed in the same location. There are few records of the original UST replacement but long-time employees reported that it was performed under the observation of the (then) San Lorenzo Fire Protection District's fire marshal, now with the successor Alameda County Fire Department. The 1,000-gallon UST installed in 1978 was used to store leaded gasoline until 1985 when it was converted to store unleaded gasoline. The UST remained in use until it was removed in May 1995. No leakage was observed with this UST.

Several subsurface investigations have been completed to characterize and delineate the vertical and horizontal extent of soil contamination and the groundwater plume. The first was in 1993 and the latest was in 2004. Five groundwater monitoring wells have been installed to monitor the plume,

¹ Until early 2007, the address "2600 Grant Avenue" was shared by the both the District's sewage treatment plant and its office building complex. To assist mail and goods deliveries the office building complex, which includes the area of the tank site, was renumbered as 2655 Grant Avenue.

three in the office complex parking lot, downgradient of the former tank location, and two more in Grant Avenue, also in the downgradient direction from the former tank location. Since the two wells in Grant Avenue were installed in early 1999, no contamination has ever been detected in them.

The most recent boring program was conducted subsequent to Agency's letter dated January 2, 2004. With authorization of this firm's work plan dated April 5, 2004, the boring program was conducted in spring 2004 to delineate the vertical limits of contamination, as well as to collect geochemical data about the site for a remedial design. This most recent boring program confirmed that no significant soil contamination by gasoline constituents extends deeper than eight feet below the ground surface. Using an interface probe, the investigations also confirmed the absence of free product in the groundwater monitoring wells. Further, as had been indicated from past explorations and confirmed by continuous core samplings in the three borings drilled in 2004, the majority of contamination passes through the site via relatively few and thin sand layers (½ to 3-feet thick) that are sandwiched between fat clay (Younger Bay Mud) layers, and in "smear zones" above and below the sands. As indicated on Figure 1, the site is in an industrial area approximately a quarter mile (downgradient) from any current and potential residential development. The asphalt paved site is also well buffered from public access. Adjoining and downgradient of the site, is the District's Publicly Operated (sewage) Treatment Works (POTW) facility.

Field tests on grab ground water samples in 2004 quantified dissolved oxygen, salinity (conductivity), temperature, pH and oxidation reduction potential (ORP). Field geochemical data and laboratory testing also quantified the presence of dissolved metals (iron and manganese), chemical oxygen demand (COD) and biological oxygen demand (BOD) and also the "Oxy-7" oxygenates, as well as gasoline/BTEX/MTBE in soil and groundwater.

Figure 2 is a site plan which shows the locations of all borings, exploratory test pits, and the five existing groundwater monitoring wells.

2 SCOPE OF WORK

2.1 Introduction

The point source of the dissolved gasoline, the former UST, along with additional nearby soil was removed in 1995. Well monitoring of the gasoline-contaminated groundwater plume suggests that it does not appear to be expanding except in the southwesterly direction. The scope of work presented describes planned procedures to excavate soil from the former UST area and the installation of three extraction trenches to recover contaminated groundwater from the onsite plume area (Figure 3).

The five groundwater monitoring wells (MW1 through MW5) at the site are routinely monitored and the results reported to the Alameda County Environmental Health Department (Agency). The groundwater monitoring program will continue as the Interim CAP is implemented. One well, MW4, is located within the planned soil excavation area and will be properly removed (technically abandoned) before excavation begins. A new well, to be designated MW6, will later be installed just downgradient (within ten feet) of the source-removal zone following completion of earthwork activities.

2.2 Monitoring Well MW4 Removal

As shown on Figures 2 and 3, monitoring well MW4 is located within the planned soil excavation area. Although this area will be excavated, the bottom of the excavation will likely not extend to the total depth of the well. Therefore, a C57-licensed driller with hazardous waste operations certification will remove the well by over-drilling the PVC well casing to its documented total depth to inhibit future vertical migration of groundwater at that location. After the well casing and sand filter pack material has been removed, the shaft will be backfilled by tremie grouting with a neat cement grout. The surrounding soil will not be excavated until at least a week after grouting to allow the grout to set. The waste drilling spoils (pipe, soil and sand filter pack) generated during the well removal will be temporarily stored for disposal with the subsequently excavated soil.

