RIEDEL ENVIRONMENTAL
SERVICES INC.

California/Western Region:
4138 Lakeside Drive
Richmond, California 94806
(510) 222-7810
FAX: (510) 222-6868

1 March 1994

State of California Department of Transportation
Attn: Ms. Kathleen R. Pargett, P.E.
1121 7th Street, 2nd Floor
Oakland, California 94607

Subject: Work Plan - Monitoring Well Installation
505 Cedar Street, Oakland, California
RES Project No. 4043

Dear Ms. Pargett:

Riedel Environmental Services, Inc. is pleased to present this Work Plan for the Cal East site located at 505 Cedar Streets in Oakland, California. The scope of work includes advancing three soil borings to a depth of approximately 30 feet, installing a ground water monitoring well in each, and the collection of soil and ground water samples for laboratory analysis, and preparation of a report documenting the installation and sampling.

Guidance for the preparation of this Work Plan was drawn from the Tri-Regional Board Staff Recommendations For Preliminary Investigation And Evaluation Of Underground Tank Sites, dated August 1990, and Appendix A - Reports Tri-Regional Board Staff Recommendations For Preliminary Investigation And Evaluation Of Underground Tank Sites, dated August 1991.

If you have any questions, please contact Chris Merritt at (510) 222-7810.

Sincerely,

RIEDEL ENVIRONMENTAL SERVICES, INC.

CHRIS MERRITT

Chris Merritt
Geologist

Christopher B. White
Senior Geologist
R.G. 4983

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WORK PLAN FOR
MONITORING WELL INSTALLATION

CAL EAST SITE
505 CEDAR STREET
OAKLAND, CALIFORNIA

Prepared for:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
1121 7TH STREET, 2ND FLOOR
OAKLAND, CALIFORNIA 94607

Prepared by :

RIEDEL ENVIRONMENTAL SERVICES, INC.
4138 LAKESIDE DRIVE
RICHMOND, CALIFORNIA 94806
(510)222-7810
RES PROJECT NO. 4043

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MONITORING WELL INSTALLATION

CAL EAST SITE
505 CEDAR STREETS
OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This work plan presents the work to be conducted by Riedel Environmental Services, Inc. (RES) at the Cal East site located at 505 Cedar Streets in Oakland California (refer to Figure 1). The work plan has been developed for the installation of three ground water monitoring wells to determine whether the ground water in the area of a former underground storage tank (UST) pit has been impacted with residual petroleum hydrocarbons.

1.1 Site Background

On 17 and 18 November 1993, RES removed a 2,500 gallon UST from beneath the parking area at the subject site. Soil samples obtained from the bottom and sidewalls of the UST pit were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 5030/8015, total petroleum hydrocarbons as diesel (TPHd), benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Method 8020, and total lead by EPA Method 3050/6010. The results of the analysis indicated that residual petroleum hydrocarbons were present in the bottom and sidewalls of the UST pit.

On 23 November 1993, over-excavation of the UST pit was conducted in an effort to remove as much hydrocarbon impacted soil as possible. Upon completion of the over-excavation excavation confirmatory samples were obtained. The UST excavation was then backfilled with imported sand. The tank removal, over-excavation, and confirmatory sample analysis are documented in the tank removal report dated 21 January 1994.

1.2 Scope of Work

The scope of work for the monitoring well installations proposed by RES includes the following:

1) Prepare Work Plan

2) Prepare site specific Health and Safety Plan

3) Obtain necessary permits and submit required notifications

4) Locate underground utilities in boring locations

5) Cut concrete in boring/well locations — in backfill ?

6) Advance exploratory soil boring B-1 within the former UST location to a total depth of approximately 30 feet below grade and B-2 and B-3 approximately 10 feet to the west and south of the former tank pit to a depth of 25 feet. Collect soil samples at 5-foot depth intervals, and continuing to the soil-ground water interface and bottom of the boring. Screen soil samples with a photoionization detector (PID). Continue the boring to a depth of 15 feet below first encountered ground water or until 5 feet of competent clay aquitard is encountered.

7) Install a 4-inch diameter well casing (MW-1) in boring B-1. The 4 inch casing will allow for the future utilization of this as an extraction well if necessary. Install 2-inch diameter ground water monitoring wells (MW-2 and MW-3) in borings B2 and B3. Develop the wells using surge block and bailer methods and/or submersible pump. 72 hr. bet. well inst. + devel.

8) Obtain ground water samples from wells MW-1 through MW-3 using a teflon, polyethylene or stainless steel bailers after purging 4 well casing volumes of water.

