

PERFORMED FOR
UNIVERSITY OF CALIFORNIA
RICHMOND FIELD STATION
RICHMOND, CALIFORNIA
WALLACE ROBERTS & TODD
121 SECOND STREET, 7TH FLOOR
SAN FRANCISCO, CALIFORNIA 94105
PROJECT NO. 9313ACT
AUGUST 1989

ENVIRONMENTAL ASSESSMENT
OF
UNIVERSITY OF CALIFORNIA
RICHMOND FIELD STATION
RICHMOND, CALIFORNIA



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ENVIRONMENTAL ASSESSMENT

OF

UNIVERSITY OF CALIFORNIA
RICHMOND FIELD STATION
RICHMOND, CALIFORNIA

1.0 INTRODUCTION

Enesco Environmental Services, Inc. (EES), under contract to Wallace Roberts & Todd, conducted a Phase I environmental assessment of the University of California (Berkeley) Richmond Field Station (RFS) located at 1301 South 46th Street in Richmond, Contra Costa County, California. The assessment was performed as part of the University of California's plan to construct a new Research Campus on the undeveloped western portion of the RFS. The new development will include research facilities, a library, and recreational open space.

The assessment evaluated potential environmental liabilities associated with this site and supplemented existing data on the potential existence of hazardous materials and hazardous waste on the site (cited below as Property). The assessment was not required by the California Department of Health Services (DHS), California Regional Water Quality Control Board (RWQCB), or any other local or federal regulatory agency.

The assessment included a Physical Inspection of the Property (Section 3.0) and interviews with personnel familiar with the Property (Section 3.1), a Review of Historical Aerial Photographs (Section 4.0), and an Agency Public Records Review (Section 5.0). Conclusions and Recommendations (Section 6.0) were based on the information gathered from each of these activities. Limitations are provided in Section 7.0.

A Site Location Map (Figure 1) and a General Vicinity Site Map (Figure 2), and soil sample analytical results from former underground storage tank locations on the Property are attached.

2.0 SITE DESCRIPTION

The Property, currently owned and operated by the Regents of the University of California as an engineering field station, is located adjacent to the Richmond Inner Harbor of the San Francisco Bay. It contains 150 acres, approximately 50 acres of which are marshland along its southern border (see Figure 1). Several large chemical and industrial sites border the Property on the north, west, and east. Safeway's distribution center and trucking terminal complex is located north of the RFS. Immediately east of the Safeway terminal is a yard formerly occupied by Pacific Gas & Electric Company and now operated by the California Highway Transportation Department. Bio Rad Laboratories is located west of the RFS. ICI Americas, a large chemical manufacturing facility is adjacent to the Property's eastern border (see Figure 2). Until 1987 ICI Americas was owned by Stauffer Chemical.

Prior to the purchase of the site in 1950 by the University of California, the Property had been subject to many years of industrial activity involving the production of explosives and munitions, and the handling and use of related hazardous materials. These activities can be traced back more than 100 years when several explosives manufacturing companies were located on the eastern portion of the Property. Some time after 1900, California Cap Company (CCC) began purchasing portions of the Property from one of the explosives manufacturers, the Hercules Powder Company. By the 1920's, CCC had acquired additional Property parcels from other small explosives companies, making it the sole manufacturer of explosives on the Property. CCC continued manufacturing explosives until the end of World War II. In 1950 it sold the Property to the University of California. As part of the sale agreement, CCC was required to remove all hazardous materials from the Property. Although CCC reportedly complied with this requirement, the extent of hazardous materials remediation on the Property is not known.

Since its purchase by the University of California, the Property has been used as a research facility for engineering projects, some of which involve the use of hazardous materials. Research work, requiring the storage of equipment, supplies, and laboratory chemicals is conducted in numerous buildings throughout the Property. This assessment will use for identification the building numbers designated by the University of California.

3.0 PHYSICAL INSPECTION OF THE PROPERTY

A physical inspection was conducted on July 10, 1989 to examine the Property for evidence of hazardous waste, improper storage and handling of hazardous materials, and other items of environmental concern. Because of the size of the Property and the large number of buildings located on the RFS, the inspection for storage and handling of hazardous materials was limited to those facilities where hazardous materials are known to be currently utilized and stored. RFS personnel provided EES with a Hazardous Materials Inventory Statement (HMIS) which identified current hazardous materials locations. Locations of potential past hazardous materials are not identified in the current HMIS. The HMIS was prepared in March, 1989 as part of a Hazardous Materials Business Plan for the RFS required by the Hazardous Materials/Occupational Health Division of the Contra Costa County Health Department.

