TES

Work Plan for the Additional Investigation of Subsurface Soils at Emeryville Materials Facility Emeryville, California

Prepared by

Land and Water Quality Unit

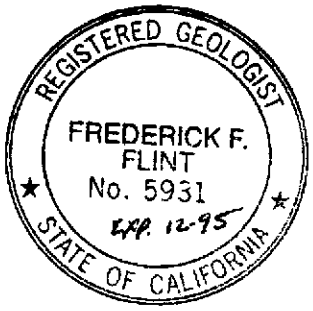
Prepared for

Central Repair and Recovery Services
Pacific Gas and Electric Company

June 2, 1995

Pacific Gas and Electric Company
Technical and Ecological Services
3400 Crow Canyon Road, San Ramon, California 94583

Prepared by:



Frederick F. Flint
Registered Geologist

Approved by:

David A. Gilbert
Land and Water Quality Unit Supervisor

CONTENTS

FIGURES

INTRODUCTION

This work plan presents a proposal to conduct an additional investigation of soils in the vicinity of four former above ground transformer oil storage tanks located within PG&E's Emeryville Materials Facility. The facility is located at 4525 Hollis Street in the city of Emeryville (Figure 1). The purpose of this investigation is to determine the horizontal extent of materials associated with transformer oil storage in the subsurface soils in the vicinity of the tanks at the facility. This work plan has been prepared in response to an Alameda County Environmental Health Department letter dated February 28, 1995.

The primary activities addressed in this work plan include the collection of shallow subsurface soil samples and the submittal of selected samples for chemical analyses. Results of this testing should identify any areas affected by past transformer oil storage operations and will determine the need for further corrective action activities. This work plan presents a description of all activities proposed in the site investigation including the procedures which will be followed during field activities. Plans addressing health and safety, waste disposal and quality assurance are also included. This work plan was prepared under the direction of a California Registered Geologist.

BACKGROUND

The Emeryville Materials Facility was constructed in the early 1920's and has served as a warehouse, repair shop and storage yard. Transformers, capacitors, oil circuit breakers and other miscellaneous equipment used in the electrical transmission and distribution system are brought to the facility for repair and storage.

A tank farm used for the storage of transformer oil was located along the western edge of the property adjacent to 53rd Street. This corner of the property contained a lowered concrete pad with four above ground storage tanks (AST). Three of the tanks had a capacity of 10,000 gallons each while the fourth had a capacity of 11,000 gallons. These tanks were removed between March and September 1993.

In addition to the tanks, the concrete pad also supported a pump which was used for oil transfer. The above-ground tanks were used for the storage of transformer oil. Loading of transformers occurred along the railroad tracks to the east of the tank area.

To date, two investigations have been conducted in the area of the former above ground storage tanks. A preliminary soil investigation was performed in October 1993 to determine the presence of transformer oil in subsurface soils beneath the ASTs (PG&E 1994a). The preliminary soil investigation consisted of nine

Figure 1. Location map of Emeryville Materials Facility.

402.331-94-WP

soil borings within the AST area (Figure 2). Results of the preliminary investigation indicated that:

1. Shallow soils beneath the site consists of sand, clayey sand, silt, and clay.
2. Groundwater was not encountered to a depth of 9 feet.
3. PCBs characterized as Aroclor 1260 are present at concentrations ranging from non-detection (<1 mg/kg) to 385 mg/kg.
4. TEPH is present at concentrations ranging from 640 mg/kg to 16,000 mg/kg.

The second investigation was a groundwater investigation designed to determine the presence of transformer oil in the groundwater (PG&E 1994b). The groundwater investigation consisted of the installation of four monitoring wells to the first water bearing zone (Figure 3). This groundwater investigation determined:

1. The site is underlain by silt and clay with small lenses of gravel to a depth of 18 to 20 feet. Gravel underlies the silt and clay ranging in thickness from 10-15 feet.
2. Groundwater beneath the site exists under confining conditions at depths from 10 to 11.8 feet below the surface.
3. Groundwater beneath the site generally flows north with a gradient of 0.04 ft/ft. In the vicinity of the tank farm, groundwater flows west with a gradient of 0.02 ft/ft.
4. PCBs were not reported in soil or groundwater samples.
5. TEPH as dielectric oil are present in soil from borings ESE-1 and ESE-2 at concentrations up to 2,100 mg/kg. TEPH as dielectric oil is also present in groundwater in wells ESE-1 and ESE-2 up to a concentration of 340 µg/l.
6. Volatile organic compounds as BTEX are present in soil borings ESE-1 and ESE-2. The highest concentrations were found in soils obtained from ESE-1 from a depth of 10 feet, which contained benzene (10 µg/kg), toluene (29 µg/kg), ethylbenzene (3 µg/kg), and xylenes (25 µg/kg). Groundwater from well ESE-2 contained benzene (0.8 µg/l), toluene (1.5 µg/l) and xylenes (2.7 µg/l).

In addition to the above investigations, quarterly sampling was conducted at site monitoring wells on December 12, 1994 and March 13, 1995. Results from March 1995 indicated that TEPH as transformer oil present in wells ESE-1 (500 µg/l), ESE-2 (120 µg/l) and ESE-4 (57 µg/L). PCBs were present in ESE-1 (1.3 µg/l). Results of quarterly monitoring and site investigation activities were submitted to the Alameda County Environmental Health Department.

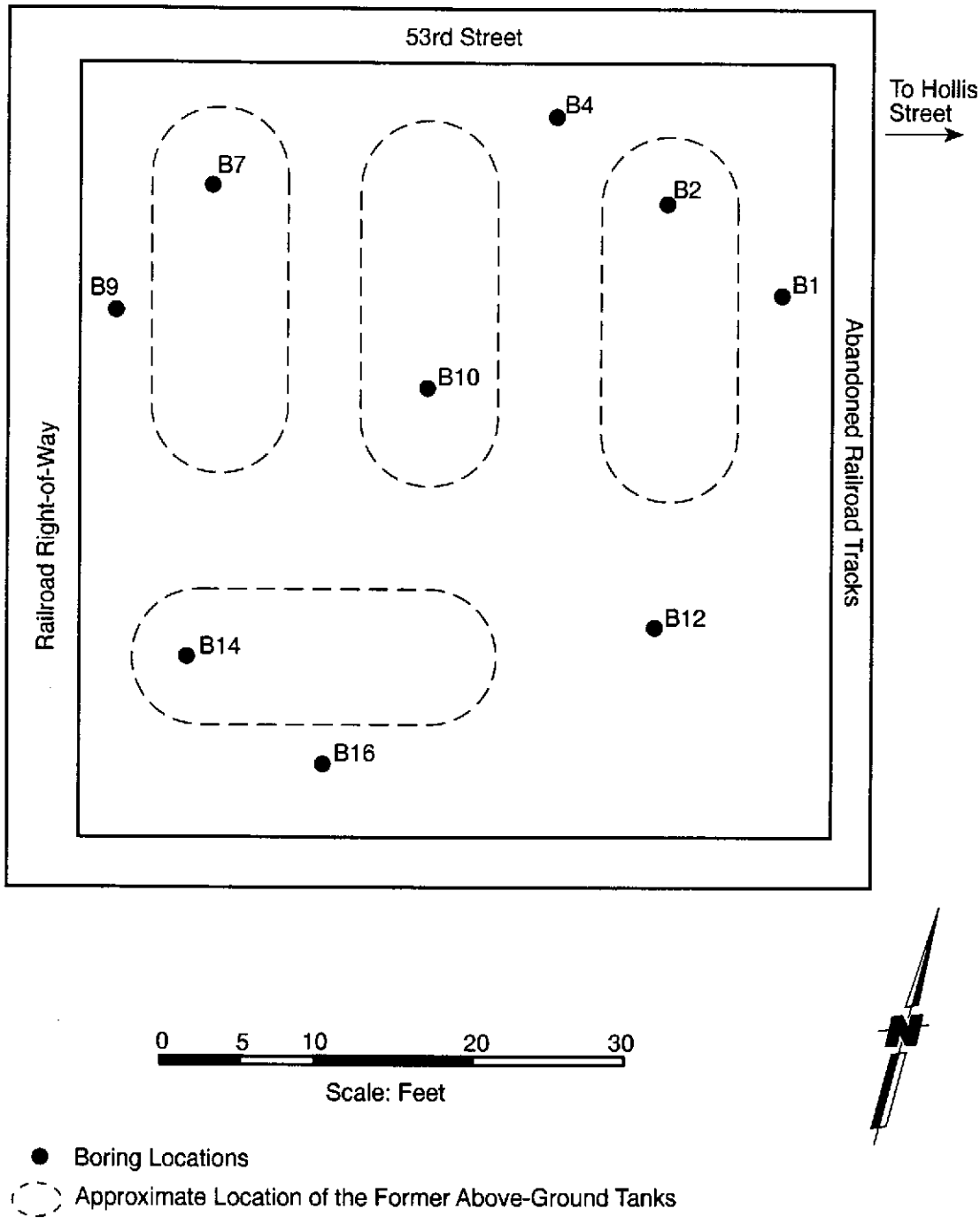


Figure 2. Plot plan, Tank Farm boring locations at Emeryville Materials Facility.

