Alameda-Contra Costa Transit District

December 10, 2012

Mr. Ralph Lambert
San Francisco Bay
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Lambert:

Subject: Investigation Work Plan for AC Transit Facility, 1100 Seminary Ave., Oakland

AC Transit hereby submits the enclosed Investigation Work Plan for the AC Transit facility located at 1100 Seminary Avenue in Oakland. The work plan, prepared by Cameron-Cole, was prepared in accordance with the directives set forth in your October 10, 2012, letter to identify all source areas, define the extent of contamination, and to determine if there is a potential exposure risk to residents of the adjacent properties.

The work plan contains the objectives, details and rationale for sample locations, sample depths, sampling methods, sample analysis and the schedule for the proposed work. The field investigation will consist of performing a ground penetration radar (GPR) survey, drilling eleven soil borings and drilling three soil gas borings. The purpose of the GPR survey is to determine the location and boundaries of the excavation from the underground storage tanks that were removed in 1986/87. Soil gas samples will be analyzed for benzene using USEPA Method TO-15. Soil and grab groundwater samples will be analyzed for total petroleum hydrocarbons as diesel using USEPA Method 8015 modified and for gasoline, naphthalene, benzene, toluene, ethyl benzene, xylene (BTEX) by USEPA Method 8260. Groundwater samples collected from monitoring well MW-2 using the passive diffusion bag samplers will be analyzed for gasoline, naphthalene and BTEX.

Upon receiving your agency's approval of the work plan, AC Transit will proceed with an informal solicitation to retain a qualified vendor to implement the work plan. If you have any questions or comments regarding the enclosed work plan, please call me at (510) 577-8869.

Sincerely,

Suzanne Chaewsky

Suzanne Chaewsky, P.E.
Manager, Safety and Environmental Engineering

cc: Mark Detterman, Alameda County Environmental Health

Enclosure

10626 International Blvd., Oakland, CA 94603 • (510) 577-8869 • schaewsk@actransit.org

INVESTIGATION WORK PLAN
FOR AC TRANSIT'S D4 FACILITY
1100 SEMINARY AVENUE, OAKLAND CALIFORNIA
SFRWQCB No. 01-2348

Prepared For:

AC TRANSIT

10626 E. 14th Street
Oakland, California 94603

Prepared By:

Cameron-Cole

50 Hegenberger Loop
Oakland, California 94621

December 2012

INVESTIGATION WORK PLAN
FOR AC TRANSIT'S D4 FACILITY
1100 SEMINARY AVENUE, OAKLAND CALIFORNIA
SFRWQCB No. 01-2348

Prepared For:

Ms. Suzanne Chaewsky
AC Transit-Environmental
10626 E. 14th Street
Oakland, California 94603

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December 2012

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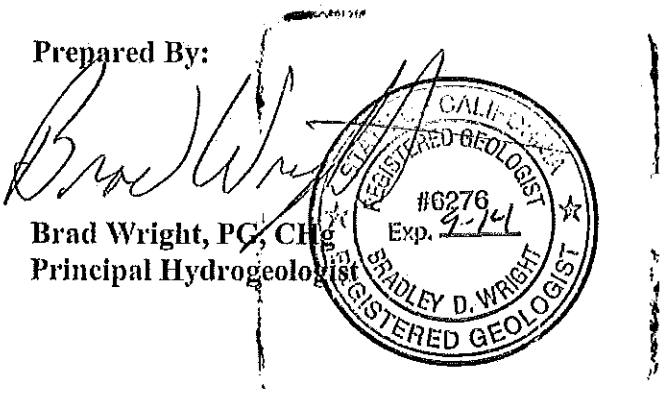

Brad Wright, PG, CHg
Principal Hydrogeologist

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1. INTRODUCTION

In a letter dated October 10, 2012, the San Francisco Bay Regional Water Quality Control Board (the Board) issued a requirement for AC Transit to prepare an investigation work plan for the D4 facility located at 1100 Seminary Avenue in Oakland, California (the Site). The letter requires that the work plan contain objectives, details and the rationale for sample locations focusing on two concerns that the Board has regarding previous subsurface investigation work conducted at the Site.

The first area of concern is in the vicinity of the former underground storage tanks (USTs) that were removed in 1986 and 1987. The Board has requested that additional soil and groundwater samples be collected closer to the location of the former USTs to better define the concentration of residual diesel and gasoline which would be a secondary source to groundwater. Additionally, with concentrations of benzene detected in Site monitor wells, the Board is concerned with the potential for indoor vapor intrusion to nearby housing occupants.