10) Analyze ground water samples and selected soil samples for TPHg by EPA Method 5030/8015, Volatile organics by EPA Method 8240 with acetone, oil and grease by Standard Method 5520, and California Assessment Manual (CAM 17) metals by EPA methods 3050/6010/7471. BTEX 24 hr. before sampling.

11) Arrange for disposal of soil cuttings and purged ground water stored on-site in 55-gallon drums. good

12) Evaluate data and prepare a subsurface investigation report. ✓

2.0 PRELIMINARY ACTIVITIES

2.1 Health and Safety Plan

A site specific Health and Safety Plan describing the health and safety issues related to the drilling, well installation, and ground water sampling, and measures to be taken to safely conduct the work will be used.

2.2 Permits

RES will obtain well installation permits from the Zone 7 Alameda County Flood Control and Water Conservation District. An Encroachment Streets and Sidewalks permit from the Oakland Department of Public Works will be necessary if a boring is to be advanced through the street or sidewalk. At this time, the proposed boring locations are within the property limits.

2.3 Underground Utilities

RES will contact Underground Service Alert (USA) at least three days prior to commencing work. USA will contact companies with underground utilities in the vicinity of the borings. Utility companies will mark the locations of their respective lines. A site meeting will be requested between RES and the various utility companies if necessary. In addition, the boring locations will be electronically cleared by a utility locating company subcontracted by RES.

3.0 SUBSURFACE INVESTIGATION

3.1 Exploratory Soil Borings and Sampling

The proposed boring locations are shown in Figure 3. Boring B-1 will be located within the former UST excavation. The borings will be advanced by using a CME-55 truck-mounted hollow-stem auger drill rig. Soil samples will be obtained at 5-foot depth intervals, at the soil-ground water interface, and at the bottom of the boring according to the RES Standard Operating Procedure for soil sampling (included in Appendix A). Samples will be collected in 2 inch diameter by 6 inch long stainless liners. Borings B-1 through B-3 will be continued to a depth of 15 feet below first encountered ground water or until a 5 foot thick competent clay aquitard is encountered. Ground water was present in the former tank pit at a depth of approximately 10 feet below ground surface.

Soil cuttings from the borings will be stored on-site in 55-gallon drums pending laboratory analysis for proper disposal. A composite sample of the soil cuttings will be obtained for disposal profiling.

3.2 Ground Water Monitoring Well Installation and Development

Boring B-1 will be completed as a 4-inch diameter ground water monitoring well, MW-1. Borings B-2 and B-3 will be completed as 2-inch diameter monitoring wells MW-2 and MW-3. The well casing will consist of Schedule 40 PVC. The well screen will be 0.010-inch machined-slot and will extend a maximum of 15 feet below and 5 feet above the static ground water level, for a maximum screened interval of 20 feet. The filter pack of MW-1 will consist of # 2/12 (12 x 20 sieve size) Monterey sand extending 1 to 2 feet above top of screen and MW-2 and MW-3 will consist of # 2/16 (16 x 30 sieve size) Monterey sand extending 1 to 2 feet above top of screen. A 1 to 2 foot seal of hydrated bentonite will be placed above the filter pack, followed by a 5% bentonite/cement grout slurry. The well head will be protected with an 8-inch diameter traffic-rated vault box.

The wells will be developed using surge block and bailing methods and/or submersible pump until relatively silt and sand free water is obtained. Purged ground water will be stored on-site in 55-gallon drums pending laboratory analysis for proper disposal.

The RES Standard Operating Procedure for ground water monitoring well development and installation is included in Appendix A.

3.3 Ground Water Sampling

After at least 24 hours has elapsed from development, the monitoring wells will be purged of at least 4 well casing volumes of ground water and sampled using a teflon, polyethylene-disposable or stainless steel bailer. The RES Standard Operating Procedure for ground water sampling is included in Appendix A.

4.0 LABORATORY ANALYSES

4.1 Soil

how many ?

Soil samples will be screened during collection with a PID. Soil samples selected for laboratory analysis based on PID measurements will be refrigerated to 4° C and transported under chain of custody to a State of California certified testing laboratory. The samples will be analyzed for TPHg by EPA Method 5030/8015, BTEX and halogenated organics by EPA Method 8020, oil and grease by Standard Method 5520E&F and CAM 17 metals by EPA Method 3050/7471.