940442/PC18

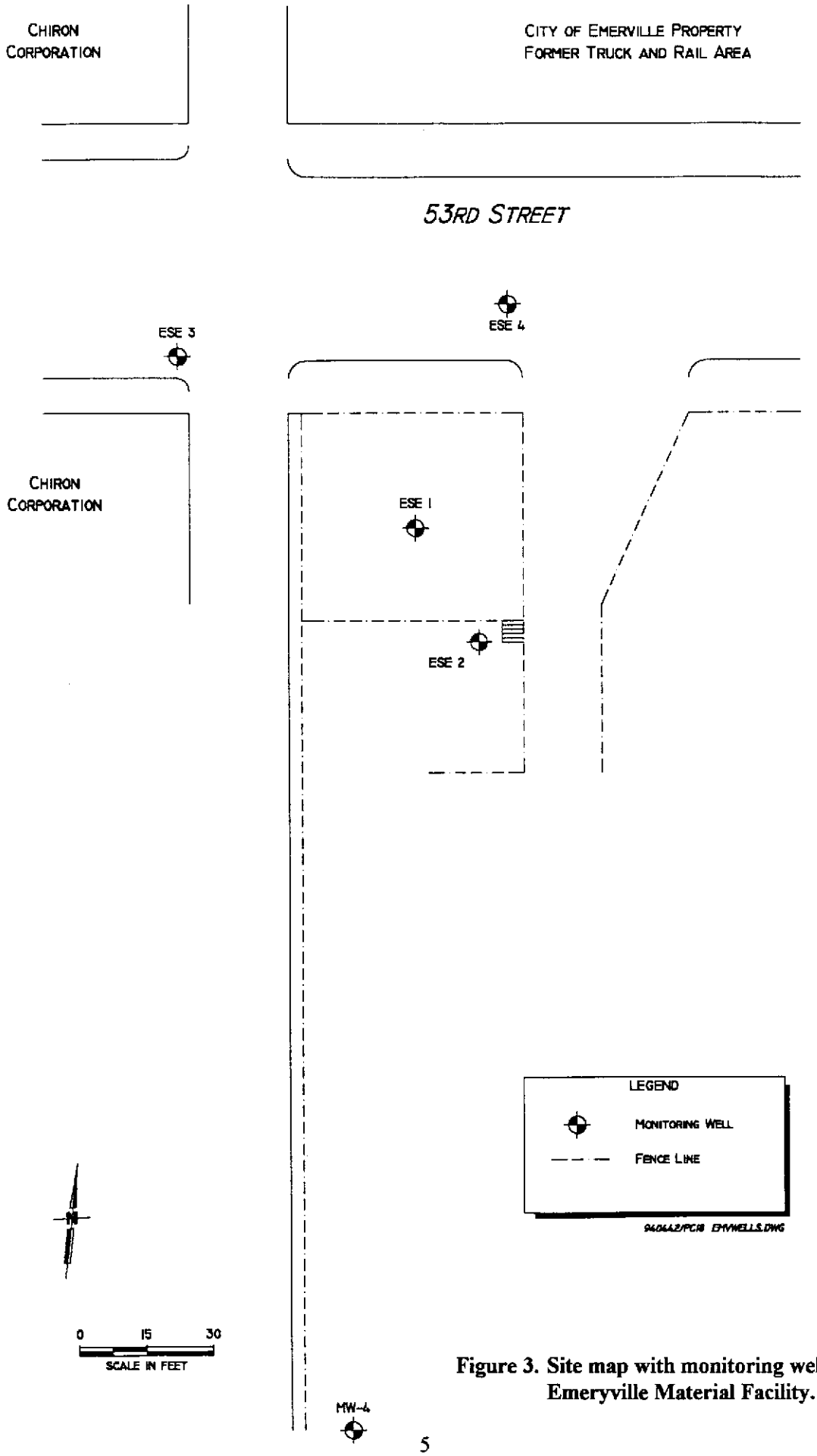


Figure 3. Site map with monitoring wells, Emeryville Material Facility.

SITE DESCRIPTION

Location and Land Use

The Emeryville Materials Facility is located between Hollis and Holden Streets and extends from an area south of 45th Street to 53rd Street in the city of Emeryville, California (Figure 4). The property occupies approximately 16.5 acres and is used as materials storage and supply yard for PG&E. Land use in the near vicinity is industrial. The site was constructed on artificial fill about three to four feet above the natural ground surface at an elevation of approximately 20 feet above mean sea level (USGS 1980). The nearest drainage is Temescal Creek, an intermittent stream which flows west through the property toward San Francisco Bay. Temescal Creek flows through a culvert and drainage pipe in the vicinity of the site. San Francisco Bay is located approximately 2,500 feet west of the site (Figure 5).

Geologic Settings

The facility is located in a lowland area along the eastern shore of San Francisco Bay. The Bay is a flooded river valley in a northwest trending structural trough formed in Franciscan bedrock. Tectonic forces in place during the Pleistocene era (approximately 2 million years ago) created the San Francisco Bay depression as the Oakland/Berkeley Hills were undergoing uplift. Erosion and deposition of material from the Oakland/Berkeley Hills created coalescing alluvial fan deposits along the east shore of the bay.

Alluvial deposits along the East Bay margin include:

- Pleistocene alluvial fan deposits consisting of silty and sandy clays with gravely lenses which grade laterally into margin sediments.
- Upper Pleistocene Merrit Sand consisting of fine grained lenticular sands and silty sands that occur irregularly and vary in thickness from a few inches to 65 feet.
- Late Pleistocene to Holocene alluvial deposits consisting of interbedded clayey gravels, sand and silty clays, and sand-silt-clay mixtures that grade laterally into Merrit Sand.
- Holocene stream deposits.

Generally, Pleistocene alluvial fan material is termed Alameda Formation and the Late Pleistocene sands and alluvium are termed the Temescal Formation (Radbruch 1957). Classification of these alluvial units into stratigraphic formations are subject to interpretation.

Previous investigations indicate that the facility is underlain by approximately 3–4 feet of fill. This fill is underlain by Pleistocene alluvial fan deposits consisting of thick sequences of silty and sandy clay with thinly interbedded and discontinuous gravel lenses.

Shallow groundwater occurs at an elevation of about 14 to 18 feet above mean sea level. General groundwater flow direction is north westerly toward the bay shoreline.

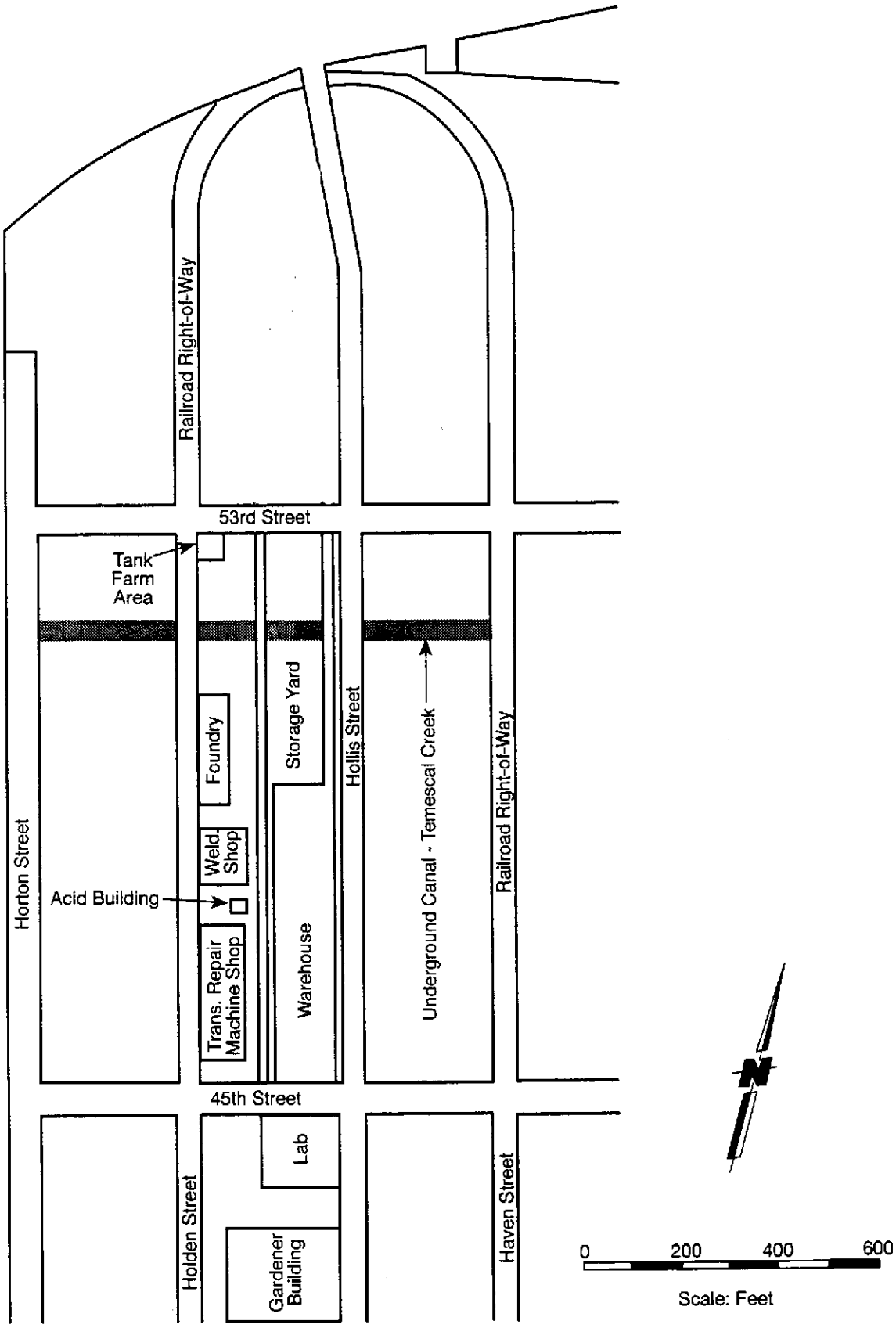


Figure 4. Site plot plan, Emeryville Materials Facility.