The second concern that the Board stated in their letter is associated with monitor wells installed during previous Site investigations. Monitor well MW-2, which historically had a measureable free phase product layer, may have been screened across two distinct water-bearing horizons and may be providing a conduit for vertical migration. Monitor wells MW-4 and MW-5, which were probably destroyed in the late 1980s, were only sampled once with concentrations of TPH and benzene detected in both wells.

On behalf of AC Transit, Cameron-Cole LLC has prepared this work plan, which details a subsurface investigation designed to address the concerns of the Board. The work plan provides details on premobilization requirements, sample locations in the vicinity of the former USTs and monitor wells, sampling methodology, laboratory analysis, reporting and schedule. A Site location map is presented as Figure 1 and the Site facility layout with proposed soil boring locations is presented as Figure 2.

2. PREMOBILIZATION ACTIVITIES

After receiving Board approval of this work plan and prior to mobilizing equipment to the Site, the following activities will be performed:

- A site specific Health and Safety Plan will be prepared in accordance with California Occupational Health and Safety Administration requirements;
- The location of all borings will be marked with white paint and Underground Service Alert (USA) will be notified of impending activities. Additionally, a professional underground utility locator will clear each boring location;
- Schedule drilling contractors; and
- Drilling permits will be obtained from Alameda County Public Works Agency (ACPWA).

3. SCOPE OF WORK

Figure 2 shows the location of 11 soil borings and three soil gas borings to be installed during the investigation. Prior to finalizing the precise locations of the soil borings to be installed in the vicinity of the former USTs, a ground penetration radar (GPR) survey will be performed to see if the location of the former UST excavation can be determined.

3.1. Ground Penetration Radar Survey

As the USTs were removed in 1986 and 1987, there is some uncertainty associated with their precise location. To more accurately determine the location of the former UST excavation, a GPR survey will be conducted. GPR uses high-frequency radio waves transmitted into the ground which are reflected to receiving antenna detecting boundaries between different materials. If the backfill used for the UST excavation consisted of pea gravel or some other nonnative material it should be detected during the GPR survey. All detected boundaries will

be marked on the surface and if a pattern similar to the excavation is revealed, the excavation boundary will be used to establish the location of the proposed soil borings.

3.2. Soil Boring Locations

As shown of Figure 2, five soil borings will be located approximately 10 feet from the UST excavation. One boring is located on each end of the excavation and three borings are located along the downgradient edge of the excavation. Additionally, up to four more soil borings will be installed at distances further from the UST excavation to further define the extent of residual fuel which may be present in soil and groundwater. A low clearance covered storage area on Site limits access to drilling equipment upgradient of the UST excavation.

Laboratory analytical results from soil and groundwater samples collected from these borings will be used to define the concentration and extent of residual fuel in the vicinity of the UST excavation.

Two additional soil borings will be located in the areas of abandoned monitor wells MW-4 and MW-5. Laboratory analysis of samples collected from these borings will be used to determine if concentrations of TPH and benzene detected in these wells in 1987 are still present in soil and groundwater.

3.3. Soil Gas Boring Locations

As shown of Figure 2, three soil gas borings will be located along the Site property boundary and the nearest private residence located on 62nd Avenue. Laboratory analysis of soil gas samples from these borings will be used to determine if there is a potential for indoor vapor intrusion to the nearby housing.

3.4. Soil and Grab Groundwater Sampling

Soil borings will be installed using direct push drilling equipment. Each soil boring will be continuously cored within new polyethylene sleeves and described onsite by an experienced geologist in accordance with the Unified Soil Classification System. This includes a description of the soil type, texture, grain size, moisture content and Munsel color. Additional soil descriptions recorded in the field include evidence of chemical contamination including staining, discoloration and odor. A representative sample from each soil horizon will be screened with a photoionization detector (PID) to determine if volatile constituents are present in the soil core.

If evidence of soil contamination is recorded in the field, the identified soil interval will be selected for laboratory analysis. If no evidence of soil contamination is observed, one soil sample from the capillary fringe and one soil sample from the aquifer will be submitted for laboratory analysis. Laboratory soil sample preparation includes cutting the polyethylene sleeve for the interval to be submitted, capping each end of the sleeve with Teflon tape and tight fitting caps, assigning the sample interval a unique identification number, placing the sample in plastic bags and an ice filled color. The sample ID number, depth, time and date of collection and requested analysis will be entered onto chain-of-custody documentation.