2.3 Source Area Soil Excavation

The area to be excavated is shown on Figure 3. The excavation will be nominally eight feet deep, which was determined to be deeper than measured soil contamination in the 2004 "vertical extent" soil sampling program. The lateral bounds of the excavation have been developed based on several practical parameters. These include:

- (a) The designated area includes the "hottest" soil concentrations of benzene and gasoline contamination from past samplings.
- (b) The excavation boundaries have been adjusted to limit potential damage to the District's Maintenance and Engineering buildings during the work. As the site overlies saturated, low strength bay land (swamp) and Bay Mud deposits. With groundwater only four feet deep, the buildings will need to be protected from excavation-caused subsidence by temporary shoring.
- (c) The excavation boundary has been located to avoid, where possible, the main underground utilities that serve these buildings and to protect them during the work. As the shoring cost is a major part of the excavation cost, the shoring layout is a significant factor in cost control. For example, the excavation shape will need to be rectangular to simplify bracing, as the Bay Mud is not amenable to tieback or deadman anchors because of its low strength. We have chosen an excavation with 40x45 foot nominal dimensions. Some utilities will need to be temporarily re-routed and/or permanently replaced following the work but we understand that this will be cheaper than the added shoring cost for their avoidance.
- (d) While the Engineering Department building will remain in operation during the work, the parking lot will be lost to use because all of it will be needed for contractor staging, while temporary storage of contaminated soils will need to be on adjacent land of the POTW. The District and we are concerned for the effect of potential odors during the work. As such, excavation and soil handling activities will only occur in the evenings and/or at night. Winds, typically slight at night, and with the absence of sun volatilization and odor will be curtailed. Stockpiles and dump truck loads will be promptly covered. Backfilling of the pit will also occur closely behind the soil removal operations. Recovery trench excavations will be done "under slurry" so volatilization will be minimal there (details below). As landfills are not open for waste acceptance during night hours, loaded trucks will need to wait until morning for unloading.

- (e) The parking lot also is the access to the District's maintenance facility which serves the District's wastewater collection system staff. As the soil excavation project will eliminate access to their supplies, equipment shops and servicing bays, the entire department and its equipment will need to be relocated to temporary quarters during the work period.

To protect the infrastructure, the edges of the excavation have been nominally set at eight feet from the building faces on the north and east sides, and five feet from the sanitary sewer trench from the Maintenance Building to Grant Avenue on the west side. The contractor will be required to shore the excavation, which will be designed by, and installed under the oversight of a California-licensed Civil Engineer with documented experience in the design and construction of similar installations under similar site conditions. As well as shoring and protection of utilities the eight-foot deep excavation will entail:

1. Removal of asphalt and delivery to a recycler;
2. Selective excavation of the approximately three feet thickness of crushed aggregate fill, with segregation of non-contaminated material and storage onsite for re-use as backfill, and offsite disposal of the odoriferous portion as contaminated soil;
3. Removal of contaminated soil to trucks and/or bins for offhaul to an appropriately licensed waste management facility;
4. Backfilling of the excavation with crushed stone aggregate;
5. Removal of the shoring;
6. Completion of the backfilling with aggregate base rock;
7. Installation of the recovery trenches (see below); and
8. Eventual repaving and re-striping of the parking lot.

2.4 Groundwater Recovery Trenches

Three groundwater collection trenches will be constructed in the parking area. Figure 3 provides a preliminary layout of the trenches. These locations will be finally established in the field after all utilities have been located. Due to the instability of the ground, the trenches will be excavated by the slurry trench technique using biodegradable polymer mud slurry. Slurry and water disposal, after soil solids separation, will be to the POTW.