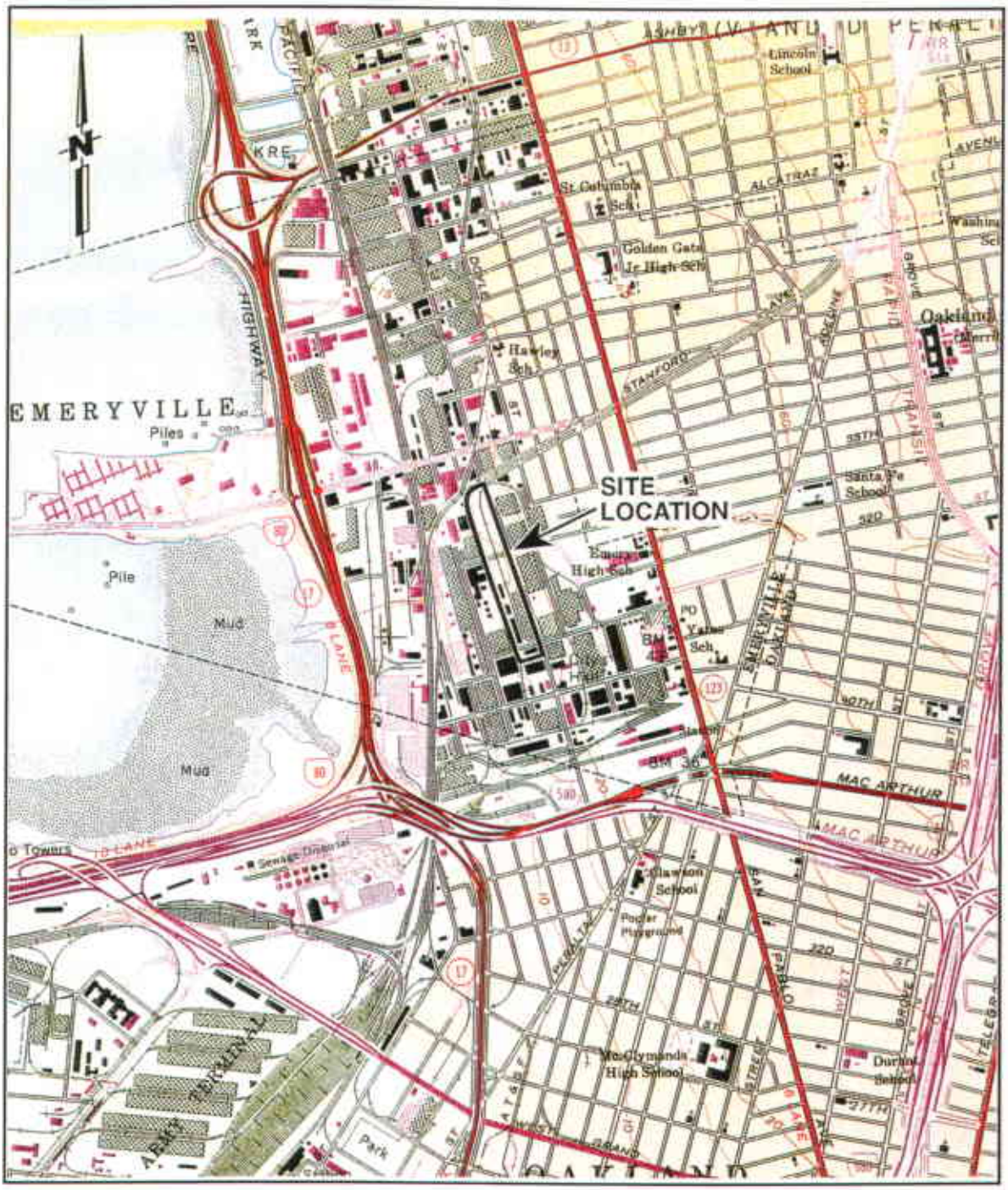


Figure 5. Topographic map of Emeryville Materials Facility.

402.331-94-WP

PROPOSED SITE INVESTIGATION

OVERVIEW

The purpose of the proposed soil investigation is to assess the horizontal extent of chemicals historically stored in the ASTs in the subsurface soils to the south and east of the AST containment area. The objective will be to collect and analyze soil samples to a depth of approximately 10 feet or to the groundwater table.

Personnel And Procedures

All work described in this work plan will be performed under the supervision of a California Registered Geologist. An experienced geologist (assisted by a technician) will log the exploratory borings, collect subsurface samples, perform field screening and testing, and coordinate delivery of the soil samples to a State of California-certified analytical laboratory.

DRILLING AND SOIL SAMPLING PROCEDURES

Boreholes will be drilled at the approximate locations shown on Figure 6. A JMC Environmental Soil Probe (ESP) will be used if possible. If sampling by hand is not possible, then sampling will be conducted using either pneumatic tools or a portable drill rig. The exact number and location of the boreholes will depend on conditions encountered during the field activities. All soil sampling equipment will be cleaned prior to each use.

The portable, manual ESP collects soil samples up to 3 feet long and 1 inch in diameter. Soil samples can be collected from as deep as 18 feet (depending on soil conditions). Each soil core gathered by the ESP is encased in a plastic liner. The core liners are driven into the soil by a 12.5-lb sliding drop hammer that penetrates the soil and fills the plastic liner. Once the probe is driven 3 ft, it is extracted from the ground with a foot-operated jack that allows rapid retrieval.

The exploratory soil borings will be drilled and sampled to a depth of approximately 10 feet or the first occurrence of groundwater (whichever is shallower). Samples of the subsurface soils will be collected at intervals no greater than 5 feet. At the conclusion of each day, all boreholes will be backfilled with a neat cement grout from the total depth to the ground surface.

The following procedures will be used during soil sample collection and handling:

1. Before sampling, the sampler (or equivalent) and sample liners will be thoroughly washed with a trisodium phosphate solution and rinsed with potable water.
2. The samples will be retained in the sample liners with the ends covered with aluminum foil or Teflon® sheets and plastic end caps will be attached.

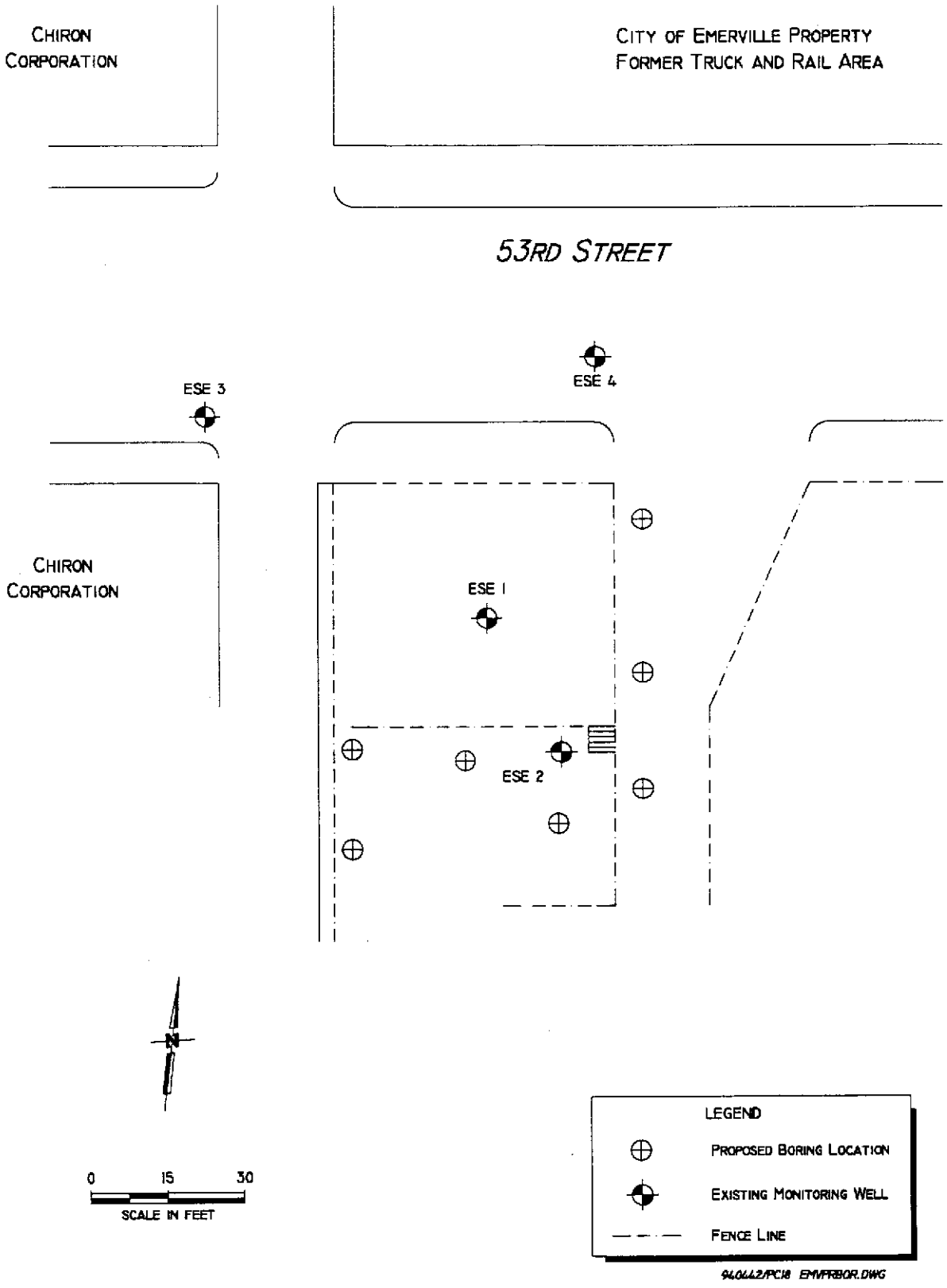


Figure 6. Site map showing proposed boring locations, Emeryville Materials Facility.