Grab groundwater samples will be collected from the water table aquifer through temporary PVC casing installed in the borings. Grab groundwater samples will be collected with bailers or by pumping to the surface through small diameter tubing. The grab groundwater samples will be placed in laboratory supplied containers, assigned unique identification numbers, sealed in plastic bags and placed in an ice filled cooler. The sample ID number, depth, time and date of collection and requested analysis will be entered onto chain-of-custody documentation.

Based on the lithologic logs recorded during previous site investigations, it is assumed that the water table aquifer will be encountered at depths of approximately 10 though 15 feet below groundsurface. After the grab groundwater sample has been collected the temporary casing will be removed and the boring will be backfilled with neat cement pumped into the borehole from the bottom up.

Drill cuttings and fluids generated during soil boring installation will be contained in appropriately labeled containers, transported to the Site's waste storage facility and disposed of in accordance with applicable regulatory requirements.

3.5. Soil Gas Sampling

The location of the three soil gas borings are shown on Figure 2. The soil gas samples will be collected in accordance with the *Advisory-Active Soil Gas Investigations, DTSC, LA RWQCB, SF RWQCB* dated April 2012 (the Advisory). The soil gas wells will be installed using direct push drilling equipment and drive point methodology. At each sample location, direct push drilling equipment will be used to drive a 1-inch diameter steel sample probe casing to a depth of five feet. A ¼-inch outer diameter sampling tube will be inserted inside the probe casing for soil vapor sample collection. Hydrated bentonite will be used to seal around the drive rod at the ground surface to prevent ambient air intrusion. The inner soil gas pathway from probe tip to the surface will be continuously sealed (e.g., a sampling tube attached to a screw adapter fitted with an o-ring and connected to the probe tip) to prevent infiltration. In order to allow for subsurface conditions to equilibrate, the drive rod will remain in the ground for at least two hours prior to leak testing, purge volume testing and soil gas sampling.

Soil gas sampling will include adhering to the equilibration times and conducting the shut-in, leak and purge volume testing requirements specified in the Advisory. Soil gas sampling will be conducted using passivated stainless steel canisters and will follow the requirements of the Advisory for use of this sample container. Based on a review of boring logs generated during previous Site investigations, the alternative sampling method for low permeable soils (presented in Appendix D of the Advisory) may need to be implemented at the Site.

After sampling each soil gas well will be abandoned in accordance with ACPWA and the Advisory requirements.

3.6. Monitor Well MW-2 Stratified Groundwater Sampling

A review of the lithologic log from monitor well MW-2 indicates that the well is potentially screened across two water bearing horizons. A sandy gravel from 8 to 11 feet and a gravel to silty sand from 18 to 21 feet are separated by seven feet of silty clay. For purposes of assessing if concentrations of volatile fuel related constituents exist at significantly different concentrations at the two horizons, MW-2 will be sampled using passive diffusion bag (PDB) samplers. A PDB sampler is a low-density polyethylene bag filled with deionized water, which acts as a semi permeable membrane and is suspended in a well to passively collect groundwater samples. PDB samplers rely on the free movement of groundwater from the water bearing zone through the well screen. Volatile compounds in groundwater will diffuse across the bag material until constituent concentrations within the bag reach equilibrium with concentrations in the surrounding groundwater.

Two PDB samplers will be installed in MW-2 at depths corresponding to the two water bearing horizons. The PDB samplers will be placed in MW-2 a minimum of two weeks prior to sample collection to ensure that the deionized water in the diffusion bag has reached equilibrium with the surrounding groundwater. During sampling, water is transferred from the PDB sampler to standard laboratory supplied containers. After sample transfer, the containers are placed in an ice filled cooler and shipped to the analytical laboratory following chain-of-custody protocol.

3.7. Laboratory Analysis

Soil and grab groundwater samples collected during the investigation will be analyzed for TPH as diesel by USEPA Method 8015 modified and for gasoline, naphthalene, benzene,

toluene, ethylbenzene, xylene (BTEX) by USEPA Method 8260. Groundwater samples from MW-2 collected with the PDB samplers will be analyzed for gasoline, naphthalene and BTEX.