Facilities inspected included Buildings 106, 114, 118, 120, 125, 138, 150, 175, 470, 474, 478 and other buildings and areas where hazardous materials are stored in quantities that currently equal or exceed State and Federal Threshold Planning Quantities. Areas of earlier known hazardous waste activity were also inspected. With the exception of Building 120, no evidence of improper storage or handling of hazardous materials was observed. For the most part, good housekeeping practices regarding the storage of hazardous waste were followed. Laboratory chemicals and cylinders of compressed gases were properly labeled, identified, and secured in storage areas. Hazardous materials storage areas were labeled with appropriate caution signs and "No Smoking" placards.

Building 120 (solvent storage shed) contained approximately twenty 55-gallon drums of thinner, kerosene, and various petroleum hydrocarbon products. Several spills from these drums were observed on the concrete floor of the building and drip pans located underneath the drums were full of product. The spills and drip pans should be cleaned up to prevent any product from impacting soil outside the building.

In addition to the drums inside Building 120, improperly stored or discarded drums were found in three outdoor locations. The first area was located outside the rear wall of Building 120. Approximately twenty unlabeled 55-gallon drums were stacked 3-high against the building wall. Most of the top drums appeared to be empty. However, because of the stacking, it could not be determined if the drums on the bottom were empty or whether the spills from the interior of Building 120 had leaked to the outside. Another six unlabeled 55-gallon drums were found just

outside Building 120 near a small area of stained soil. Several of these were empty, while others contained a mixture of water and unknown product. EBS recommends that all of these drums outside Building 120 be removed for proper disposal or recycling. The second outdoor area of concern was located near Building 197, south of a fuel pump island where approximately forty 55-gallon drums and 5-gallon containers of waste oil are stored. These drums and containers should also be removed for proper disposal or recycling. The third area of improper storage was located outside Buildings 118, 121, and 150. These areas contained approximately twenty additional unlabelled 55-gallon drums filled with product. The contents of these drums should be identified by chemical profiling. Afterward, the drums should be consolidated for removal and proper disposal.

Several areas of the Property that are the former sites of explosives manufacturing or storage, and hazardous materials handling were examined for dead or dying vegetation, bare patches of soil, or other evidence of hazardous materials residues. These areas included the former Mercury Fulminate Production Area located in the southwest corner of the Property, the former Explosives Storage Area located south of Wren Drive, the former Blasting Cap Manufacturing Area located on Owl Way, and the former Shell Manufacturing Area located on Heron Drive (see Figure 2).

Several areas of low lying vegetation in the vicinity of the Mercury Fulminate Site appeared stressed and unhealthy. However, no hazardous waste residues were observed.

The explosives storage area contained several large patches of bare soil, but again, no hazardous waste residues were observed. Reddish soils and minimal vegetation were noted at this location. Larry Bell, RFS Project Coordinator, provided a possible explanation for the presence of these red soils. The red soils are thought to be the remains of slag piles used to retard weeds around Property buildings from Stauffer operations. No evidence of stressed vegetation, bare soil patches, or hazardous waste residues was observed in the former Shell Manufacturing Areas. The ground where the Blasting Cap Manufacturing Area existed has been landscaped with imported topsoil, lawn grass, and chemical fertilizer. However, there are noticeable areas where the grasses are not growing. EBS' recommendations for soil and groundwater sampling in the Mercury Fulminate Area and Explosives Storage Area are presented in Section 6.0, Conclusions and Recommendations.

3.1 Interviews

Personal interviews with key RFS personnel were conducted by Janet Mack, University of California (Berkeley) Campus Planning Office, to gather additional information regarding use and storage of hazardous materials at RFS facilities. Results of her interviews are summarized below:

• Larry Bell, RFS Project Coordinator

Mr. Bell stated that several underground fuel and solvent storage tanks were previously located near Buildings 119, 154, and 156. These tanks have been excavated and removed from the Property. Soil samples taken from below each tank were analyzed for constituents consistent with the tank contents. Results of the analyses from each tank indicated that contamination of the soil underneath each tank had not occurred. A copy of all analytical results are attached to this report.