8240 ?

says 8240 on p. 2

4.2 Ground Water

Ground water samples will be refrigerated to 4° C and transported under chain of custody to a State of California certified testing laboratory. The samples will be analyzed for TPHg

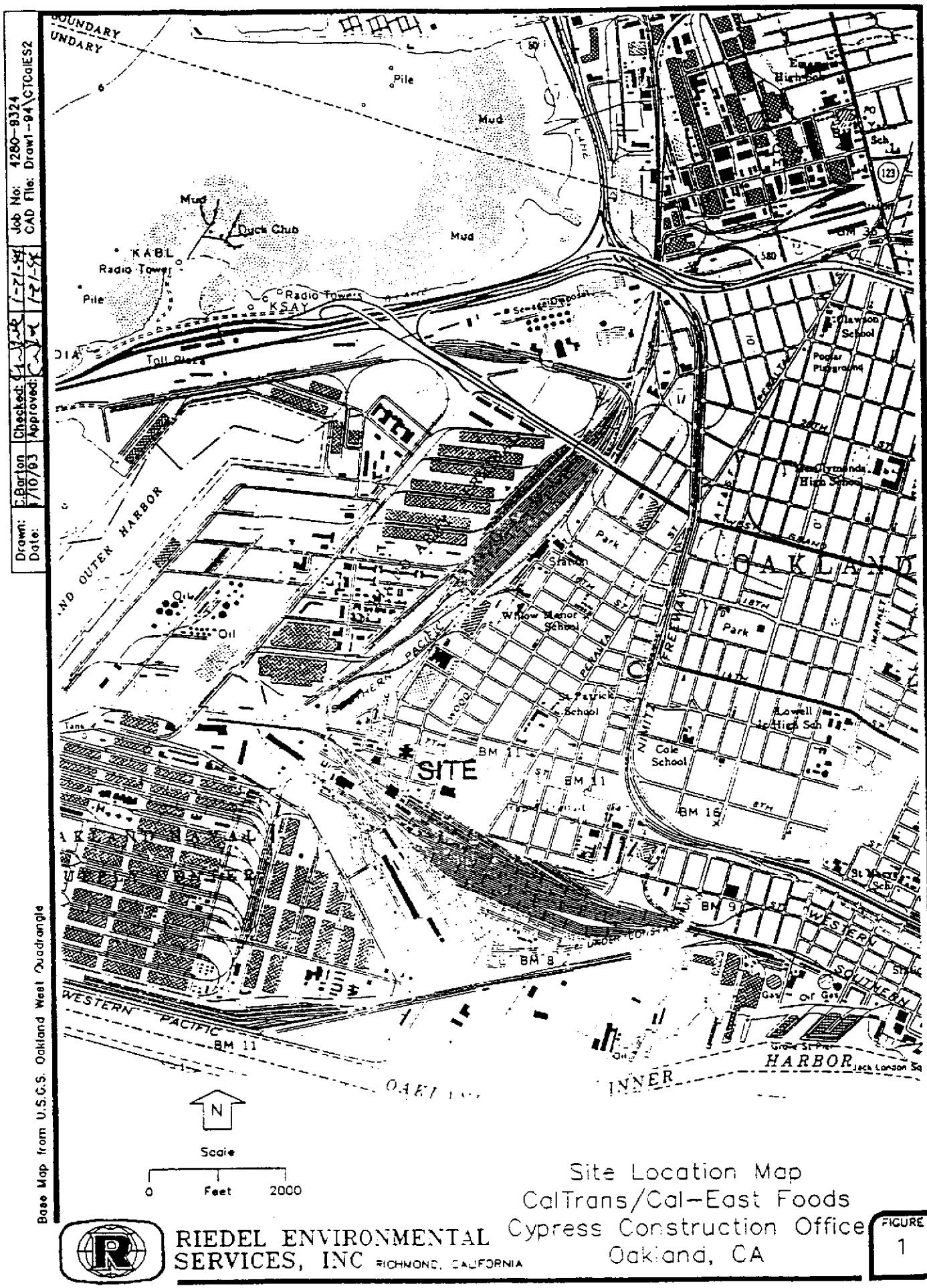
?

by EPA Method 5030/8015, TPHd by EPA Method 3510/8015, BTEX by EPA Method 601/602, oil and grease by Standard Method 5520B&F and CAM 17 metals by EPA Method 6010.

5.0 REPORT

A subsurface investigation report will be prepared documenting RES' activities and recommendations and containing potentiometric data and boring logs for the wells.

+ Submitted when ?