3. Each sample will be labeled using waterproof ink with the job name, job number, boring number, sample depth, and date collected.
4. The soil sample will be described on a boring log by the field geologist. This description will include soil classification (ASTM D-2487-83), color, moisture content and consistency (in relative terms), and estimated degree of hydrocarbon content (i.e., organic vapor analyzer measurements).
5. Immediately after sample collection and labeling, the samples will be sealed in a plastic bag and placed in a sturdy ice chest containing either "blue" or dry ice. The temperature in the ice chest will be maintained at or below 4 degrees C.
6. When the ice chest is full (or contains all the samples that will be stored in it), a completed chain-of-custody form will be inserted and the chest will be closed and sealed.
7. The ice chest(s) will be transferred to PG&E's Technical and Ecological Services (TES) (San Ramon) where samples will be selected for chemical analyses. All remaining samples will be placed in a freezer for storage for no fewer than 14 days.

FIELD AND LABORATORY ANALYSIS PROCEDURES

A field assessment of soil quality will be accomplished by analyzing soil samples for petroleum hydrocarbons using a chemical based test developed by Hanby Environmental Laboratory Procedures (HELP), Inc. Based upon results of field analysis, selected samples will be analyzed for total extractable petroleum hydrocarbons (TEPH) as transformer oil by EPA Method 3510/8015, benzene, toluene, ethylzenbene, xylene (BTEX) by EPA Method 8020, and polychlorinated byphenyls (PCBs) by EPA method 8080. All analysis will be conducted by an analytical laboratory certified by the state of California (Chromalab Inc., Pleasanton).

Results of the above assessment will be used along with results of previous site investigations to determine the lateral extent of petroleum hydrocarbons and PCBs within the vicinity of the AST containment area. This information will determine the approximate area which will require corrective action.

QUALITY ASSURANCE/QUALITY CONTROL AND CHAIN-OF-CUSTODY PROCEDURES

To ensure a successful sampling program, quality control and quality assurance procedures will be carefully followed.

Quality Assurance/Quality Control

Quality assurance samples will be used to evaluate the quality and accuracy of data obtained from the field program. Established QA/QC procedures for the analyses will include sample custody procedures, analyses of matrix spikes and method blanks, data reduction, verification of raw analytical data, and maintenance of control charts to monitor analytical performance. These procedures are outlined in the laboratory's Quality Assurance/Quality Control Plan and Standard Operating Procedures which are

available upon request. Organic chemical analyses will be performed in conformance with the standard procedures established by the United States Environmental Protection Agency (EPA) in "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" (40 CFR Part 136, October 1984).

Chain-of-Custody

Chain-of-custody procedures will be used to identify and ensure the traceability and integrity of the samples collected. These procedures also will be used to document the handling and shipping procedures of the samples. The procedures will trace the samples from collection, through all custody transfers, and finally to the storage facility or the analytical laboratory, where the laboratory's internal procedures will govern until final disposition of the samples. This information will be recorded on the chain-of-custody form, which will remain with the samples at all times. The chain-of-custody forms will be used for a packaged lot of samples (i.e., information on more than one sample will be recorded on a single form). If all the samples in a given lot cannot be recorded on a single chain-of-custody form, additional forms will be used and sequentially numbered indicating the total number of pages (e.g., page 2 of 4).

Health and Safety Plan

Guidelines and procedures for field operations have been prepared to protect the work crew and the public. Details of the Health and Safety Plan are included in Appendix A. In event of an emergency, directions are provided for contacts in Appendix B.

WASTE DISPOSAL PLAN

This section provides the guidelines for handling any potentially hazardous wastes generated during the field activities of this investigation.

All soils brought to the surface and rinsate water will be stockpiled and/or stored in individual DOT-approved containers. The containers will be labeled with the borehole numbers, date, and nature of the contents and labeled as analysis pending. All containers will remain on the site until analytical results are obtained from the analytical laboratory. The final disposition of the soils will be determined once chemical analytical results are obtained.

California Uniform Hazardous Waste manifests will be completed by PG&E as required for the transportation and disposal of any hazardous waste that may be generated during the investigation. All wastes will be disposed of in accordance with federal, state, and local regulations.

EVALUATION AND INVESTIGATION REPORT

Upon completion of the field investigation, an evaluation and investigation report will be prepared. This report will present the results of site activities and an assessment of the lateral extent of the chemicals of concern in the shallow subsurface soils within the site boundaries. Methods and procedures used during the investigation and lithologic logs of soil borings will be documented in the report.

SCHEDULE

The proposed investigation will be initiated once authorization from the regulatory agency, and management approval of this work plan is obtained. Field work will be scheduled based on personnel availability and weather conditions. Field sampling is estimated to take four working days and will be initiated after any permitting requirements are met. Laboratory results should be available within two weeks of sample collection. The evaluation and investigation report will be submitted approximately 7 weeks following the project commencement date.

REFERENCES

Emcon. Groundwater Monitoring and Sampling Report, Pacific Gas and Electric Company. Emeryville Materials Facility, Emeryville, California. February 17, 1995.

Emcon. Groundwater Monitoring and Sampling Report, Pacific Gas and Electric Company, Emeryville Materials Facility, Emeryville, California. April 1995.

Pacific Gas and Electric Company. Investigation of Subsurface Soils at Emeryville Materials Facility, Emeryville, California. Technical and Ecological Services, San Ramon, California. Report No. 402.331-93.41. January 10, 1994.

Pacific Gas and Electric Company. Emeryville Materials Facility Above Groundwater Tank Groundwater Investigation, Emeryville, California. Technical and Ecological Services, San Ramon, California. Report No. 402.331-94.10. May 12, 1994.

Radbruch, Dorothy H. 1957. Areal and Engineering Geology of the Oakland West Quadrangle, California, United States Geological Survey Miscellaneous Geologic Investigation Map I–239, USGS, Washington D.C.

United States Geological Survey. 1980. 7.5 minute Quadrangle. Oakland West, California.

Appendix A

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

PG&E is dedicated to ensuring that its employees and contractors work within a safe and healthy environment at potentially hazardous sites. All field personnel working on the project will be SARA-trained in a Hazardous Waste Site Operations 40-hour training class and 8-hour annual refresher. This Health and Safety Plan is prepared in accordance with OSHA regulations contained in 29 CFR 1910.120 and will be implemented during the soil sampling portion of the subsurface investigation described in this work plan. The requirements, specifications, and procedures presented in this plan will apply to all personnel working in the exclusion zone, including employees, contractors, subcontractors, site visitors, and regulatory agency personnel.

Key Personnel

The Site Safety Coordinator/Project Manager will train site personnel in the use of safety and personal protection equipment and will manage the on-site monitoring program. The Site Safety Coordinator/Project Manager will have the authority to deny access to any individual without the proper training or protective equipment required for the site conditions or individuals disregarding site safety procedures. All site personnel will be under the direction of the Site Safety Coordinator/Project Manager. The Site Safety Coordinator/Project Manager for this project at PG&E's Emeryville Materials Facility is Fred Flint (work telephone number 510-866-5808).

Hazard Analysis

The activities addressed by this health and safety plan include subsurface soil collection to depths of approximately 10 feet below the existing ground surface. Although exposure at hazardous levels are unlikely, these activities could expose workers to potentially hazardous materials via dermal contact and inhalation.

The most significant risks associated with polychlorinated biphenyls are dermal absorption and ingestion with inhalation risk minimized due to low volatility of the compounds. Skin contact will be eliminated by use of clothing and gloves. The inhalation hazard will be minimized by use of appropriate respiratory protective devices as determined by on-site air monitoring using a photoionization detector (PID) calibrated with isobutylene gas (100 ppm).

Site Security

The Site Safety Coordinator/Project Manager will establish an exclusion zone around the work area. Restricted activities inside the exclusion zone may be allowed depending on the results of field measurements taken during the course of the activities. Access within this zone will be limited to authorized personnel. All personnel and authorized visitors must contact the Site Safety Coordinator/Project Manager prior to entering and exiting the exclusion zone.

Current enforceable and recommended exposure limits for potential site contaminants are presented in Table A-1. The attached Material Safety Data Sheets present additional hazard information on these compounds.

Personal Protective Equipment

A minimum of U.S. EPA Level D protection will be required within the exclusion zone for any workers engaged in sample collection or other similar activities. Level D protection will include:

1. Hardhat
2. Boots with steel toe
3. Chemical-resistant inner and outer gloves (when workers handle soil samples or sampling equipment).
4. Disposable Tyvek coverall (when workers handle soil samples or sampling equipment).

Level C protection will be required if organic vapor measurements (OVMs) exceed 50 ppm in the worker's breathing zone. Level C protection will consist of:

1. Hardhat
2. Boots with steel toe
3. Disposable Tyvek coverall
4. Safety glasses, splash goggles, or face shield
5. Chemical-resistant inner and outer gloves
6. MSHA/NIOSH-approved half-face or full face dust respirator with organic vapor cartridges.

If the OVMs exceed 200 ppm in the worker's breathing zone, all work shall stop and the exclusion zone shall be evacuated.

Site Security

Access to the work zone during all on-site activities will be restricted to authorized personnel. All personnel and authorized visitors must contact the Site Safety Officer/Project Manager prior to entering and exiting the exclusion zone.

Record Keeping

All site safety records pertaining to this site investigation will be maintained by the Site Safety Officer/Project Manager throughout the project.

Air Monitoring

The site Safety Officer/Project Manager (or another qualified person designated by the Site Safety Officer) will conduct periodic air monitoring, using direct-reading, real-time sampling equipment.