A 1300 gallon underground fuel tank is located west of Building 197. This tank is precision tested annually. No evidence of leakage from this tank has been detected since its construction in 1980.

• Antony Oppenheim, Professor Emeritus, Mechanical Engineering

Dr. Oppenheim was interviewed regarding his research work on an explosion chamber. He stated that no chemicals are used as part of his research.

• Mechanical Engineering, Former Rarefied Gas Wind Tunnel

Machinery used in the development of this project ran on steam. Polychlorinated biphenyls (PCB) containing oil was not used as a fuel source or lubricant in this machinery as earlier suspected. No chemicals were stored for this project.

• Institute of Transportation Studies, Bituminous Soils Laboratory

Only very small amounts (approximately 5 gallons) of asphalt are currently stored in facilities involved with this project.

- Everett Howe, Professor Emeritus, Mechanical Engineering, Former Sea Water Conversion Project

Janet Mack, Campus Planning Office, is waiting for information from Dr. Howe.

- Mike Merriman, Specialist, Forest Products Laboratory

The Forest Products Laboratory research facilities are located in Buildings 470-476 on the eastern corner of the Property near South 46th Street. Research on development of wood preservatives and treatment chemicals involved the use of various solvents and other compounds which may contain copper, chromium, and arsenic (CCA) solution, a typical product used in wood preserving. It is suspected that some of these materials have been dumped in the eucalyptus grove immediately behind the laboratory. Soil sampling of this area by the DHS has been scheduled. EES was unable to confirm the completion of this task.

An asphalt pad located between Buildings 472 and 476 was used for storage of solvent containers. Mr. Merriman expressed concern that chemicals may have leaked, penetrated the asphalt pad, and contacted the soil underneath.

Behind Building 470, an experimental furnace, constructed with chrome ore bricks, was used to burn spent pulping liquor. The furnace has been dismantled and the chrome bricks were removed by a licensed contractor. Because of chromium's potential for being a carcinogen, Mr. Merriman also expressed concern regarding the adequacy of the brick rubble cleanup and removal.

After reviewing the results of Ms. Mack's interview with Mr. Merriman, EES staff inspected the area around the Forest Products Laboratory for evidence of hazardous wastes and chemical spills. Chemical leakage on the asphalt pad between Buildings 472 and 476 was not observed. A secured drum storage area located on the asphalt pad was inspected for evidence of leaks or spills. No evidence was observed. Approximately 12 empty 55-gallon drums were found neatly stored in the eucalyptus grove. These containers appeared to be clean and well maintained. No evidence of leakage from these drums was observed.

EES' recommendations for soil sampling in the area surrounding the Forest Products Laboratory are presented in Section 6.0, Conclusions and Recommendations. EES'

understanding is that any soil sampling or remediation of contaminated soil in the Forest Products Laboratory area will be conducted by the University of California (Berkeley) Office of Environmental Health and Safety.

- Dana Crowder, Purchasing and Receiving, RFS

On July 20, 1989 EES interviewed Dana Crowder, an employee of RFS since the early 1950's, regarding the location of former hazardous materials storage and handling areas. Mr. Crowder reviewed historical aerial photographs of the Property supplied by EES and provided historical information regarding activities on the Property just after it was purchased by the University of California. His comments are included in Section 4.0 below.

4.0 REVIEW OF HISTORICAL AERIAL PHOTOGRAPHS

Historical aerial photographs (1985, 1969, 1959, 1947) of the Property and surrounding area were reviewed at Pacific Aerial Surveys in Oakland, California to identify former locations of hazardous materials storage and handling on the Property and adjacent sites. A 1930 map identifying the Property as California Cap Company was also reviewed. This earlier map provided no additional information on the site's history.

1985 Photograph

In a 1985 photograph, obtained from Larry Bell (RFS), the large patches of bare soil were observed in the vicinity of the former Explosives Storage Area, south of Wren Drive. Other areas of bare soil were noted immediately west of Building 167 near an existing water well. Vegetation in the vicinity of the former Blasting Cap Manufacturing Area and Shell Manufacturing Area appeared normal. Near the former Mercury Fulminate Area, bare soil areas were also observed. Sparse vegetation was noticed directly east of the former chrome brick oven near Building 470 of the Forest Products Laboratory. No evidence of hazardous materials dumping was observed in the area around Buildings 470-476.