Site Location Map
CalTrans/Cal-East Foods
Cypress Construction Office
Oakland, CA

FIGURE 1

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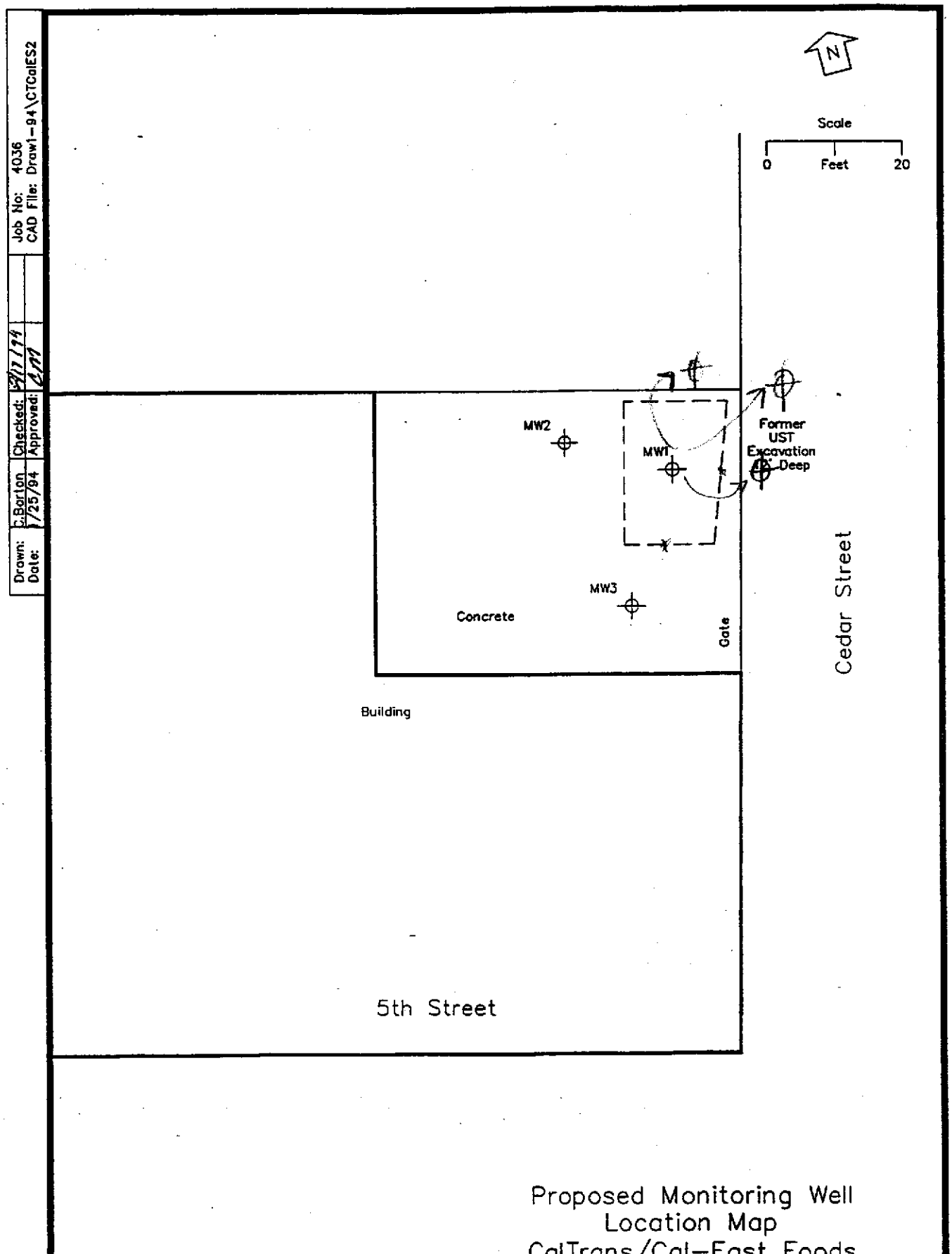

Proposed Monitoring Well Location Map
CalTrans/Cal-East Foods
Cypress Construction Office
Oakland, CA

RIEDEL ENVIRONMENTAL SERVICES, INC RICHMOND, CALIFORNIA

FIGURE 2

APPENDIX A

Standard Operating Procedures

STANDARD OPERATING PROCEDURE:
SOIL SAMPLING FROM BORINGS
HOLLOW-STEM AUGER METHOD

Soil samples for chemical analysis are collected in thin-walled brass tubes, 6-inches (in) long by 2-in or 2.5-in outside diameter (OD). Three of these tubes are set inside a 2-in or 2.5-in inside diameter (ID) 18-in long split-barrel sampler.