The direct-reading photoionization organic vapor meter (Thermo-Environmental Model 580A or equivalent) will be used to monitor the concentrations of organic vapors in the work area. Organic vapors will be monitored periodically during the collection of soil and/or groundwater samples. The meter will be calibrated at the start of each work period with isobutylene gas. Total organic vapor measurements will be used to determine the appropriate levels of respiratory protection, and identify conditions that would require site evacuation. Total organic concentrations in the worker's breathing zone in excess of 50 PPM will require Level C personal protective equipment. Total organic concentrations in the worker's breathing zone in excess of 200 PPM will require evacuation of the work area until the organic concentrations subside to below 200 PPM.

Additional Training and Information

Prior to any on-site activities, the Site Safety Officer/Project Manager will conduct training on any health and safety related items which are unique or specifically germane to the project. This will at least include the following:

1. Summarize the physical and chemical health and safety hazards which can be expected at the site.
2. Personal protective equipment rationale, use, and maintenance.
3. Exclusion zone entry, exit, and decontamination procedures.
4. Emergency response procedures (i.e., emergency phone numbers, hospital route, procedures to be followed in the event of a chemical spill, fire, or explosion, evacuation routes, mustering areas, etc.).

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT
120 ERIE BOULEVARD
SCHENECTADY, N.Y. 12305

MATERIALS INFORMATION SERVICES

NO. 530

PETROLEUM "ETHER", HIGH BOILING

DATE May 1984

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: PETROLEUM "ETHER", HIGH BOILING
DESCRIPTION: Distillation mixture of aliphatic hydrocarbons mainly in C_7 to C_8 range.
OTHER DESIGNATIONS: Ligroin(e); Aliphatic Naphtha, CAS #008 030 317, CAS #008 030 306; CAS #008 032 324 (C_5-C_{12} Aliphatic hydrocarbons); CAS #064 748 898 Light Aliphatic Solvent Naphtha (see also MSDS #518)
MANUFACTURER: Available from several suppliers, including:
Fisher Scientific Co. - Chemical Manufacturing Div.
P.O. Box 375, Reagent Lane
Fairlawn, NJ 07410 Tel: (201) 796-7100

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA: 8-hr TWA, ppm OSHA PEL**	ACGIH(1983) TLV
Typical Composition:			
Petroleum distillate (Aliphatic Naphtha C_7-C_8)*	~100	500	-
n-Hexane (Minor fraction or nil; see MSDS #397)		500	50
Heptanes, Octanes (Major fraction)		500	400
Other Hydrocarbons (Minor fraction or nil)		500	300
		-	-

*Petroleum fraction related to MSDS #518 but of higher boiling range, higher density, higher flash point.

**Current OSHA PEL; NIOSH (1977) recommended a 10-hr TWA for all petroleum distillates of 350 mg/m3 (85 ppm for heptane; 75 ppm for octane).

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg C	80-130*	Specific gravity, (H_2O=1)	0.68-0.72*
Vapor pressure, 20C, mm Hg	~40*	Volatiles, %	~100
Vapor density (Air=1)	~3.4		
Solubility in water	Insoluble		

Appearance & Odor: Clear, colorless liquid. Slight, characteristic odor.

*Exact values depend on the particular petroleum "ether" cut used. Cuts narrower and lower boiling than this range are also used (see also MSDS #518).

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits in Air, % by Volume: Lower	Upper
>15F (CC)	~450F	~1	~6

Extinguishing media: Dry chemical, carbon dioxide, foam. Use water spray to cool fire-exposed containers and surroundings. Use smothering technique to put out fires. Water may be ineffective. Forced water stream could scatter fire. Highly flammable when exposed to heat or flame. Readily volatilizes to form explosive vapor-air mixtures. Vapors can flow along surfaces to distant ignition sources and flashback.
Firefighters should wear self-contained breathing apparatus.

SECTION V. REACTIVITY DATA

This is a stable material in closed containers at room temperature under normal storage and handling conditions. It does not polymerize. Heating greatly increases the flammability hazard of this OSHA Class IB Flammable Liquid.
It is incompatible with strong oxidizing agents.
Thermal-oxidative degradation can yield partial oxidation products, hydrocarbons, carbon monoxide and carbon dioxide.

GENERAL ELECTRIC

NO. 530

SECTION VI. HEALTH HAZARD INFORMATION

TLV ~300 ppm (See Sect II)

Excessive inhalation of fumes, vapor or mist irritates respiratory passages and can cause headache, dizziness, nausea, inebriation, peripheral nerve disorder (n-hexane metabolites in particular), CNS depression depending on conc. and time of exposure. Contact with high vapor levels or liquid causes transitory irritation of eyes.

Liquid contact with skin is defatting and irritating; prolonged or repeated contact can cause dermatitis. Ingestion causes irritation to mouth, throat, G.I. tract with coughing, vomiting, blurred vision, dilated pupils and diarrhea as symptoms. Aspiration into lungs may cause hemorrhaging, pulmonary edema and chemical pneumonitis.

FIRST AID:

Eye Contact: Flush thoroughly with running water for 15 min., including under eyelids.
Skin Contact: Remove contaminated clothing. Wash affected area with soap and water. Get medical help if large areas of body are exposed or if irritation persists.
Inhalation: Remove to fresh air. Restore and/or support breathing. Have trained person administer oxygen if breathing is difficult. Call a physician.
Ingestion: Contact physician! Aspiration hazard! Do not induce vomiting. Give 2-4 oz. olive oil or USP white mineral oil to drink. If spontaneous vomiting occurs, hold victim's head lower than hips to help avoid aspiration.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Evacuate area for large spills. Provide explosion-proof ventilation; remove ignition sources. Those involved in clean up should use protection against liquid contact and vapor inhalation. Contain spill. Do not send to sewer or allow to enter streams or surface water. Pick up liquid for reclaim or disposal. Add absorbent solid (sand or vermiculate) to small spills and residues and pick up and place in appropriate closed container for disposal using non-sparking tools. Trace residues and vapors can be dispersed with evaporation and ventilation.

DISPOSAL: Scrap solvent may be disposed of through a licensed waste disposal company, or by controlled incineration; absorbed material can be buried in an approved landfill. Report spills that enter (or threaten to enter) navigible waters.

Follow Federal, State, and Local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Use general ventilation and local exhaust ventilation (explosion-proof) to keep vapors and mists at a low level. Where respiratory protection is needed, an approved organic vapor cartridge respirator with full facepiece can be used below 1000 ppm. A chin type organic vapor canister gas mask is required above 1000 ppm. Use an air-supplied or self-contained respirator with full facepiece above 5000 ppm.

Use rubber gloves to prevent repeated or prolonged contact with liquid and safety glasses for eye protection where splashing is possible. Conditions of use may require additional protection against body contact with liquid.

Provide an eyewash station, washing facilities and safety shower.

Promptly remove and isolate solvent-contaminated clothing (fire and health hazard); launder before reuse.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in closed containers in a well-ventilated area. Keep away from strong oxidizing agents and sources of heat or ignition. No smoking in areas of storage or use. Electrically bond and ground containers for transfers to prevent static electric sparks. Near this material use explosion-proof electrical equipment and non-sparking tools. Handle and store as an OSHA Class IB flammable liquid.

Wear clean work clothing. Use with good ventilation. Follow good hygiene practice. Avoid prolonged or repeated skin contact and breathing of vapors or mists. DO NOT INGEST!

DOT Classification: FLAMMABLE LIQUID I.D. No. UN1255 Petroleum Naphtha, NA1268 Naphtha Distillate, UN1266 Petroleum Distillate Label: FLAMMABLE LIQUID

DATA SOURCE(S) CODE: 1,2,4-7,9,12,14,31,34,38

[redacted]

APPROVALS: MIS CRD

INDUST. HYGIENE SAFETY 5/29/84

MEDICAL REVIEW: 15 June 1984

GENERAL ELECTRIC

MATERIAL SAFETY DATA SHEET

POLYCHLORINATED BIPHENYLS (PCBS) REV.DATE 11/01/88

*** SECTION 1 IDENTIFICATION ***

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303
CAS REGISTRY NO:
PROD CODE:
--- SYNONYMS (ALIASES):
P01562
07534
CHLORODIPHENYLS

INFORMATION SUPPLIED BY:
PJ IGOE, BS
PHONE: 518-377-8855
U.N.NUMBER: UN2315
CHEM.FAM:

*** SECTION 2 INGREDIENTS *** A=ACGIH O=OSHA N=NIOSH S=STATE OSHA M=MSHA R=NRC C=CORPORATE 9=OTHER

MATERIAL	PERCENT RANGE		EXP. LIMIT	UNITS
ALL PCBS/AROCLORS	42.00	54.00		

*** SECTION 3 PHYSICAL DATA ***

BOILING PT: 527-725 F, 275-385 C
MELTING PT: -31- 87.8 F, -35- 31 C
PH INFO: PH AT G/L H2O
SPECIFIC GRAVITY (H2O=1):
PACKING DENSITY: (KG/M3)
EVAPORATION RATE:
APPEARANCE:
CLEAR TO LIGHT YELLOW MOBILE OIL TO A STICKY RESIN
ODOR:
A SWEET "AROMATIC" ODOR.

