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CET Environmental Services, Inc.

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September 13, 1993

Ms. Jennifer Eberly Hazardous Materials Specialist ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY 80 Swan Way, Room 350 Oakland, CA 94621

> Workplan Drilling/Monitoring Well Installations of Wells MW4, MW5, MW6, and Soil Boring B1 at Dreyer's Grand Ice Cream 5929 College Avenue, Oakland, CA 94618 (CET Project No. 3534-206)

Dear Ms. Eberly:

Subject:

CET Environmental Services, Inc. (CET) is pleased to present this workplan for additional site characterization activities at the subject facility. The proposed scope of work is in accordance with the recommendations presented in the April 30, 1993 report compiled by Aqua Terra Technologies, Inc. ("First Quarter 1993, Groundwater Monitoring Report & Subsurface Investigation"). A copy of the report was submitted to the Alameda County Health Care Services Agency (ACHCSA). This workplan was prepared in accordance with the State Water Resources Control Board Leaking Underground Fuel Tank (LUFT) Manual (October 18, 1989 revisions), the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites (August 10, 1990) and the ACHCSA requirements outlined in their letter dated March 27, 1992. The proposed scope of work includes installation of three additional monitoring wells and one soil boring, compilation of hydrogeologic cross sections to define migration pathways based on all available subsurface data, data evaluation and report preparation.

BACKGROUND

Site Location and Description

The subject site is located in the City of Oakland, California, approximately 0.25 miles north of California Highway 24 and approximately 0.25 miles south of the Berkeley city limits (Plate 1, Attachment A). The property is bounded by Claremont Avenue to the northwest, College Avenue to the east, and Chabot Road to the south (Plate 2, Attachment A). The site topography is relatively flat, at an elevation of approximately 172.5 feet above mean sea level (MSL) with a

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slight slope to the southwest. The subject site is currently occupied by the corporate offices and adjacent parking lot of Dreyer's Grand Ice Cream, Inc.

History of Underground Tank Removal & Subsequent Subsurface Investigations

On December 13, 1989, one 1,000-gallon and one 8,000-gallon gasoline tank, two 4,000-gallon diesel tanks and one 2,000-gallon diesel tank were removed from the southeast corner of the property by Petroleum Engineering, Inc. of Santa Rosa, CA (before construction of the current office building at the site). Two 1,000-gallon waste oil tanks were also removed from the mid-southwest portion of the property during December, 1989. The approximate locations of the former underground tank excavations are shown on Plate 2, Attachment A. Subsequent soil sample analyses by Pace Laboratories, collected on December 14, 1989 indicated that Total Petroleum Hydrocarbons (TPH) as gasoline (TPH/g) concentrations in soil samples from the bottoms of the fuel tank excavations ranged from 30 milligrams per kilogram (mg/Kg), or parts per million (ppm) to 320 ppm. TPH diesel (TPH/d) concentrations ranged from 17 ppm to 350 ppm. Benzene concentrations in the same soil samples ranged from 46 micrograms per Kilogram (ug/Kg), or parts per billion (ppb), to 1,300 ppb.

On February 6, 1990, personnel from Aqua Terra Technologies, Inc. (ATT), the former consultant for this project, observed the excavation of about 100 cubic yards of soil from the waste oil tank excavation. Based on soil sample analytical results, maximum concentrations of oil and grease and diesel were 5,915 ppm and 1,800 ppm, respectively. Soil sample results for the tank pit, following overexcavation, indicated the presence of oil and grease in one confirmation sample at 120 ppm. Analysis for TPH/g and TPH/d were not performed on the confirmation samples. No benzene, toluene, ethylbenzene and total xylene (BTEX) constituents were detected in the tank excavation soil samples. All soils excavated from the waste oil tank pit were disposed at a Class II landfill.

On February 12, 1990, the onsite contractor reportedly removed an additional 400 to 450 cubic yards of soil from the bottom of the excavation. The removal was apparently required because the clayey soils could not be properly compacted. ATT was notified of the overexcavation activities after the excavation had been backfilled; testing within the overexcavated area was apparently not performed. ATT was retained to test the stockpiled soils. The average TPH/g concentration



was 170 ppm. The soils were aerated on site to concentrations below 100 ppm and were disposed by others at a licensed landfill facility.