Since the 1985 photograph was taken, no new development has occurred in the western portion of the Property.

The photograph showed heavy industrial activity on the ICI Americas (formerly Stauffer Chemical) site and the Bio Rad site bordering the Property. A large above ground tank farm on the ICI site was observed along South 46th Street directly east of Building 120 on the Property. According to Dana Crowder, this tank farm was used in the production of sulfuric acid. Large areas of dark and light stains were also observed on the western portion of the ICI site. Four large treatment ponds were located on the southern portion of the ICI site adjacent to marshlands bordering the Richmond Inner Harbor. Railroad tank cars were visible in the center of the ICI site near a large manufacturing complex.

1969 Photograph

In an enlarged 1969 photograph obtained from Pacific Aerial Surveys (No. AV-902-07-08), a large area of barren soil was observed in the vicinity of the former Explosives Storage Area near Wren Drive. Other areas of bare soil were also noted near this location. However, according to Dana Crowder, these areas were the former location of sheds and other small buildings which presumably did not contain explosives or other hazardous materials. Areas of bare soil were not observed in the former Mercury Fulminate Area. Sparse vegetation was observed in the former Blasting Cap Manufacturing Area.

Heavy industrial activity was observed on the ICI Americas site and the Bio Rad site. A large light stain was observed on the ICI Americas site directly south of Building 194 on the Property. The large above ground tank farm was visible east of Building 120. Another above ground tank farm, railroad tank cars, and storage areas of industrial materials were observed on the ICI site. The western portion of the Property was observed at its current level of development. No evidence of negatively impacted vegetation in this area was observed.

1959 Photograph

In an enlarged 1959 photograph obtained from Pacific Aerial Surveys (No. AV-337-08-12), the Explosives Storage Area near Wren Drive was clearly visible. A large quantity of materials was observed inside the walled storage area. Grounds in the vicinity of the former Blasting Cap Area, Shell Manufacturing Area, and Mercury Fulminate Production Area were undeveloped. It was not possible to determine if these soils were negatively impacted from residual hazardous materials.

The Forest Products Laboratory and the western portion of the Property were undeveloped. The only evidence of previous development on the western portion of the Property was the construction of an unimproved roadway grid.

Industrial activity on the ICI Americas site appeared to be essentially the same as in later photographs. Large spills of a light compound, identified by Dana Crowder as sulfur, were observed in the vicinity of the sulfuric acid tank farm. A large materials storage yard and several large ponds were located near the Richmond Inner Harbor. According to Dana Crowder, waste materials including mercaptans had been dumped into these ponds by Stauffer Chemical.

A large materials storage yard, heavy equipment and large trucks were observed on the Bio Rad site.

1947 Photograph

In an enlarged 1947 photograph obtained from Pacific Aerial Survey (No AV-11-04-05), the former Mercury Fulminate Production Area was observed on the southwest corner of the Property. The walled Explosives Storage Area near Wren Drive was also visible. As in the 1959 photograph, the Forest Products Laboratory was not developed. Details of vegetation patterns and soil quality in other hazardous materials production areas were difficult to see because of the age of the photograph and poor quality due to enlargement.

As in the 1959 photograph, the western portion of the Property was undeveloped. Only unimproved roads appeared on this portion of the Property. Scattered residential housing was observed on the sites currently occupied by Bio Rad Laboratories, Safeway complex, and the Cal Trans Corporation Yard.

The Stauffer Chemical site was less developed. However, the photo did show evidence of heavy industrial activity at the site. The sulfuric acid plant near the Property was less developed. Spills and stains in this area were difficult to observe due to the poor quality from enlargement of the original photo.

5.0 PUBLIC RECORDS REVIEW

To identify potential exposure of the Property to hazardous materials incidents, EES reviewed public records available from local regulatory agencies and geotechnical consultants. Further, because subsurface contamination is capable of migrating in groundwater from nearby sites, public records were also reviewed to determine if toxic spills or fuel leaks have been reported near the Property. Results of the public records review are presented below:

5.1 Contra Costa County Health Services, Hazardous Materials Division (CCCHS)

The most recent listings of unauthorized fuel leaks and reported toxic spills were reviewed at the CCCHS offices in Martinez, California. Reports for all documented incidents involving hazardous materials adjacent to the Property were reviewed. Confirmed toxic spills have been reported for Bio Rad Laboratories, ICI Americas, and Liquid Gold Oil Corporation, a former oil recycler located near ICI Americas. A summary of each case is presented below.