VAPOR PRESSURE:
VAPOR DEN.:
SOLUBILITY IN WATER: INSOLUBLE
% VOLATILES BY VOL: 1.4
ODOR THRESHOLD (PPM):

*** SECTION 4 FIRE AND EXPLOSION HAZARD DATA ***

FLASH PT: 284 -392 F, 140-200 C
AUTOIGNITION TEMP: NOT FOUND F, C
LOWER EXPLOSIVE LIMIT (LEL): NOT FOUND % VOL.
UPPER EXPLOSIVE LIMIT (UEL): NOT FOUND % VOL.
SPEC. HAZARD:

---NFPA CLASS---
HEALTH: 1
FIRE: 1
REACTIVITY: 0
OTHER:

---------- FIRE AND EXPLOSION HAZARDS ----------
IF A TRANSFORMER CONTAINING PCBS IS INVOLVED IN A FIRE, ITS OWNER MAY BE REQUIRED TO REPORT THE INCIDENT TO APPROPRIATE AUTHORITIES. CONSULT AND FOLLOW ALL PERTINENT FEDERAL, STATE, AND LOCAL REGULATIONS.

---------- EXTINGUISHING MEDIA ----------
USE WATER SPRAY/FOG, CARBON DIOXIDE (CO{2}), DRY CHEMICAL, OR "ALCOHOL" FOAM TO EXTINGUISH FIRES THAT INVOLVE POLYCHLORINATED BIPHENYLS. ALTHOUGH IT IS VERY DIFFICULT TO IGNITE PCBS, THEY ARE OFTEN MIXED WITH MORE FLAMMABLE MATERIALS (OILS, SOLVENTS, ETC.)

--------- SPECIAL FIRE FIGHTING INSTRUCTIONS ----------
WEAR A SELF-CONTAINED BREATHING APPARATUS (SCBA) WITH A FULL FACEPIECE OPERATED IN THE PRESSURE-DEMAND OR POSITIVE-PRESSURE

MODE; FIRE FIGHTERS MUST ALSO WEAR A COMPLETE SET OF PROTECTIVE CLOTHING.

---------- OTHER TEXT ----------

COMMENTS: THE HAZARDS OF PCB FIRES ARE ASSOCIATED WITH THE POSSIBILITY OF THEIR BEING RELEASED INTO THE ENVIRONMENT WHERE THEY AND THEIR PRODUCTS OF DEGENERATION CAN POSE SERIOUS LONG-TERM HEALTH RISKS. THESE POTENTIAL PROBLEMS ARE HEIGHTENED BY THE PCBS' RESISTANCE TO BIOLOGICAL AND CHEMICAL DEGRADATION AND BY THE POSSIBILITY THAT THEY WILL CONTAMINATE UNDERGROUND WATER SYSTEMS (SEE SECT. 5)
*RANGES FROM 284DEG.F (140DEG.C) TO 392DEG.F (200DEG.C)

*** SECTION 5 HEALTH HAZARD INFORMATION ***

---------- EXPOSURE LIMITS ----------

REFER TO INGREDIENTS SECTION FOR EXPOSURE INFORMATION.

---------- COMMENTS ----------

TARGET ORGANS: SKIN, EYES, EYELIDS, BLOOD, LIVER.

---------- ROUTES OF ENTRY ----------

INHALATION, SKIN CONTACT/ABSORPTION.

---------- SYMPTOMS OF EXPOSURE ----------

ACUTE EFFECTS: SKIN AND EYE IRRITATION, ACNEFORM DERMATITIS, NAUSEA, VOMITING, ABDOMINAL PAIN, JAUNDICE, LIVER DAMAGE.
CHRONIC EFFECTS: POSSIBLE CANCER (EVIDENCE OF THIS IS INCONCLUSIVE); REPRODUCTIVE EFFECTS (JAUNDICE, EXCESSIVE SECRETION OF TEARS, DERMAL CHROMOPEXY); AND HEPATITIS.

---------- TOXICITY DATA ----------

ORAL{50}: 1900 MG/KG
CARCINOGENICITY:
THE EPA LISTS PCBS AS CARCINOGENS, AND THE IARC CLASSIFIES THEM AS PROBABLE HUMAN CARCINOGENS (GROUP 2B).

---------- HEALTH HAZARDS ----------

SUMMARY OF RISKS: EFFECTS OF ACCIDENTAL EXPOSURE TO PCBS INCLUDE ACNE FORM ERUPTIONS; EYE DISCHARGE; SWELLING OF THE UPPER EYELIDS AND HYPEREMIA OF THE CONJUNCTIVA; HYPERPIGMENTATION OF SKIN, NAILS, AND MUCOUS MEMBRANE; CHLOROACNE; DISTINCTIVE HAIR FOLLICLES; FEVER; HEARING DIFFICULTIES; LIMB SPASMS; HEADACHE; VOMITING; AND DIARRHEA. PCBS ARE POTENT LIVER TOXINS THAT CAN BE ABSORBED THROUGH UNBROKEN SKIN IN HAZARDOUS AMOUNTS WITHOUT IMMEDIATELY DISCERNIBLE PAIN OR DISCOMFORT. SEVERE HEALTH EFFECTS CAN DEVELOP LATER. IN EXPERIMENTAL ANIMALS, PROLONGED OR REPEATED EXPOSURE TO PCBS BY ANY ROUTE RESULTS IN LIVER DAMAGE AT LEVELS THAT ARE LESS THAN THOSE REPORTED TO HAVE CAUSED CANCER IN RODENTS.

---------- EMERGENCY FIRST AID ----------

EYES. IMMEDIATELY FLUSH EYES, INCLUDING UNDER THE EYELIDS, GENTLY BUT THOROUGHLY WITH FLOODING AMOUNTS OF RUNNING WATER FOR 15 MINUTES.
SKIN. RINSE EXPOSED SKIN WITH FLOODING AMOUNTS OF WATER; WASH WITH SOAP AND WATER.
INHALATION. REMOVE THE EXPOSED PERSON TO FRESH AIR; RESTORE

AND/OR SUPPORT BREATHING AS NEEDED. HAVE QUALIFIED MEDICAL PERSONNEL ADMINISTER OXYGEN AS REQUIRED.
INGESTION. INDUCE VOMITING BY STICKING YOUR FINGER TO THE BACK OF THE EXPOSED PERSON'S THROAT. HAVE HIM OR HER DRINK 1 TO 2 GLASSES OF MILK OR WATER. GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. SEEK PROMPT MEDICAL ASSISTANCE FOR FURTHER TREATMENT, OBSERVATION, AND SUPPORT AFTER FIRST AID.

---------- MEDICAL AGGRAVATIONS ----------

NONE REPORTED.

---------- NOTES TO PHYSICIAN ----------

PCBS ARE POORLY METABOLIZED, SOLUBLE IN LIPIDS, AND THEY ACCUMULATE IN TISSUES OR ORGANS RICH IN LIPIDS. LIVER FUNCTION TESTS CAN HELP TO DETERMINE THE EXTENT OF BODY DAMAGE IN EXPOSED PERSONS. IF ELECTRICAL EQUIPMENT CONTAINING PCBS ARCS OVER, THE PCBS OR OTHER HYDROCARBON DIELECTRIC FLUIDS MAY DECOMPOSE AND GIVE OFF HYDROCHLORIC ACID (HCl), A POTENT RESPIRATORY IRRITANT.

*** SECTION 6 REACTIVITY ***

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
COND. TO AVOID (STAB.):
LIMIT HUMAN EXPOSURE TO PCBS TO THE LOWEST POSSIBLE LEVEL; ESPECIALLY AVOID CONTACT WITH SKIN.

COND. TO AVOID (POLY.):
INCOMPATIBLE MATERIALS:
PCBS CAN REACT DANGEROUSLY WITH SODIUM OR POTASSIUM. THESE REACTIONS ARE PART OF AN INDUSTRIAL PROCESS USED TO DESTROY PCBS; HOWEVER, PEOPLE HAVE BEEN KILLED BY EXPLOSIONS AT PCB TREATMENT, STORAGE, AND DISPOSAL SITES.
HAZARDOUS DECOMPOSITION:
THERMAL-OXIDATIVE DEGRADATION CAN PRODUCE TOXIC GASES SUCH AS CO, CHLORINE, CHLORINATED AROMATIC FRAGMENTS, PHENOLICS, ALDEHYDES, AND HYDROGEN CHLORIDE. INCOMPLETE COMBUSTION YIELDS: TOXINS SUCH AS POLYUCHLORINATED DIBENZOFURAN & POLYCHLORINATED BIBENZO-P-DIOXIN.

*** SECTION 7 SPILL OR LEAK PROCEDURES ***
- STEPS TO BE TAKEN IN CASE OF SPILL, LEAK OR RELEASE -
TREAT ANY ACCIDENTAL RELEASE OF PCBS AS AN EMERGENCY. AN SPCCP (SPILL-PREVENTION CONTROL AND COUNTERMEASURE PLAN) MUST BE FORMULATED BEFORE SPILLS OR LEAKS OCCUR. PCBS ARE RESISTANT TO BIODEGRADATION, SOLUBLE IN LIPIDS, AND CHEMICALLY STABLE; AS SUCH THEY HAVE BECOME SIGNIFICANT CONTAMINANTS OF GLOBAL ECOSYSTEMS. RELEASES OF PCBS REQUIRE IMMEDIATE, COMPETENT, PROFESSIONAL RESPONSE FROM TRAINED PERSONNEL. EACH RELEASE SITUATION IS UNIQUE AND REQUIRES A SPECIFICALLY DESIGNED CLEANUP RESPONSE. GENERAL RECOMMENDATIONS INCLUDE ADHERING TO FEDERAL REGULATIONS (40 CFR PART 761). NOTIFY SAFETY PERSONNEL, EVACUATE NONESSENTIAL PERSONNEL, VENTILATE THE SPILL AREA, AND CONTAIN THE PCBS. ALL WASTES, RESIDUES, AND CONTAMINATED CLEANUP EQUIPMENT FROM THE INCIDENT ARE SUBJECT TO EPA REQUIREMENTS (40 CFR 761). CONSULT YOUR ATTORNEY OR APPROPRIATE REGULATORY OFFICIALS FOR INFORMATION ABOUT

REPORTING REQUIREMENTS AND DISPOSAL PROCEDURES.