During the period July 16 through July 18, 1991, ATT installed three groundwater monitoring wells on the subject property ranging in depths from 27 to 30 feet below ground surface (bgs). Two of the wells, MW2 and MW3, were installed adjacent to the waste oil and fuel tank excavations, respectively, in the presumed downgradient groundwater flow direction. MW2 and MW3 were constructed using four inch diameter casing and screen. MW1, a 2-inch diameter well, was installed upgradient and west of both tank areas. Analytical results for the three wells indicated relatively high levels of gasoline constituents in MW2 and MW3, and recently, minor diesel hydrocarbons in MW1. Since August 1991, TPH/g concentrations have ranged from 38,000 micrograms per liter (ug/L) or parts per billion (ppb), to 91,000 ppb in MW2, and from 3,300 ppb to 14,000 ppb in MW3. The analytical results for the most recent monitoring event indicated TPH/g concentrations of 58,000 ppm and 14,000 ppm (June 2, 1993 monitoring event) in MW2 and MW3, respectively. Benzene concentrations in the same wells during the period August 1991 through June 2, 1993 ranged from 13 ppb to 8,200 ppb.

During the period February 24 through March 8, 1993, ATT conducted a Powercore soil and groundwater sampling program involving nine sampling locations with borings ranging in depth from 17 to 25 feet. Six groundwater samples were collected and submitted for analysis. Three of the borings were dry. None of the water samples contained detectable petroleum hydrocarbons. Gasoline constituents were detected in soil samples from boring PC8, located west of the former waste oil tank excavation and in soil samples from PC4, located offsite beneath the north side of Chabot Road. TPH concentrations were at or less than 12 ppm. Due to core refusal, groundwater and soil quality could not be evaluated at several locations.

PROPOSED SCOPE OF WORK

The following scope of work has been developed to further characterize the extent of petroleum hydrocarbon contamination. The results of the additional site characterization activities, which will be summarized in the next quarterly monitoring report, will assist in the evaluation of the feasibility of various remedial alternatives.



Task 1 - Drilling, Soil Sample Collection, and Well Installations

An underground utility check will be performed prior to initiating drilling activities. The utility check will consist of notifying Underground Service Alert (USA), reviewing available utility plans for the subject site (if available), and retaining a private underground utility locating service, if necessary. A California licensed drilling contractor will be retained to provide drilling services. Truck-mounted or portable hollow-stem auger drilling equipment will be utilized for all subsurface exploration and well construction. Soil cuttings will be placed on and covered with visqueen plastic sheeting or placed in DOT 17H 55-gallon drums, as appropriate. All subsurface equipment will be accomplished by steam cleaning or by scrubbing in a solution of Alconox and potable water followed by two purified water rinses. All decontamination rinsate water will be moved by a licensed transporter to an appropriate licensed disposal facility based on sample analytical results.

CET proposes to install three additional monitoring wells and drill one soil boring at the subject site. The locations of the proposed monitoring wells, MW4, MW5, and MW6 and soil boring B1 are shown on Plate 3, Attachment A. The purpose of the additional soil boring/wells is to define the extent of petroleum hydrocarbons in soils and groundwater, and to provide additional data for defining the groundwater flow direction, which CET has demonstrated to be variable.

Monitoring well MW4 will be located southwest of MW3 in the planter area (see Plate 3). The purpose of MW4 is to determine the extent of contamination in the historic (regional) downgradient direction. MW4 may also serve as an observation well for aquifer and vapor extraction pilot testing.

Monitoring well MW5, will be located offsite on the adjacent developed property (owned by Dreyer's), west of the former waste oil tank excavation. This well will determine whether groundwater within the first aquifer in the vicinity of Powercore borings PC7 and PC8 is affected by gasoline constituents (Powercore borings PC7 and PC8 met refusal at approximately 18 feet, and water samples could not be collected due to dry/low permeability conditions). Monitoring well MW5 will extend to a total depth of about 30 feet below ground surface (bgs).



Monitoring well MW6 will be located onsite in the planter area near the sidewalk of College Avenue, east of the former fuel tank pit. The purpose of MW6 will be to monitor groundwater quality downgradient of the former fuel tank excavation when the flow direction is northeasterly, as has been the case for the first two quarters of 1993. Additionally, MW6 will be located near the approximately 20foot-deep utility trench beneath College Avenue, which may be affecting groundwater flow in the site vicinity.