The depth of the collection trenches will be approximately nine feet below the ground surface. Pipes will be installed in the slurry-filled trenches as they are backfilled. The trenches will be backfilled with about five feet of coarse aggregate drain rock such that the drain rock intercepts the peat and/or sand layers. The highly permeable rock backfill will parallel the alignment of the sand beds allowing the contaminated groundwater to enter the trench at a more consistent removal rate than would wells, the majority of which would be completed in the native fine-grained sediments. The drain rock backfill will be separated from the fine bayland soil materials by a non-woven geotextile fabric such as Mirafi® 140NC™. Details are provided on Figure 4.

At the downgradient end of the perforated horizontal pipe, an 8-inch diameter non-perforated standpipe will be installed vertically in each trench with the pipe extended down to approximately 12 feet depth and capped as a sump to improve pumping efficiency. At the upslope end of the perforated drain pipe, a 4-inch diameter riser pipe will be brought to the surface for sounding and flushing. A flush surface-mounted Christie box located at the upgradient end of the trench to provide well access and protection. The observation wells will allow access for periodic groundwater sampling, and system flushing, should that be determined necessary.

In addition, a three-inch diameter perforated, Class SDR35, PVC pipe will be placed horizontally for the full length of each trench at an approximate depth of three feet (in the vadose zone). The three-inch pipe size is to distinguish it from the four-inch recovery piping. This three-inch piping will also be extended up to the surface in the same Christie box. This piping will provide future remedial alternatives and is intended to be used only if it is later determined that contaminant removal could be enhanced by, for example, a soil vapor extraction effort, injection of an oxygen release compound, or other system may be appropriate based upon subsequent data generated from the groundwater extraction effort. Its incremental cost will be insignificant as compared to trenching cost.

An intrinsically safe electric extraction pump will be installed in each well to recover the groundwater from the trench. The extracted water from each of the three recovery trenches will be to conveyance to the sanitary sewer, as discussed below.

The upper portion of the trench over the drainage media will be backfilled with Caltrans Class 2 aggregate base (AB) and the asphalt paving restored with that of the bulk excavation. Cross sections of a typical extraction trench and the pump well and riser details are provided on Figure 4.

2.5 Groundwater Level Monitoring

Groundwater levels will be measured at the initiation of this remediation program. These data along with the historical data will be used as baseline values.

Groundwater elevations will also be measured in monitoring wells MW-1, MW-2, MW-3, and MW-5, as well as in selected observation wells installed in the recovery trenches, on a quarterly (once every 3 months) basis. (Monitoring well MW-4 will have been removed and not available for monitoring. These data will be used to evaluate the groundwater elevations. The groundwater elevation data will also be used to calculate the local hydraulic gradient.

Groundwater levels will be measured using an electronic, down-hole water level indicator. Free-phase product thickness, if present (none has been detected to date), will be measured using an electronic oil/water interface probe. Water level measurements will be reported to an accuracy of 0.01-foot compared to well-head elevations surveyed in early 2007.

2.6 Groundwater Recovery from Collection Trenches

The purpose of the collection trenches as part of the interim CAP is to provide groundwater extraction from the gasoline plume from a broader area than can be obtained using individual extraction wells. The use of collector trenches will enhance groundwater recovery and expedite groundwater remediation. Also, because the residual gasoline most likely resides primarily within thin, discontinuous peat and/or sand layers, trenches provide an infinitely larger contact interface area (i.e. the trench walls) of the peat and/or sand layers than individual extraction wells and should be a more

efficient recovery approach. The recovery data collected during the interim CAP period will allow for an evaluation of whether additional trenches would provide a more cost effective, long-term correction action approach.

The optimum extraction rates from the trenches and thus the appropriate pump sizes can only be determined after the trenches are in operation. Based on our experience, recovery rates in trenches are not well predicted by tests conducted in monitoring wells. We therefore propose to perform trench yield tests (using temporary test pumps) after the collector trenches are installed and from these, we will size the permanent pumps.