---------- WASTE DISPOSAL METHOD ----------

CONTACT YOUR HAZARDOUS WASTE DISPOSAL FIRM OR A LICENSED CONTRACTOR FOR DETAILED RECOMMENDATIONS, ESPECIALLY WHEN PCBS ARE UNEXPECTEDLY DISCOVERED. FOLLOW FEDERAL, STATE, AND LOCAL REGULATIONS. PCBS ARE BIOMAGNIFIED IN THE FOOD CHAIN; I.E., THEIR CONCENTRATION INCREASES AT EACH LINK. THE DISPOSAL OR OF PCBS OR PCB-CONTAMINATED MATERIALS IS STRICTLY REGULATED; VIOLATIONS OF APPLICABLE LAWS CAN RESULT IN FINES, LAWSUITS, AND NEGATIVE PUBLICITY.

*** SECTION 8 SPECIAL PROTECTION INFORMATION ***

---------- VENTILATION ----------

INSTALL AND OPERATE GENERAL AND LOCAL MAXIMUM, EXPLOSION-PROOF VENTILATION SYSTEMS POWERFUL ENOUGH TO MAINTAIN AIRBORNE LEVELS OF THIS MATERIAL BELOW THE OSHA PEL STANDARDS CITED IN SECTION 2. LOCAL EXHAUST VENTILATION IS PREFERRED BECAUSE IT PREVENTS DISPERSION OF THE CONTAMINATION INTO THE GENERAL WORK AREA BY ELIMINATING IT AT ITS SOURCE. CONSULT THE LATEST EDITION OF GENIUM REFERENCE 103 FOR DETAILED RECOMMENDATIONS.

---------- OTHER TEXT ----------

WARNING: AIR PURIFYING RESPIRATORS WILL NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.
OTHER: WEAR IMPERVIOUS GLOVES, BOOTS, APRONS, AND GAUNTLETS, ETC., TO PREVENT ANY CONTACT OF PCBS WITH YOUR SKIN.
SAFETY STATIONS: MAKE EMERGENCY EYEWASH STATIONS, SAFETY/QUICK-DRENCH SHOWERS, AND WASHING FACILITIES AVAILABLE IN WORK AREAS.
CONTAMINATED EQUIPMENT: CONTACT LENSES POSE A SPECIAL HAZARD; SOFT LENSES MAY ABSORB IRRITANTS, AND ALL LENSES CONCENTRATE THEM. DO NOT WEAR CONTACT LENSES IN ANY WORK AREA. REMOVE CONTAMINATED CLOTHING AND LAUNDER IT BEFORE WEARING IT AGAIN; CLEAN THIS MATERIAL FROM YOUR SHOES AND EQUIPMENT. HEAVILY SOILED CLOTHING MUST BE PROPERLY DISCARDED IN A MANNER CONSISTENT WITH APPLICABLE REGULATIONS.
COMMENTS: PRACTICE GOOD PERSONAL HYGIENE; ALWAYS WASH THOROUGHLY AFTER USING THIS MATERIAL AND BEFORE EATING, DRINKING, SMOKING, USING THE TOILET, OR APPLYING COSMETICS. KEEP IT OFF YOUR CLOTHING AND EQUIPMENT. AVOID TRANSFERRING IT FROM YOUR HANDS TO YOUR MOUTH WHILE EATING, DRINKING, OR SMOKING. DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

---------- PERSONAL PROTECTIVE EQUIPMENT - EYE -------

ALWAYS WEAR PROTECTIVE EYEGLASSES OR CHEMICAL SAFETY GOGGLES. WHERE SPLASHING OF PCBS IS POSSIBLE, WEAR A FULL FACE SHIELD. FOLLOW OSHA EYE- AND FACE-PROTECTIONS REGULATIONS (29 CFR 1910.133).

--------- PERSONAL PROTECTIVE EQUIPMENT - GLOVES ------

------- PERSONAL PROTECTIVE EQUIPMENT - RESPIRATOR ----

WEAR A NIOSH-APPROVED RESPIRATOR PER GENIUM REFERENCE 88 FOR THE MAXIMUM-USE CONCENTRATIONS AND/OR EXPOSURE LIMITS CITED IN SECTION 2. FOLLOW OSHA RESPIRATOR REGULATIONS (29 CFR
SECTION 2. FOLLOW OSHA RESPIRATOR REGULATIONS (29 CFR
1910.134). FOR EMERGENCY OR NONROUTINE OPERATIONS (LEAKS OR

CLEANING REACTOR VESSELS AND STORAGE TANKS), WEAR AN SCBA.
-------- PERSONAL PROTECTIVE EQUIPMENT - FACE ---------

--------- PERSONAL PROTECTIVE EQUIPMENT - SKIN --------

--------- PERSONAL PROTECTIVE EQUIPMENT - OTHERS ------

------------------ HYGIENIC PRACTICES -----------------

*** SECTION 9 SPECIAL PRECAUTIONS ***
------------ STORAGE AND HANDLING CONDITIONS ----------
ALL STORAGE FACILITIES MUST HAVE ADEQUATE CONTAINMENT SYSTEMS (DIKES; ELEVATED, NONPOROUS HOLDING PLATFORMS; RETAINING WALLS) TO PREVENT ANY MAJOR RELEASE OF PCBS INTO THE ENVIRONMENT. CAREFULLY DESIGN AND IMPLEMENT THESE EXTRA PRECAUTIONS NOW; DO NOT WAIT UNTIL YOU HAVE TO RESPOND TO AN ACCIDENTAL RELEASE OF THIS MATERIAL.
------------------ OTHER PRECAUTIONS ------------------

---------------------- OTHER TEXT ----------------------
WARNING: ACCIDENTAL SPILLS OF PCBS THAT MAY AFFECT WATER SUPPLIES MUST BE REPORTED TO COAST GUARD PERSONNEL AT THE NATIONAL RESPONSE CENTER, TELEPHONE (202) 426-2675.
OSHA DESIGNATIONS
LISTED AS AN AIR CONTAMINANT (29 CFR 1910.1000 SUBPART Z).
EPA DESIGNATIONS (40 CFR 302.4)
CERCLA HAZARDOUS SUBSTANCE, REPORTABLE QUANTITY: 10 LBS (4.54 KG), PER THE CLEAN WATER ACT (CWA), SEC. 31 (B) (4) AND 307(A).
STORAGE SEGREGATION: STORE PCBS IN CLOSED CONTAINERS IN A COOL, DRY, WELL-VENTILATED AREA. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.

*** SECTION 10 PRECAUTIONARY LABEL ***

MATERIAL SAFETY DATA SHEET

MINERAL OIL REV.DATE 11/01/85

*** SECTION 1 IDENTIFICATION ***

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303
CAS REGISTRY NO:
PROD CODE:
U.N.NUMBER:
CHEM.FAM:
--- SYNONYMS (ALIASES):
(MIDDLY SOLVENT-REFINED OR HYDROTREATED OILS)
WHITE MINERAL OIL
P01437
ALBOLINE
NUJOL
LIGNITE OIL
PARAFFIN OIL

INFORMATION SUPPLIED BY:
GENIUM PUBLISHING CORPORATION
PHONE: 518-377-8855

*** SECTION 2 INGREDIENTS *** A=ACGIH O=OSHA N=NIOSH S=STATE OSHA M=MSHA R=NRC C=CORPORATE 9=OTHER

MATERIAL	---PERCENT RANGE---	EXP. LIMIT	UNITS
PETROLEUM DISTILLATE (C{14} TO	100.00		
PARAFFINIC HYDROCARBONS	65.00		
NAPTHENIC HYDROCARBONS	29.00		
ALKYLATED AROMATIC HYDROCARBON	6.00		

***
* TYPICAL COMPOSITION

*** SECTION 3 PHYSICAL DATA ***

BOILING PT: 500-626 F, 260-330 C
MELTING PT: F, C
PH INFO: PH AT G/L H2O
SPECIFIC GRAVITY (H2O=1): 0.8222
PACKING DENSITY: (KG/M3)
EVAPORATION RATE: (ETHER = 1) NEGLIGIBLE
VAPOR PRESSURE: NEGLIGIBLE
VAPOR DEN.: N/A
SOLUBILITY IN WATER: NEGLIGIBLE
% VOLATILES BY VOL: 90
ODOR THRESHOLD (PPM):
APPEARANCE:
CLEAR, COLORLESS, OILY LIQUID.
ODOR:
PRATICALLY COLORLESS.