Boring B1 will be drilled in the parking lot/driveway area at a distance approximately halfway between the former waste oil tank pit and the former fuel tank pit. The boring will be advanced to a depth of approximately 30 feet bgs. Soil samples will be collected from immediately above the first water bearing zone, and/or from the following depths: 10, 13, 15, and 20 feet. Boring B1 will help define the extent of contamination in the vicinity of both former tank areas, and will help determine if the two groundwater plumes overlap. If significant contamination is identified in boring B1, as determined by visual observation of soil samples and photoionization detector (PID) readings, CET may recommend that an extraction well (vapor and/or groundwater) be installed at this location.

Soil samples will be collected from each boring at five-foot intervals or more frequently at obvious signs of contamination, immediately above first encountered groundwater, or at significant changes in lithology, beginning at a depth of five feet and continuing to the bottom of each borehole. A grab groundwater sample will also be collected from soil boring B1. Soil samples will be logged using the Unified Soil Classification System (USCS) under the supervision of a California Registered Geologist (R.G.).

Boreholes MW4, MW5, and MW6 will be completed as groundwater monitoring wells. CET will complete application documentation and obtain necessary permits from the Alameda County Flood Control & Water Conservation District (Zone 7) to install two, two-inch diameter and one, four-inch diameter groundwater monitoring wells at the subject site. The monitoring wells will be constructed in accordance with the protocol presented in Attachment B. The monitoring wells will be screened from approximately 10 to 30 feet bgs (based on the construction of existing monitoring wells, and previously measured groundwater levels at the subject site). The exact and final locations will be dependent on utility locations, facility and safety requirements, and ACHCSA recommendations.



Task 2 - Well Development, Survey, & Groundwater Sample Collection

The newly constructed monitoring wells will be developed not less than 24 hours following well construction, and will be sampled not less than 24 hours following well development. All well installation and development protocols will be in accordance with ACHCSA and RWQCB guidelines and the protocol presented in Attachment B. The elevations of the top of the well casings (TOC) will be determined relative to mean sea level (msl) by a California licensed surveyor. Groundwater samples will be collected from each of the new monitoring wells and from existing monitoring wells on a quarterly basis. A grab groundwater sample will be collected from B1.

Task 3 - Laboratory Sample Analysis

Selected soil samples (estimate 3 samples per boring) will be submitted to a Statecertified analytical laboratory for the following analyses: Total Petroleum Hydrocarbons (TPH) quantified as diesel (TPH/d) by EPA Test Method 8015, TPH as gasoline (TPH/g) and benzene, toluene, ethylbenzene and total xylenes (BTEX), by EPA test methods 8015 and 8020, respectively.

Groundwater samples collected from the monitoring wells will be analyzed for TPH/d by EPA Test Method 8015 and TPH/g and BTEX by EPA test methods 8015 and 602, respectively. In addition, one grab water sample will be collected from boring B1 and analyzed by the test methods above.

Task 4 - Data Evaluation and Report Preparation

CET will evaluate all chemical analytical and hydrogeologic data collected at the subject site to date and will summarize the results in a technical report which will be combined with the next Quarterly Monitoring Report. As part of the data evaluation task, CET will prepare two hydrogeologic cross sections to assist in determining the extent of contamination, the affected zone or zones, and potential migration pathways. The summary report will also include tabulated analytical results and water level measurements/elevations, boring logs, well construction schematics, well sampling and development records, original laboratory test reports, contour maps showing groundwater flow direction, site plan(s) summarizing analytical test results, and our conclusions and recommendations. The results will assist in designing aquifer and pilot vapor extraction tests, and will



form the basis for evaluating the feasibility of various remedial alternatives. The report will be signed by a California Registered Geologist (R.G.) or Professional Engineer (P.E.).

Site Safety Plan

A site specific health and safety plan, for the proposed scope of work outlined above, is provided in Attachment C.

Please contact us if you have any questions or comments regarding the contents of this workplan.

Sincerely,

CET ENVIRONMENTAL SERVICES, INC.