The split-barrel sampler is lowered to the bottom of the hollow stem auger string and driven its entire length either hydraulically or using a 140-pound drop hammer. Thus, the sampler retrieves relatively undisturbed soils below the advancing auger. The sampler is extracted from the borehole and the brass tubes containing the soil samples are removed. Upon removal from the sampler, the selected brass tubes are immediately trimmed and capped with aluminum foil or teflon liners and plastic caps. They are then labeled and refrigerated to 4° C for delivery, under chain-of-custody, to the analytic laboratory. These procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOCs) prior to chemical analysis.

One soil sample collected at each sampling interval is analyzed in the field using a photoionization detector (PID). The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons and to establish which soil samples will be analyzed at the laboratory. The soil sample is sealed in a zip-lock plastic bag and placed in the sun to enhance volatilization of the hydrocarbons from the sample. The sample is then measured by the PID and the data recorded at the depth corresponding to the sample point in the field notes.

Other soil samples are collected to document the stratigraphy and estimate relative permeability of the subsurface materials. Up to 4.5 feet of continuous sample interval may be recovered without advancing the auger by driving 2.5-in ID, 2-in ID, and 1.5-in ID 18-in long split-barrel samplers in succession ahead of the lead auger. This procedure is known as "telescoping". Density or consistency of soils are measured by blow counts, Torvane or pocket penetrometer. All drilling and sampling equipment is steam-cleaned prior to use at each site and between boreholes to minimize the potential for cross-contamination. Brass tubes and split-barrel samplers are steam-cleaned or washed with Liquinox™ detergent and double-rinsed between each use.

STANDARD OPERATING PROCEDURE:
GROUNDWATER SAMPLING

Prior to groundwater sampling, a measurement is made of the static water level using a water level probe. At sites where the presence of separate-phase hydrocarbons is suspected, an interface probe, product bailer or product-measuring paste is used to measure product thickness. Water level and interface probes are cleaned with Liquinox™ solution and rinsed with de-ionized (DI) water between wells. The static water level and well depth are used to calculate the well casing volume. A minimum of 3 to 4 well casing volumes of water are purged from the well prior to sampling in order to obtain a representative sample of the groundwater from the formation surrounding the well. Wells should be purged and sampled in order of least to highest suspected concentrations.

Purging equipment can consist of PVC, Teflon™, or stainless steel bailers; or bladder, airlift, mechanical, or electric submersible pumps. Purging and sampling systems may be dedicated to (installed in) the well or portable. Appropriate personal protective equipment is always worn during purging. The well is purged until the clarity, temperature, pH, and conductivity of the discharge water has stabilized. These parameters are measured and recorded initially, after every well casing volume is removed, and after the sample is collected. In some localities, turbidity, Eh, and dissolved oxygen measurements may also be required. If possible, the purge rate is low enough to avoid dewatering the well. Purged water is stored on-site in labeled drums or tanks pending proper disposal. If the well is purged dry prior to the removal of three or four casing volumes of water, the water level is allowed to recover to 80% of the static level before sampling. This is to minimize volatilization of hydrocarbons. Slow recovering wells may be sampled before the 80% recovery if a minimum of two hours, or 48 hours if necessary, have elapsed since the end of purging.

Sampling equipment may consist of Teflon™ or stainless steel bailers, or bladder pumps. New sampling gloves are worn during each sample collection. Sample containers typically consist, depending on the analysis, of 40 milliliter (ml) volatile organic analysis (VOA) vials with teflon septa, 1 liter (L) amber glass bottles, or plastic bottles. HCl, H_2SO_4, HNO_3, or other preservatives are added to sample containers as appropriate to prevent biodegradation of samples. The groundwater sample is decanted into each VOA vial to form a meniscus at the top to eliminate air bubbles when capped. Usually at least 3 VOA vials are filled from each well to ensure a duplicate. The sample is labeled with date, time, sample #, job #, and analysis, refrigerated to 4° C, and delivered under chain-of-custody to the analytical laboratory. For quality control purposes, duplicate samples, trip blanks, and equipment blanks are usually collected. The duplicate sample is given a different number than the original sample from the same well. Trip blanks are prepared by the laboratory using DI water and remain in the cooler. Equipment blanks are collected from sampling equipment using DI water after the equipment has been decontaminated and rinsed.

All non-dedicated purging and sampling equipment is washed in Liquinox™ solution and triple-rinsed with DI water after use in every well to avoid cross-contamination. Equipment is steam-cleaned at sites where free product is present.