The groundwater recovered from the collection trenches will be conveyed to the District's existing sanitary sewer line flowing into the District's adjacent POTW facility. Each pump's plumbing will have a flow meter so that the recovery efficiency of each sector can be monitored. Check valves will also be provided to protect the sectors from backflows. The conveyance piping will be installed in shallow trenches connecting the collection trenches. These conveyance pipe trenches will be approximately three feet deep, or as appropriate for the District to connect to their sewer system.

The conveyance piping will be sized such that the pipes will be capable of handling a substantially larger volume of water than anticipated. Because of the predominantly fine-grained nature of the native soil, we anticipate that the optimum sustainable flow rate from each trench will be less than 20 gallons per minute and may only be a fraction of this rate.

2.7 Groundwater Treatment

Because the District's current wastewater treatment system can effectively treat the gasoline-tainted, groundwater extracted, the groundwater will be discharged from the collection trenches directly into one of the District's influent sewers. In-line flow meters will be used to measure the volume of extracted groundwater that is being discharged to the sanitary sewer. Quarterly water samples will be analyzed for gasoline as described above. Using the measured flow rate and the average concentration of gasoline dissolved in the groundwater, the mass of contaminant removed will be calculated and reported to the plant as well as the Agency on a quarterly basis.

2.8 Reporting

Status reports will be prepared and electronically submitted to the Agency database as is currently being done and to the State Water Resources Control Board's Geotracker database on a quarterly basis for the 18 months of this monitoring program. The fourth monitoring report will provide a summary of the previous year's activities and will present recommended modifications, if needed, to the monitoring program based on empirical data collected and analyzed. The quarterly monitoring reports will include all monitoring data presented in tabular format, a summary of the free-phase product volume removed, if any, and a groundwater gradient map.

3 IMPLEMENTATION SCHEDULE

Task 1	Removal/Abandonment of Monitoring Well MW-4	Week 1, or in advance of the
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	Task also includes re-routing of the District's fiber optic line around the trench.	construction project.
Task 2.	Excavate Source Area Soil Includes shoring installation, excavation, including segregation of reusable/disposable materials, backfilling, offhaul of wastes, and shoring extraction	Weeks 1 and 2
Task 3.	Installation of Collection Trenches Includes trench excavation, pipe-laying, backfilling, parking lot re-paving, and soil off-haul. Also includes electrical leaders for well pumps.	Week 2
Task 4.	Asphalt Re-Paving Repave entire parking lot, and re-striping	Week 3
Task 5.	System Startup Includes electrical hookup, pump installation, cleanup.	Weeks 3 and 4



4 APPROVAL

For the purpose of the California Underground Storage Tank Cleanup Fund reimbursement requirements, the District requests a letter from the Agency approving this plan and directing the District to implement this interim CAP.

Thank you for your time and review of this project. If you have any questions or need additional information regarding this interim CAP, please contact me at (925) 284-4208. If needed, we are available to meet with you to discuss this proposed interim CAP.