Tenance Elaite for

Benjamin Berman Staff Scientist

Tonancel Cante

Terrance E. Carter Senior Environmental Engineer

Tomarce E. Casto for

Mark R. Lafferty, R.G. Senior Hydrogeologist/Project Manager California Registered Geologist #4701 (Expires 6/30/94)

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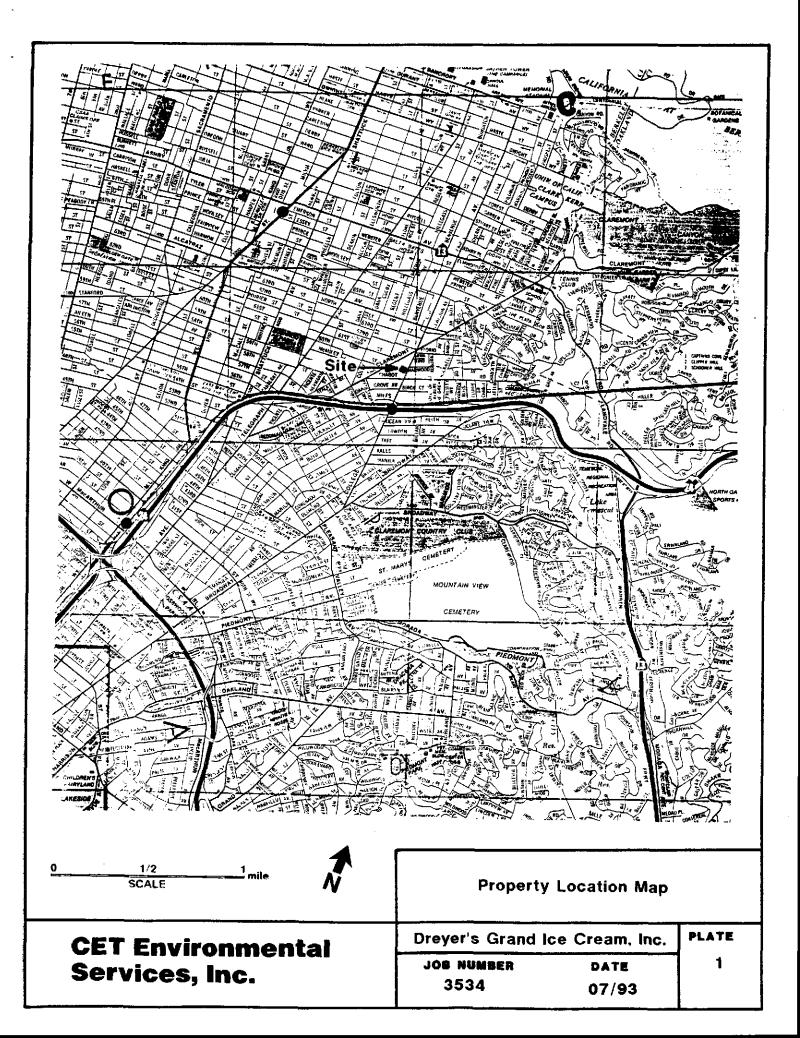
Attachments

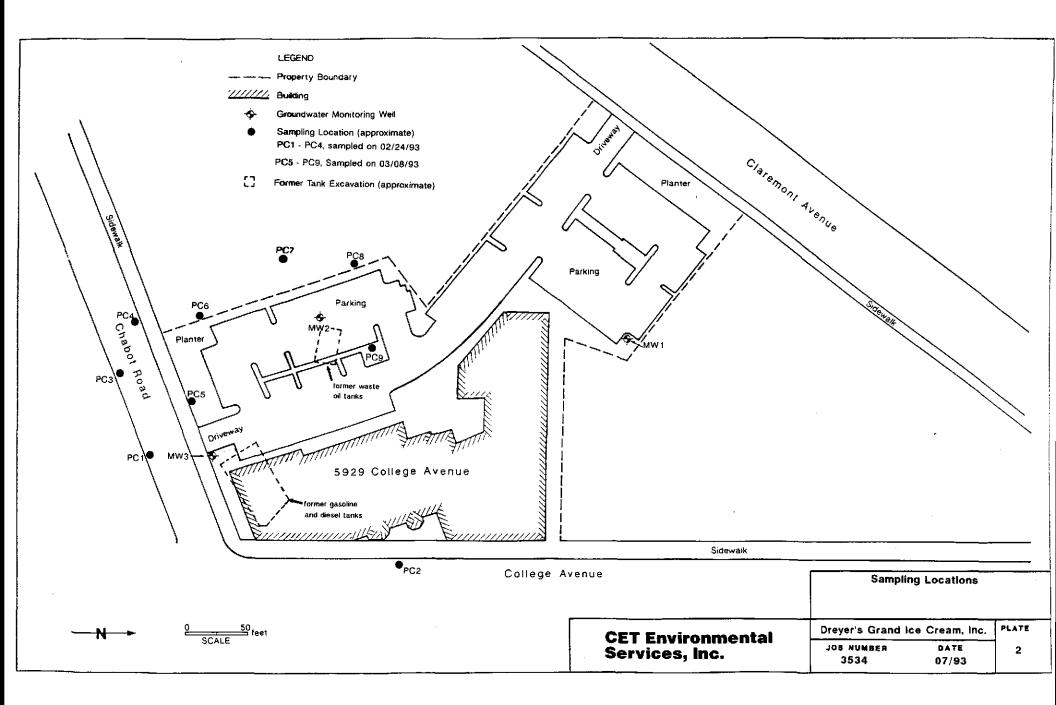
cc: William C. Collett, Dreyer's Grand Ice Cream