- Bio Rad Laboratories, 32d Street and Regatta Boulevard, Richmond

Bio Rad Laboratories uses radioactive materials in the production of separation technology products. An unknown amount of cobalt 57 was released on the site on August 12, 1987. A formal complaint against Bio Rad was filed with the California Department of Health Services (DHS) on behalf of workers at the site who were exposed to the release and cleanup operations.

Information in the file indicated that contamination by chloroform and acrylamide of a creek located on Bio Rad land had occurred. Although the extent of the spill was not defined, the contamination was consistent with wastes generated by manufacturing processes at Bio Rad.

- ICI Americas, 1415 South 47th Street, Richmond

The ICI Americas currently manufactures sulfuric acid and organic herbicides. EES reviewed a CH₂M Hill report (June 16, 1988) summarizing previous groundwater quality investigation conducted on this site in 1988 by Larry E. Hall, Hydrogeological Associate. According to this report, ICI Americas also manufactures or generates pyrite cinders, fuels, ferric sulfate, pesticides, solvents, and alum. Groundwater monitoring wells were completed on the site and

samples were collected for analyses of priority metals and organic compounds. According to the CH₂M Hill report, the analytical results were difficult to interpret. Units of measurement (parts-per-million vs. parts-per-billion) were unclear.

The CH₂M Hill report also stated that the Regional Water Quality Control Board (RWQCB) requested ICI to perform a hydrogeologic investigation near a closed cinder landfill on the site. A preliminary investigation was completed in 1987. Under a remedial action program designed and implemented by Stauffer Chemical, shallow groundwater contaminated with pesticides was being extracted and treated. The RWQCB also informed Stauffer of the requirements of the Toxic Pits Control Act (TPCA) regarding sampling and cleanup of surface impoundments on this site.

This site has also been cited by Contra Costa County for noncompliance regarding treatment, storage, and disposal of hazardous wastes without appropriate regulatory agency permits.

- Liquid Gold Oil Corporation, Richmond

This site is located approximately 1/2 mile south of the Property, adjacent to ICI Americas. From 1974 until 1982, this site was leased by the Liquid Gold Oil Corporation to store and recycle used oil and other substances. Prior to 1974, the site operated an asphalt manufacturing plant. As a result of these operations, hazardous materials were spilled or leaked onto the ground around storage tanks; were discharged into ponds, sumps, and ditches on the site; and drained into nearby wetlands areas. Soil and groundwater have been contaminated with oil and grease, phenols, lead, nickel, copper, chromium, zinc, PCBs and other compounds. This site is currently listed on State and Federal National Priority Site Lists (Superfund) as an abandoned hazardous waste disposal site.

Southern Pacific Transportation Company owns the land on which this site was located and has assumed all responsibility for cleanup and delisting of this site.

5.2 Regional Water Quality Control Board (RWQCB)

No additional sites within the vicinity of the Property have been reported to this agency.

5.3 California Department of Health Services (DHS)

Extensive soil sampling and analyses of the Property was previously completed by this agency in 1982. The results of these studies indicated low levels of priority metals contamination in soils near the former Explosives Storage Area, Blasting Cap Manufacturing Area, and the undeveloped western portion of the Property. Although these data indicated the presence of metals contamination in varying concentrations on the Property, none of these concentrations exceeded the Total Threshold Limit Concentration (TTL) established by the DHS for priority metals. Mercury was not detected in any soil samples collected.

5.4 CH₂M Hill Consultants

Additional soil sampling on the Property was conducted by this consulting firm in 1988. Based upon a review of background information concerning the Property and the results of previous soil sampling activities, CH₂M Hill recommended additional soil sampling and installation of groundwater monitoring wells on the Property. Soil sampling was completed in Fall, 1988. The results of this investigation indicated mercury contamination in soils near the former Mercury Fulminate Production Area above the TTL level for this metal. Analyses of other soil samples from the Property detected low levels of priority metals. Soil samples collected from the undeveloped western portion of the Property were also analyzed for pesticide residues. No pesticides were detected in these samples. Because of the low levels of metals and pesticides found in nearly all soil samples, groundwater monitoring wells were not installed on the Property.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon a physical inspection of the Property and a review of current hazardous materials handling and storage practices, EHS has concluded that soils in the vicinity of the Forest Products Laboratory may have been subject to environmental impairment from research activities connected with the Laboratory.