Very truly yours,

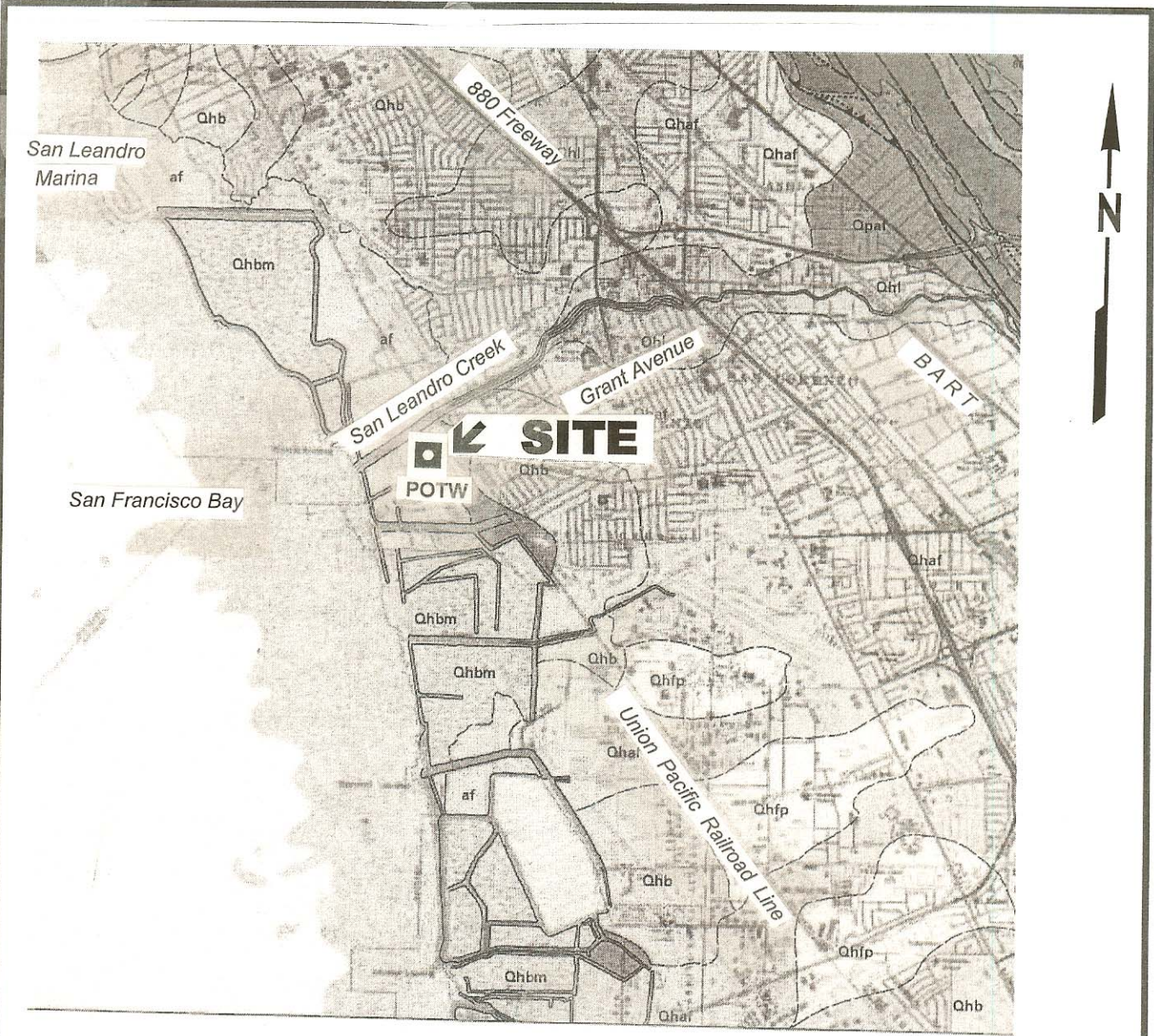
THE SUTTON GROUP



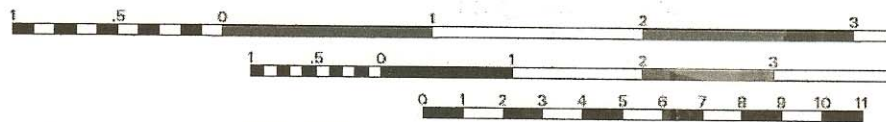
John R. Sutton, P.E.
Principal Engineer

Attachments: Figure 1 – Site location map with geology
Figure 2 – Site plan showing exploratory borings, trenches and wells
Figure 3 – Site plan showing proposed bulk excavation areas and locations of
groundwater recovery trenches.
Figure 4 Recovery trench and well details

cc: Mr. Michael Cameron, Oro Loma Sanitary District
Timothy Becker, Environmental Guidance, Inc.