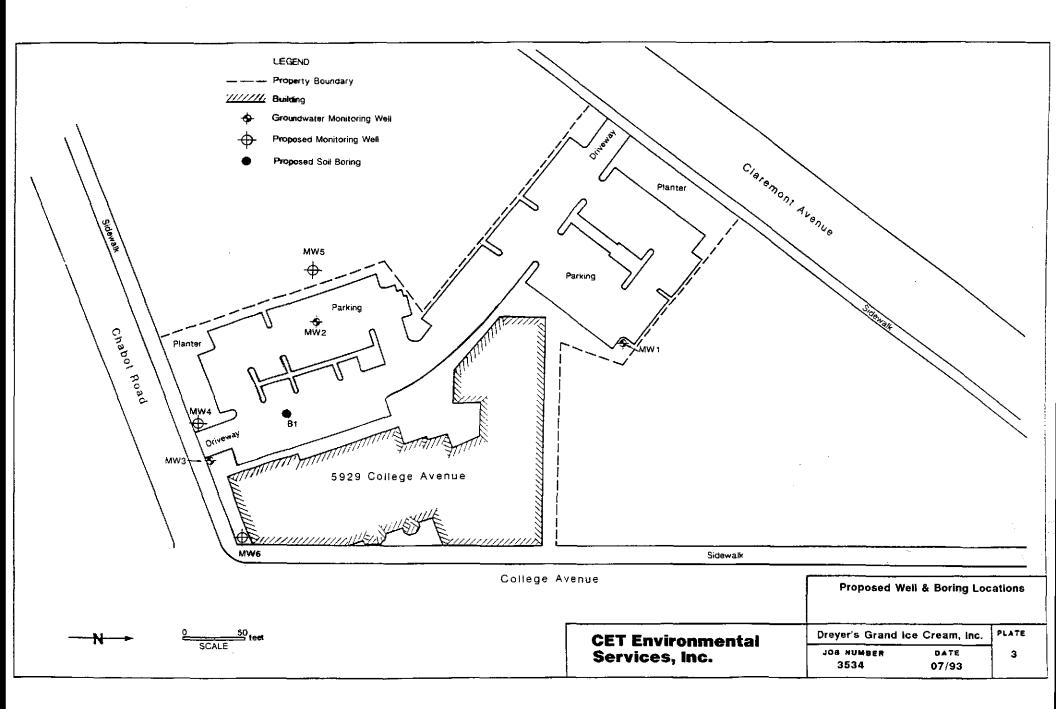


ATTACHMENT A

Plates









ATTACHMENT B

Drilling Procedures & Groundwater Monitoring Well Construction/Design



DRILLING PROCEDURES & GROUNDWATER MONITORING WELL CONSTRUCTION/DESIGN

DRILLING AND SAMPLING PROCEDURES

All borings for well construction will be drilled using eight-inch diameter or larger hollow stem auger equipment. A California Registered Geologist or Engineer will direct or supervise the collection of undisturbed samples of the soils encountered and the preparation of detailed logs for each boring.

Soil sampling will be conducted using a modified California split-spoon sampler, a standard penetration sampler, or a five-foot continuous sampler. Samples will be retained in two-inch to three-inch diameter, six-inch long, clean, brass or stainless steel tubes. The samples will be retained for verification of soil classification and for chemical laboratory analytical testing, as appropriate. Teflon sheeting will be placed between the soil sample and the cap, and the cap will be sealed with PVC tape.

When access limitations do not allow drilling with truck mounted equipment, either a trailer mounted drilling rig, portable power driven, or manually operated soil sampling equipment will be utilized. If soil samples are to be retained for analysis, they will be collected in clean brass tubes fitted within a thin walled drive sampler. The soil samples will be capped and sealed as described above.