Soil gas samples will be analyzed for benzene by USEPA Method TO-15. Additionally, the soil gas sample analysis will include the liquid tracer compound used during leak testing. Trip blanks prepared and supplied by the analytical laboratory for both water and soil gas, will be onsite during sampling activities and will be shipped along with the samples back to the analytical laboratory for analysis.

4. REPORTING

Data collected during the subsurface investigation will be presented in a report to be submitted to the Board. The report will include a description of the field activities, a site map displaying the soil boring locations, GPR survey information and summary table of laboratory analytical results. The results of the investigation will update the known extent of the TPH in soil and groundwater. If warranted, recommendations for additional data collection or remedial options will be proposed. Copies of laboratory analytical reports and soil boring logs will be provided as appendicles. The report will be reviewed and stamped by a California professional geologist and submitted in electronic format to the Board's GeoTracker database.

5. SCHEDULE

The proposed field work will be scheduled to occur during the first quarter of 2013. The results of the investigation will be incorporated into the Site's First Quarter 2013 Groundwater Monitoring report.

FIGURES

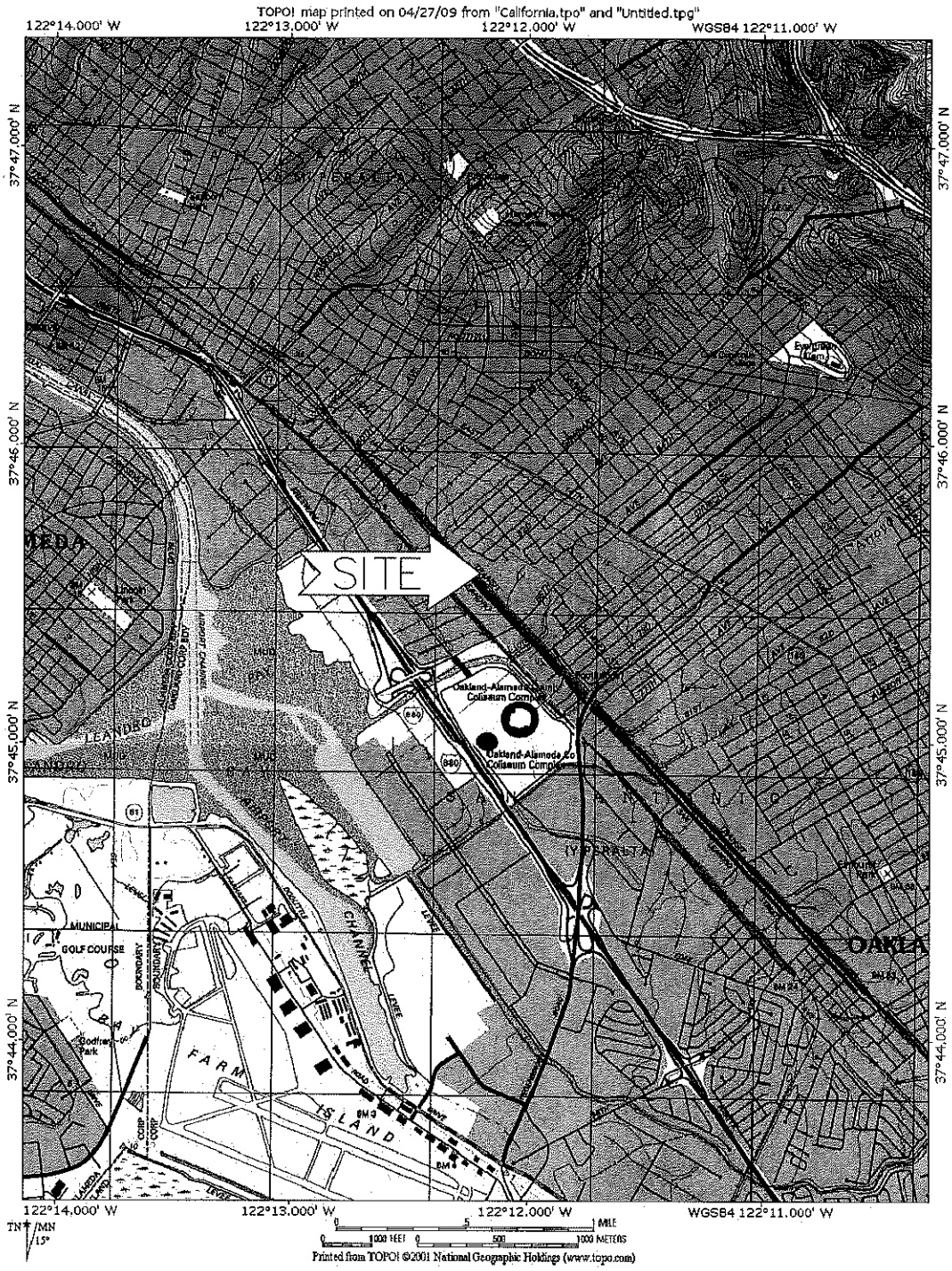

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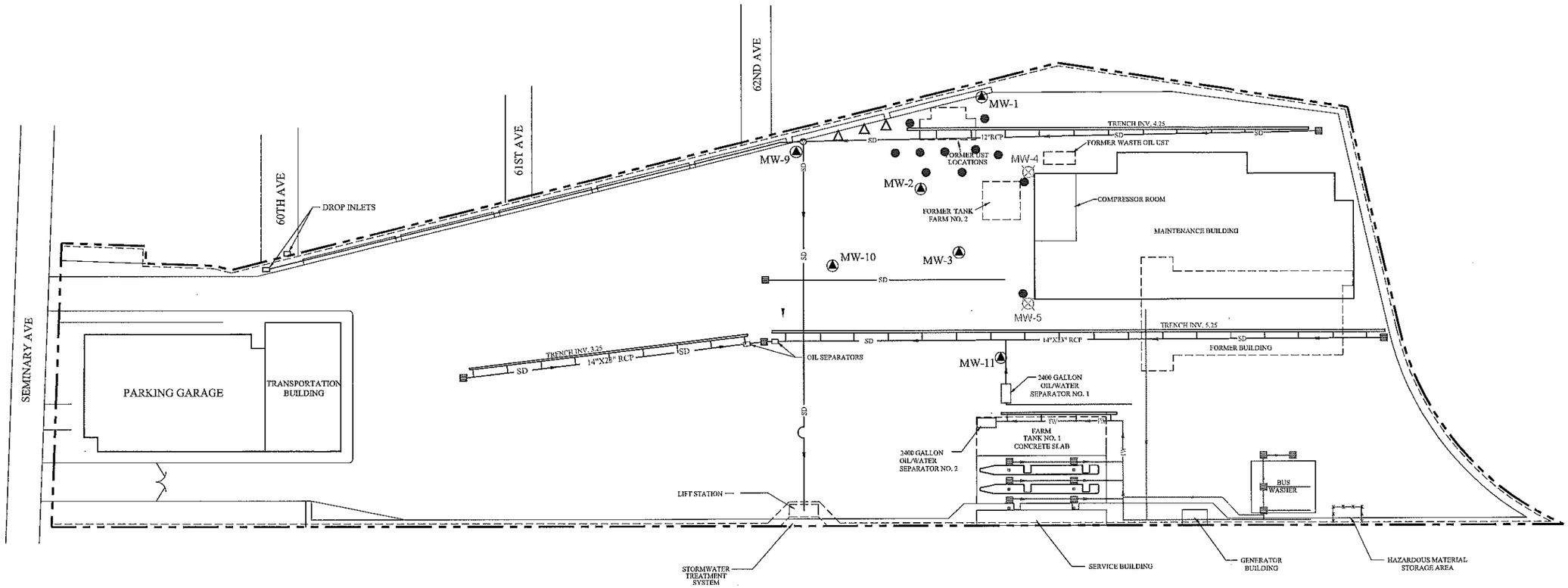
FIGURE 1

SITE LOCATION MAP
AC TRANSIT – SEMINARY
OAKLAND, CALIFORNIA

SCALE: AS NOTED

DATE: 4–28–09

2036–001A



LEGEND:

- PROPERTY BOUNDARY
- SOUNDWALL
- CATCH BASIN
- SD — STORM DRAIN
- SURFACE DRAIN TRENCH
- FW — INDUSTRIAL WASTE PIPELINE
- MONITORING WELL
- PROPOSED SOIL BORINGS
- PROPOSED SOIL GAS BORINGS
- ABANDONED MONITORING WELLS

0 120
FEET

	BY	DATE
DRAWN	AJW	12/10/12
CHECKED		
APPROVED		
APPROVED		
APPROVED		

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FIGURE 2
AC TRANSIT - OAKLAND, CALIFORNIA
1100 SEMINARY AVENUE
SITE PLAN

SCALE: 1" = 120'

DWG. NO.: PROPOSEDBORINGS1112