Scale: 1 in. to 5,000 ft.



Kilometers

Miles

Thousand Feet

LEGEND

- af Artificial Fill (Historic)
- Qhaf Alluvial fan and fluvial deposits (Holocene)
- Qhb Basin deposits (Holocene)
- Qhbm Bay Mud (Holocene)
- Qhl Natural levee deposits (Holocene)

Source:

Graymer, RC, 2000: "Geologic map and map and database of the Oakland metropolitan area, Alameda, Contra Costa and San Francisco Counties, California", US Geological Survey, MF2432, version 1.0.

THE SUTTON GROUP
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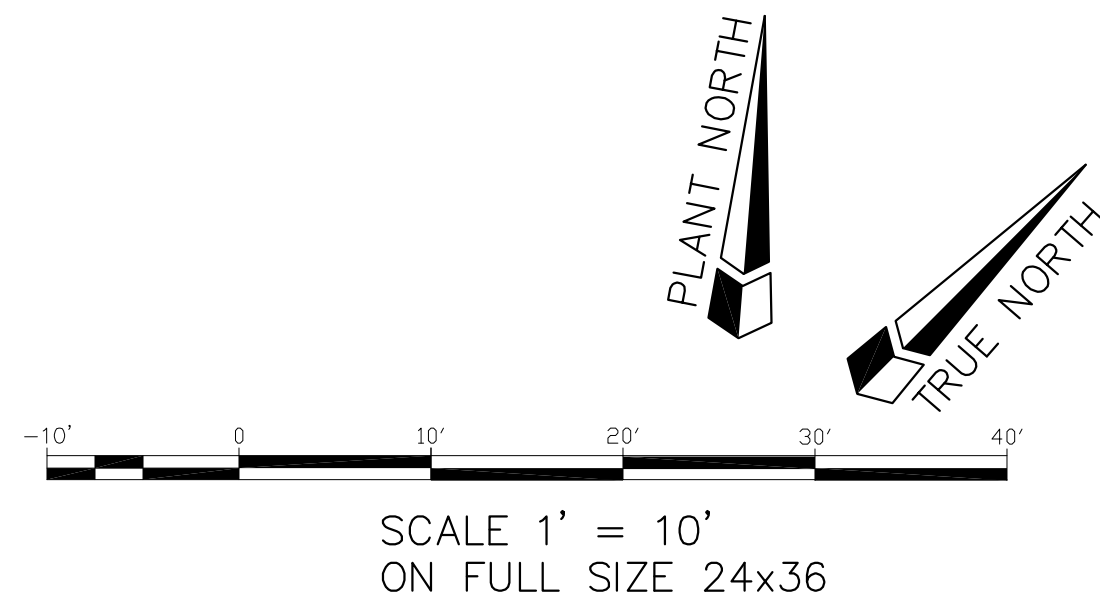
REGIONAL GEOLOGIC MAP

Oro Loma Sanitary District
San Lorenzo, CA

PROJECT No. 3022.12

FIGURE

1 4/5/07



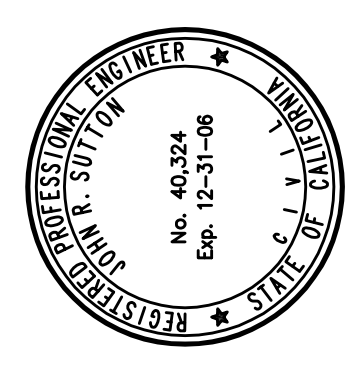
LEGEND

- SOIL BORING, LEVINE-FRICKE, 1993
- TEST TRENCH, SUTTON GROUP, 1994
- SOIL SAMPLE TANK REMOVAL, SUTTON GROUP, 1995
- ▲ GEOTECH, SOIL BORING, SUTTON GROUP, 1995
- ⊙ SOIL AND WATER INVESTIGATION, SUTTON GROUP, 1996
- ⊗ BORING LOCATION, SUTTON GROUP, 1998
- △ AIR SAMPLE LOCATION, SUTTON GROUP, 1998
- ▽ BORING LOCATION, SUTTON GROUP, 2004
- MW-1 MONITORING WELLS
- PP = POWER POLE
- CB = CATCH BASIN
- (E) = EXISTING
- (N) = NEW (THIS PROJECT)
- E — = ELECTRICAL LINE (E)
- EFO — = ELECTRICAL + FIBEROPTIC LINE
- D — = DRAIN LINE (E)
- SS — = SAN SEWER LINE (E)