Based upon a review of historical aerial photographs, interviews with key RFS personnel, and a review of available public records, EHS has concluded that soils and groundwater under the Property may have been subject to environmental impairment from manufacturing and handling of hazardous materials associated with the long history of industrial activities on the Property and adjacent sites. Previous studies of the Property conducted by the California Department of Health

Services (DHS) and private geotechnical consulting firms have detected varying levels of priority metals in RFS soils. Several soil samples collected from the former Mercury Fulminate Production Area contained mercury above the TLLC level established for this metal by the DHS. Additionally, soil samples collected from the former Explosives Storage Area, Blasting Cap Manufacturing Area, and Shell Manufacturing Area were not analyzed for nitrogen-containing residues. The manufacturing of explosives and munitions typically involves nitrogen-containing compounds. Finally, groundwater under these areas has not been analyzed for nitrogen-containing compounds or volatile organic compounds (VOCs)

Based upon these conclusions, EHS recommends the following actions be taken to fully define the extent of contamination of soil and groundwater, if any, under the Property.

Forest Products Laboratory

- Drill one exploratory boring through the asphalt pad between Building 472 and 476 to a depth of 3 feet and collect one soil sample for analyses of pentachlorophenol, arsenic, copper, chromium and VOCs.

- Drill three exploratory borings to a depth of 3 feet immediately behind Building 470 and collect one soil sample from each boring for analysis of chromium.

- Collect two surface soil samples from the shallow ditch, carrying runoff from the asphalt pad, near the former chrome brick oven for analysis of VOCs and solvents.

- Drill one exploratory boring to a depth of 3 feet directly behind the wood preservative test chamber located on the asphalt pad and collect one soil sample for analysis of pentachlorophenol, arsenic, copper, chromium and VOCs.

Former Mercury Fulminate Production Area

- Drill a maximum of twenty 5-foot soil borings in an approved grid pattern covering the former Mercury Fulminate Production Area. Collect one soil sample from each boring, analyze each soil sample for mercury residues, continue five of the borings to contact the uppermost water bearing stratum, collect one water sample from each borehole, and analyze each water sample for mercury.

Former Explosives Storage Area, former Shell Manufacturing Area, and former Blasting Cap Area

- Drill a maximum of twenty 5-foot soil borings in an approved grid pattern covering the former explosives storage area, collect one soil sample from each boring, and analyze each soil sample for nitrate residues. Continue five of the borings to contact the uppermost water bearing stratum, collect one water sample from each borehole, and analyze each water sample for nitrates and VOCs.

- Drill a maximum of five 5-foot soil borings in the former Shell Manufacturing area, collect one soil sample from each boring, and analyze each soil sample for nitrates.
- Drill a maximum of five 5-foot soil borings in the former Blasting Cap Area, collect one soil sample from each boring, and analyze each soil sample for nitrates.

Miscellaneous

- As previously recommended in Section 3.0, Physical Inspection of the Property, chemically profile unknown products in 55-gallon drums and 5-gallon containers located near Buildings 118, 120, 121, 150, and 197. After positive identification of the contents, all drums and containers should be transported off the Property by a certified hazardous waste hauler for disposal or recycling.

7.0 LIMITATIONS

Environmental regulations, on a local, state, and federal level, can vary significantly over time. Similarly, Property conditions will inevitably change over time. Consequently, the conclusions and recommendations derived at in the course of preparing the environmental assessment are strictly applicable to the status of environmental regulations and the Property conditions existing at the time EBS performed the study. EBS assumes that the data obtained and the inferences made in the course of the investigation are reasonably representative of the Property. EBS makes no warranty, expressed or implied, except that our services have been performed in accordance with generally accepted existing environmental engineering, health and safety principles, and applicable regulations at the time and location of the proposed study. EBS has analyzed the available information using what we believe to be currently applicable engineering techniques.