All down hole sampling, drilling, and well construction equipment and materials, including augers, casing, and screens will be steam cleaned prior to their initial use. The sampling equipment will be cleaned prior to each assembly by washing with a trisodium phosphate solution (TSP), rinsing with purified water, and allowing to air dry. The auger flights, drill bit, and sampler will be steam cleaned at each boring location.

MONITORING WELL CONSTRUCTION

Monitoring wells will be constructed in accordance with applicable local water district or California Department of Water Resources guidelines. The specific completion details for each well will be determined in the field at the time of drilling by a California Registered Geologist or Professional Engineer experienced in groundwater monitoring system design and installation.

Monitoring wells will usually consist of two or four-inch diameter, Schedule 40 PVC casing and screens with flush, threaded joints. No PVC glue will be used. The screened sections will be machine slotted with either 0.010-inch (0.255 mm) or 0.020-inch (0.51 mm) openings. The smaller slot size will be used where the wells are screened within fine-grained sandy soils, and the larger slots will be used where coarse sand or gravels are encountered. The slotted sections will be fitted with a threaded cap and placed opposite the water-bearing strata in the boring. The blank pipe will be connected to the perforated pipe and will usually extend to just below the ground surface.

The annulus between the side of the borehole and the slotted section will be filled with a clean sand pack to variable depths, but not less than one or two feet above the perforated pipe. The annulus will be packed with either Lonestar No. 1/20 or equivalent (where 0.010-inch slotted pipe is used) or No. 3 or equivalent (where 0.020-inch slotted pipe is used) washed sand filter material. The gradation of the filter material is summarized below:



U.S. Sieve No.	Opening (mm)	Percent Passing (No. 3)	Percent Passing (No. 1/20)
6	3.35	100	
8	2.36	99 - 100	
12	1,70	62 - 78	
16	1,18	15 - 33	100
20	0.85	0 - 8	90 - 100
30	0.60	0 - 4	14 - 40
40	0.425		0 - 5

A seal of bentonite pellets approximately 0.5 to 1.0 foot thick will be placed above the sand pack to reduce the risk of grout penetration into the sand. The bentonite pellets will be hydrated with purified water to form a tight plug. A cement/bentonite grout will be placed above the bentonite plug to a depth of approximately 0.5 to 2.0 feet below the ground surface. The grout will be pumped into the boreholes using a tremie pipe when required by local guidelines or regulation. A flush mounted traffic box or above-ground security enclosure will be set in concrete above the cement/bentonite mixture.

At most sites in sedimentary formations, it is not practical to "rationally design" a filter pack based on sieve analyses. From experience, Lonestar No. 1/20 or No. 3 washed sand, or equivalent, as a filter material has been selected for use in the proposed wells. The 0.010-inch and 0.020-inch slot sizes were selected to retain 100 percent of the filter material.

The completed wells will be enclosed in a traffic rated enclosure placed flush with grade or in an above-ground metal enclosure, and will be fitted with a locking cap. Well head elevations will be determined by a level survey, and well coordinates will be determined by a traverse survey. The level/traverse survey will be referenced to a bench mark of known or assigned elevation, and known coordinates. Once water levels have stabilized, water levels in all wells will be measured.

After the wells have been completed, they will be developed by pumping and surging to clean and stabilize the soils around the screens. A manually operated, positive displacement surge pump and teflon bailer, surge block, and/or centrifugal pump will be used for development. A minimum of 10 well casing volumes of water will be removed during development; however, development will continue until turbidity or sediment content has stabilized. All development equipment will be steam cleaned or triple rinsed in a solution of purified water and tri-sodium phosphate (TSP) prior to its initial use in each well. A well development record will be maintained which will include 1) a description of development, and 3) flow rates during development.

Soil cuttings generated during drilling will be stored in 55-gallon drums or wrapped in plastic sheeting, and water generated during well development and sampling will be retained in secured 55-gallon drums until chemical analytical data from samples are received.