REV	DESCRIPTION	DATE

THE SUTTON GROUP
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 925 284-4208 FAX 925 284-4189



ORO LOMA SANITARY DISTRICT
 2600 GRANT AVENUE
 SAN LORENZO, CALIFORNIA

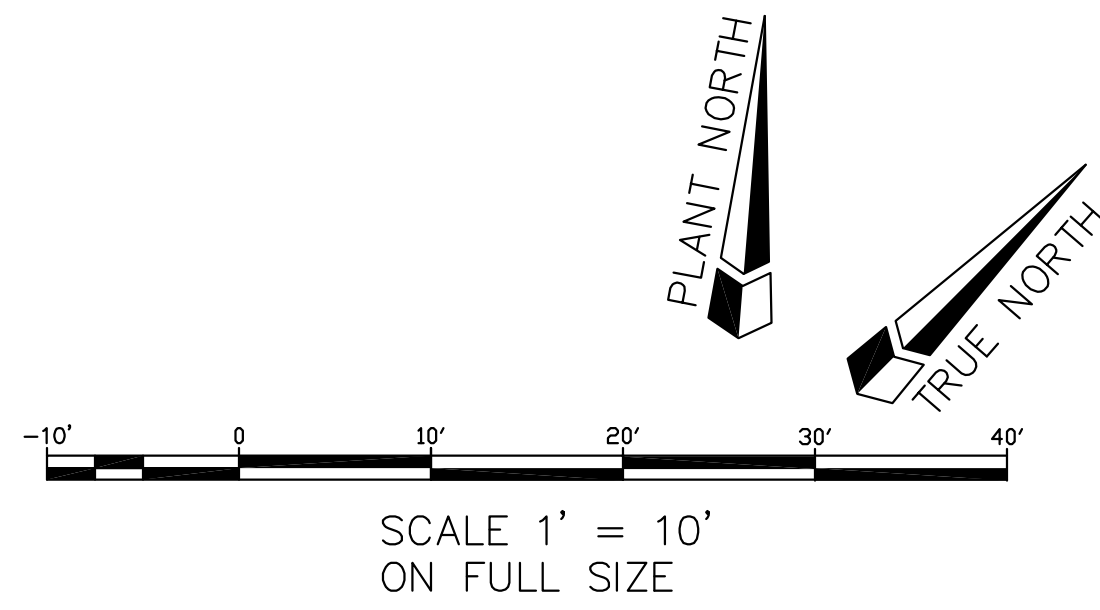
EXISTING CONDITIONS

JOB NO:
3022.12

DATE:
8-30-07

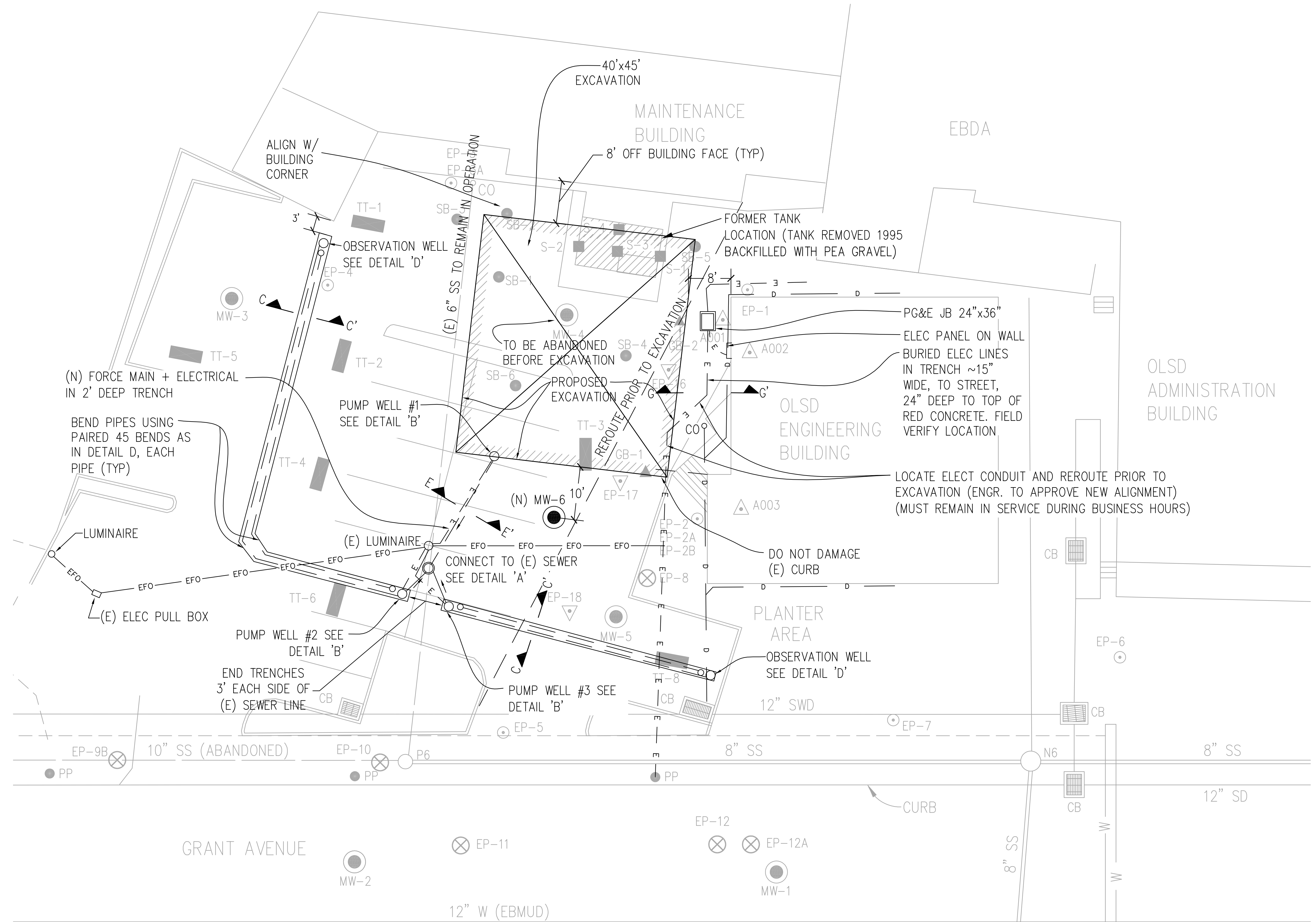
FIGURE

2



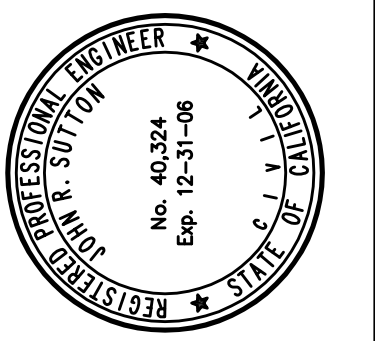
LEGEND

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REV	DESCRIPTION	DATE

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ORO LOMA SANITARY DISTRICT
 2600 GRANT AVENUE
 SAN LORENZO, CALIFORNIA

GASOLINE TANK AREA SITE PLAN REMEDIATION

JOB NO:
3022.12

DATE:
8-30-07

FIGURE

3