*** SECTION 4 FIRE AND EXPLOSION HAZARD DATA ***

FLASH PT: 270 - 444 F, C
AUTOIGNITION TEMP: NO DATA F, C
LOWER EXPLOSIVE LIMIT (LEL): % VOL.
UPPER EXPLOSIVE LIMIT (UEL): % VOL.
SPEC. HAZARD:
---NFPA CLASS---
HEALTH:
FIRE:
REACTIVITY:
OTHER:

---------- FIRE AND EXPLOSION HAZARDS ----------
MINERAL OIL IS A SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT, SPARKS, OR OPEN FLAME.
---------- EXTINGUISHING MEDIA ----------

CARBON DIOXIDE, DRY CHEMICAL OR FOAM. DO NOT USE A SOLID STREAM OF WATER SINCE THE STREAM WILL SCATTER AND SPREAD THE FIRE. USE WATER SPRAY TO COOL FIRE-EXPOSED TANKS/CONTAINERS.
--------- SPECIAL FIRE FIGHTING INSTRUCTIONS ----------
FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING WHEN FIGHTING FIRES INVOLVING MINERAL OIL.**FLASH POINT VARIES WITH GRADE. VALUES RANGING FROM 270DEG.F-444DEG.F HAVE BEEN INDICATED.
---------- OTHER TEXT ----------

*** SECTION 5 HEALTH HAZARD INFORMATION ***

---------- EXPOSURE LIMITS ----------

8 HR 5.0000 MG/M3

---------- COMMENTS ----------
TLV 5.0 MG/M(3)
FUMES OR MISTS OF MINERAL OIL ARE IRRITATING TO THE EYES, MUCOUS MEMBRANES, AND UPPER RESPIRATORY TRACT AND CAN CAUSE HEADACHE, DIZZINESS AND/OR DROWSINESS IF EXPOSURE IS EXCESSIVE. PROLONGED INHALATION OF FUMES CAN RESULT IN LIPOID PNEUMONIA. IF SPLASHED IN THE EYES, MINERAL OIL MAY CAUSE IRRITATION. REPEATED AND/OR PROLONGED CONTACT WITH THE SKIN MAY CAUSE IRRITATION AND/OR DERMATITIS. INGESTION OF MINERAL OIL MAY PRODUCE A CATHARTIC EFFECT (NAUSEA, VOMITING, AND DIARRHEA). ASPIRATION OF MINERAL OIL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONIA. MINERAL OILS ARE SUSPECTED CARCINOGENS OF THE SKIN AND SCROTUM, LARYNX, LUNG AND ALIMENTARY TRACTS. "MINERAL OIL" IS A NAME APPLIED TO MANY MATERIALS. CAS #8002-05-9 COVERS SEVERAL DIFFERENT TYPES WHICH ARE LISTED AS ANIMAL CARCINOGENS BY IARC. CHECK WITH YOUR SUPPLIERS.

---------- ROUTES OF ENTRY ----------

---------- SYMPTOMS OF EXPOSURE ----------

---------- TOXICITY DATA ----------

---------- HEALTH HAZARDS ----------

---------- EMERGENCY FIRST AID ----------
EYE CONTACT: PROMPTLY FLUSH EYES INCLUDING UNDER EYELIDS WITH RUNNING WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.*
SKIN CONTACT: WASH EXPOSED AREA WITH SOAP AND WATER.
INHALATION: REMOVE VICTIM TO FRESH AIR. RESTORE AND/OR SUPPORT BREATHING AS NEEDED. GET MEDICAL HELP.*
INGESTION: CONTACT A PHYSICIAN OR POISON CONTROL CENTER. DO NOT INDUCE VOMITING. IF VOMITING OCCURS, ASPIRATION OF MINERAL OIL MAY RESULT.
---------- MEDICAL AGGRAVATIONS ----------

---------- NOTES TO PHYSICIAN ----------

*** SECTION 6 REACTIVITY ***

STABILITY: STABLE POLYMERIZATION: WILL NOT OCCUR
COND. TO AVOID (STAB.):
AS A COMBUSTIBLE HYDROCARBON, MINERAL OIL MAY REACT VIOLENTLY WITH STRONG OXIDIZING AGENTS.

COND. TO AVOID (POLY.):
INCOMPATIBLE MATERIALS:

HAZARDOUS DECOMPOSITION:
THERMAL DECOMPOSITION OR BURNING MAY PRODUCE CARBON MONOXIDE.

*** SECTION 7 SPILL OR LEAK PROCEDURES ***
- STEPS TO BE TAKEN IN CASE OF SPILL, LEAK OR RELEASE -
NOTIFY SAFETY PERSONNEL OF LARGE SPILLS OR LEAKS. REMOVE ALL SOURCES OF HEAT AND IGNITION. PROVIDE MAXIMUM EXPLOSION-PROOF VENTILATION. EVACUATE ALL NONESSENTIAL PERSONNEL FROM THE AREA. THOSE INVOLVED IN CLEANUP NEED PROTECTION AGAINST INHALATION OF FUMES OR MIST AND CONTACT WITH THE LIQUID. ABSORB SMALL SPILLS ON PAPER TOWEL OR VERMICULITE AND PLACE IN A CLOSED CONTAINER FOR DISPOSAL. DIKE LARGE SPILLS AND COLLECT FOR RECLAMATION OR DISPOSAL. MOP UP RESIDUE WITH SOAP AND WATER. USE CAUTION WHEN PICKING UP SPILLS SINCE FLOOR MAY BE SLIPPERY. DO NOT FLUSH TO SEWER. KEEP OUT OF WATERSHEDS AND WATERWAYS.
---------- WASTE DISPOSAL METHOD ----------
PLACE IN A SUITABLE CONTAINER FOR LICENSED CONTRACTOR, BURN IN AN APPROVED INCINERATOR OR LANDFILL FOLLOW ALL FEDERAL, STATE AND LOCAL REGULATIONS.

*** SECTION 8 SPECIAL PROTECTION INFORMATION ***
---------- VENTILATION ----------
GENERAL VENTILATION IS ADEQUATE FOR THIS HIGH-BOILING MATERIAL, EXCEPT WHEN IT IS HEATED OR MISTED. WHEN FUMES OR MISTS ARE PRESENT, LOCAL EXHAUST VENTILATION IS NEEDED TO MEET THE ACGIH TLV OF 5 MG/M(3). FOR EMERGENCY OR NONROUTINE EXPOSURES WHERE THE TLV MAY BE EXCEEDED, USE AN APPROPRIATE NIOSH-APPROVED RESPIRATOR. ALL ELECTRICAL SERVICE IN USE OR STORAGE AREAS SHOULD HAVE AN EXPLOSION-PROOF DESIGN.
---------- OTHER TEXT ----------
VISCOSITY @ 100DEG.F 39.2 SSU*
VISCOSITY @ 100DEG.F 39.2 SSU*
TO PREVENT SKIN CONTACT, WEAR IMPERVIOUS GLOVES AND, IF NECESSARY, OIL-IMPERVIOUS CLOTHING. WEAR SAFETY GLOVES WITH SIDE SHIELD, SPLASH GOGGLES, OR FACE SHIELD TO PREVENT CONTACT WITH THE EYES. REMOVE CONTAMINATED CLOTHING PROMPTLY AND DO NOT REUSE UNTIL IT HAS BEEN PROPERLY LAUNDERED.
EYEWASH STATIONS AND SAFETY SHOWERS SHOULD BE AVAILABLE IN USE AND HANDLING AREAS.
CONTACT LENSES POSE A SPECIAL HAZARD; SOFT LENSES MAY ABSORB AND ALL LENSES CONCENTRATE IRRITANTS.

---------- PERSONAL PROTECTIVE EQUIPMENT - EYE -------

--------- PERSONAL PROTECTIVE EQUIPMENT - GLOVES ------

------- PERSONAL PROTECTIVE EQUIPMENT - RESPIRATOR ----

-------- PERSONAL PROTECTIVE EQUIPMENT - FACE ---------

--------- PERSONAL PROTECTIVE EQUIPMENT - SKIN --------

--------- PERSONAL PROTECTIVE EQUIPMENT - OTHERS ------

------------------ HYGIENIC PRACTICES ----------------

*** SECTION 9 SPECIAL PRECAUTIONS ***
------------ STORAGE AND HANDLING CONDITIONS ----------
STORE IN CLOSED CONTAINERS IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM STRONG OXIDIZING AGENTS. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.
------------------ OTHER PRECAUTIONS ------------------
USE ONLY WITH ADEQUATE VENTILATION. AVOID INHALATION OF FUMES OR MISTS AND REPEATED OR PROLONGED CONTACT WITH THE SKIN. DO NOT EAT OR SMOKE IN USE OR HANDLING AREAS.
FOLLOW GOOD HOUSEKEEPING AND PERSONAL HYGIENE PRACTICES WHEN HANDLING THIS MATERIAL.
---------- OTHER TEXT ----------

*** SECTION 10 PRECAUTIONARY L

Appendix B

EMERGENCY CONTACTS AND PROCEDURES

EMERGENCY CONTACTS AND PROCEDURES

Contacts: Should any situation or unplanned occurrence require outside or support services, the appropriate agency shall be contacted.

Agency	Person to Contact	Telephone
Police	Dispatcher	911
Fire	Dispatcher	911
Ambulance	Dispatcher	911
Hospital* Summit Hospital	Dispatcher	(510) 655-4000
PG&E Project Coordinator Emeryville Materials Facility	Mel Byrd	(Work) (510) 450-5740 (Page) (510) 678-7955
PG&E Project Manager and On-site Safety Officer	Fred Flint	(Work) 510-866-5808 (Home) 510-680-4394

* Direction to the hospital: See Map, Figure F-1.

Procedures: In the event that an emergency develops on-site, the procedures described below are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on-site; or,
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

1. The on-site Safety Officer will establish emergency evacuation routes and will make all project personnel aware of these routes prior to the first on-site activities. In the event of an emergency, selection of the emergency route will be based on the nature of the emergency and wind direction.
2. In the event that any member of the field crew experiences any adverse effects or symptoms of exposure while on-site, the entire field crew shall immediately halt work and act according to the instructions provided by the on-site Safety Officer.
3. The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in the shut down of activities and evacuation of the field team and re-evaluation of the hazard and the level of protection required.

One of two designated routes to Summit Hospital in Oakland will be used in the case of an emergency or the need for immediate medical treatment. The on-site Safety Officer will determine if an ambulance is required or if the person(s) requiring medical aid can be transported by PG&E personnel. Professional medical transport will be used in cases of unknown or obvious immediate medical attention. Figure B-1 shows the preferred and alternate emergency routes to the hospital.

Figure B-1. Emergency route to Summit Hospital (primary & secondary route).