ATTACHMENT C

Health & Safety Plan



CET ENVIRONMENTAL SERVICES, INC. SITE SAFETY PLAN

A. GENERAL INFORMATION

Site:	Dreyer's Grand Ice Cream			
Location:	5929 College Ave., Oakla	5929 College Ave., Oakland, California 94618		
Plan Prepared By:	Kimberly S. Lagomarsino Environmental Scientist	Date: September 16, 1993		
Plan Approved By:	Mark R. LaffertyDate: March 10, 1993Senior HydrogeologistCorporate Health and Safety Officer			
Objective:	Drilling/Installation of groundwater monitoring wells MW4, MW5, and MW6; and soil boring B1.			
Proposed Date of Investigation: October 1993				
Background Review	v: <u>Complete</u> : X	Preliminary:		
Documentation/Summary: See ATT's Second Quarterly report of June 30, 1993 for this site				
Overall Hazard:	Serious: Low: X	Moderate: Unknown:		

B. SITE/WASTE CHARACTERISTICS

Waste Type(s):	<u>Liquid</u> : X	<u>Solid</u> : X	Sludge:	<u>Gas</u> :	
	<u>Corrosive</u> : Toxic:	<u>Ignitable</u> : Reactive:	Х	<u>Radioactive</u> : Unknown:	Other(name):

Facility Description: Office building surrounded by parking areas.

Principal Disposal Method (type and location): Soil from borings and monitoring well development water will be contained onsite; disposal will depend on the results of chemical analyses performed by a California Department of Health Services (DHS) accredited laboratory.

Unusual Features (power lines, terrain, utilities, etc.): none noted.

Status: Active: X Inactive: Unknown:

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NVIRONMENTAL SERVICES, INC. SITE SAFETY PLAN (continued)

History (agency action, complaints, injuries, etc.): None known.

C. HAZARD EVALUATION

Parameter:	TLV IDLH (ppm) (ppm)	<u>skin</u>	HEA <u>eyes</u>	LTH <u>inge.</u>	<u>inha</u> .
PCE	<u>25</u> <u>200</u>	<u> </u>			<u> </u>
TCE Benzene	$ \underline{25} \underline{200} \\ 1 3,000 $				<u> </u>
Gasoline	50				<u> </u>

Special Precautions and Comments: Use NIOSH approved gloves when handling soil samples. Sampling to be conducted in the open air. Soils from cuttings to be placed on visqueen and covered. No drilling or sampling to be conducted during periods of precipitation. Respirators (halfmask air purifying w/organic vapor cartridge) must be worn when the downwind concentration of benzene is more than or equal to 10 ppm (PEL) or 25 ppm for TCE/PCE (PEL); or when volatile hydrocarbon concentrations as indicated by a field PID equal 50 ppm (instantaneous spike) or greater (or at the discretion of onsite personnel's odor tolerance).

D. SITE SAFETY WORK PLAN

Perimeter Establishment: N/A

Site Secured: N/A

Perimeter Identified: N/A

Zone(s) of Contamination Identified: To be determined by soil and groundwater sampling.

Personal Protection:

Level of Protection: A B C D X

<u>Modifications</u>: Level C (includes half-mask air purifying respirators with organic vapor cartridge and dust prefilters) at discretion of site safety officer and/or per criteria outlined below (surveillance equipment).



Surveillance Equipment & Materials:

Instrument: Hnu PID Action Level: instantaneous spike of 50 ppm or more

Site Entry Procedures: Pedestrians will be routed away from the work zone during drilling and sampling.

Decontamination Procedures:

<u>Personnel</u>: Wash hands, face, clothes. Smoking, eating and drinking not permitted in the work zone during active excavation or drilling.

Equipment: Drilling and sampling equipment to be steam-cleaned and/or washed with Alconox.

First Aid (type of equipment available): Fully stocked first aid kit and emergency eyewash with company vehicles.

Work Limitations (time of day, weather, heat/cold stress):

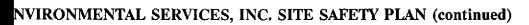
Work limitations include winds greater than 25 mph during active drilling; no work (drilling) during periods of precipitation; work hours: 7:00 A.M. to 6:00 P.M. Monday to Friday.

Investigation-Derived Material Disposal: On site personnel clothing to be decontaminated as indicated. Soil cuttings from groundwater monitoring well installation to remain onsite pending DHS accredited laboratory analyses for soils; groundwater monitoring well development water and equipment rinsate water to be contained onsite pending chemical analysis. If contaminated to be treated onsite and discharged.

Team Composition:

Team Member	Responsibility
Mark R. Lafferty, R.G.	Project Hydrogeologist/Project Manager Corporate Health and Safety Officer
Terrance E. Carter	Project Engineer
Benjamin Berman	Project Scientist/Site Safety Manager

3534-206/DK2/SSPLN



E. EMERGENCY INFORMATION

Local Resources:

Ambulance:	911
Hospital Emergency Room:	
Alta Bates Hospital	510-204-1303
3001 Colby Plaza	
Berkeley, CA	
Poison Control Center:	
John Muir Medical Center	510-939-5800
Police:	911
	/
Fire Department:	911
Explosives Unit:	911
Agency Contact:	
National Response Center (NAC)	
Toxic Chemical and Oil Spills:	1-800-424-8802
Toxic chemical and on opins.	1 000 121 0002
Site Resources:	
<u>Water Supply;</u>	Onsite
Telephone:	Onsite
Radio;	No

Emergency Contacts:

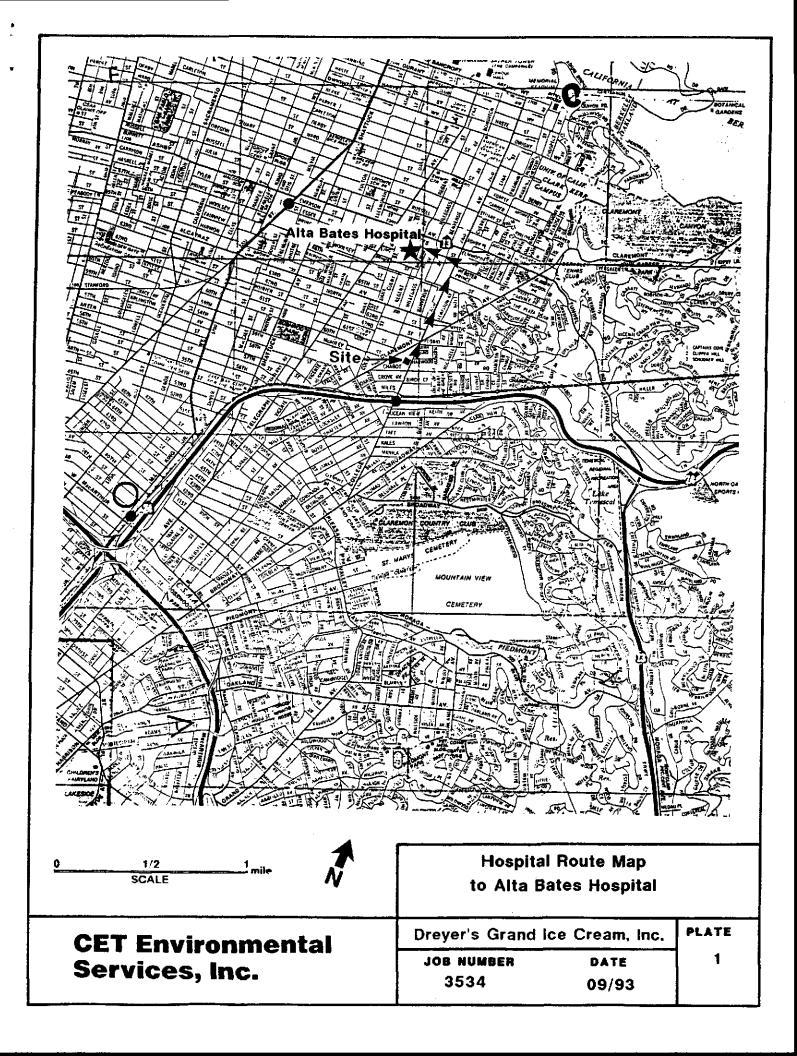
Other:

<u>Name:</u>	Mr. Mark R. Lafferty	Phone:	1-510-934-4884
	CET Environmental Services,	Inc.	

Emergency Routes:

<u>To Hospital</u>: A hospital route map in attached as Plate 1. From site - Proceed north on College Ave., turn east (left) on Webster St., turn south (left) on Regent, Alta Bates Hospital will be on the east (right) side.

N/A



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CET Environmental Services, Inc. 2950 Buskirk Avenue, Suite 120 Walnut Creek, CA 94596 Tel. (510) 934-4884 Fax. (510) 934-5794

FAX TRANSMITTAL FORM

Date: <u>9-13-9</u> 2	3
Fax Trans To:	Jennifer Electe
Location:	ACHESA
Fax Number:	569-4757
From:	Terry CANTER
	-0-3534-206 B12
Comments:	Japaifer - Ben Barmond Asked me to FAX for
	your Reviewer

If transmitting problems occur, call _______ at (510) 934-4884. ADMIN-DK2/FAX0192.FRM