ATTACHMENT A

FIGURE 1 SITE LOCATION MAP

FIGURE 2 GENERAL VICINITY SITE MAP



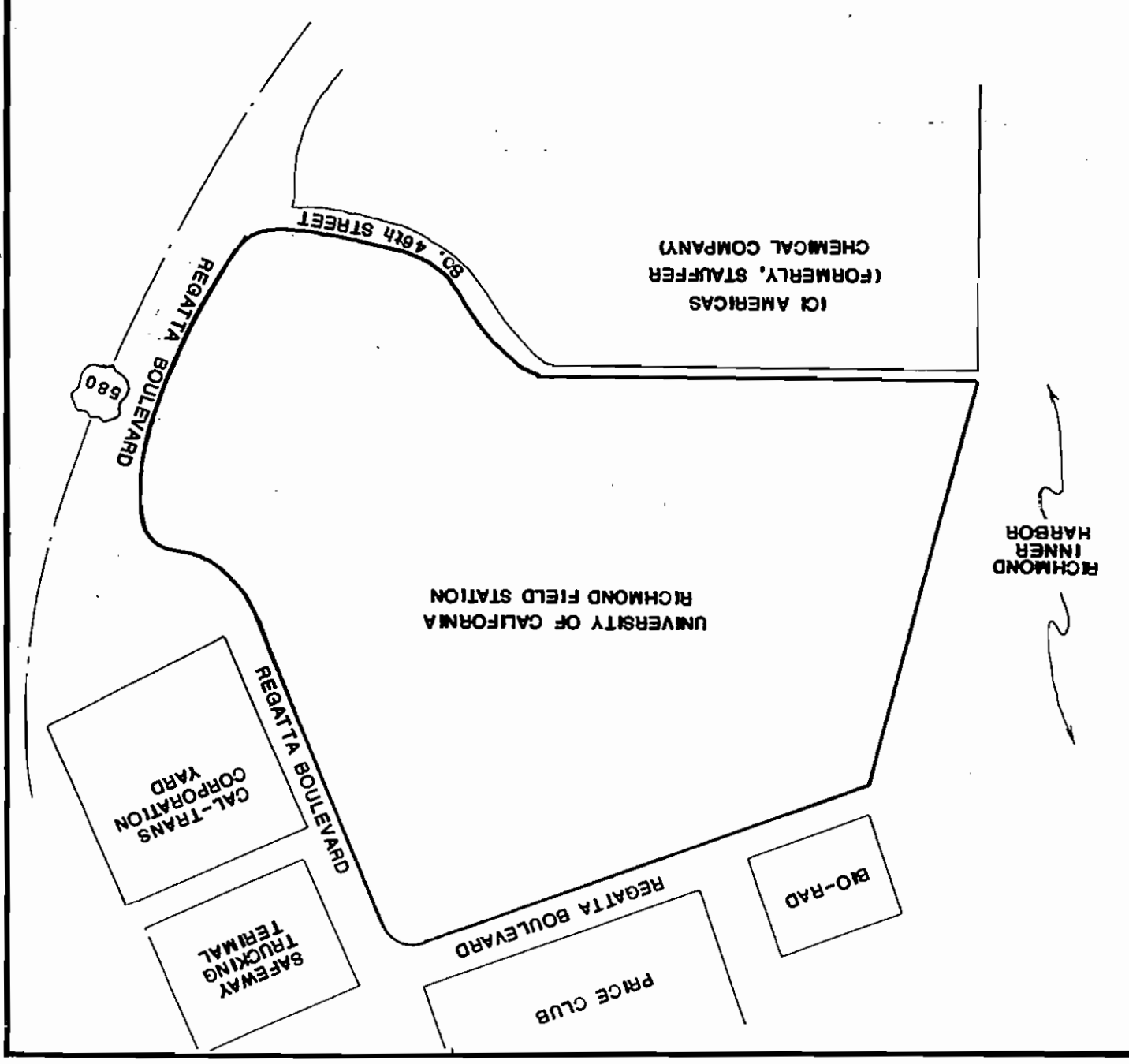
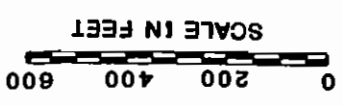
GENERAL VICINITY SITE MAP

UNIVERSITY OF CALIFORNIA - RICHMOND FIELD STATION

1301 SOUTH 46TH ST. AND REGATTA BLVD.

RICHMOND, CALIFORNIA

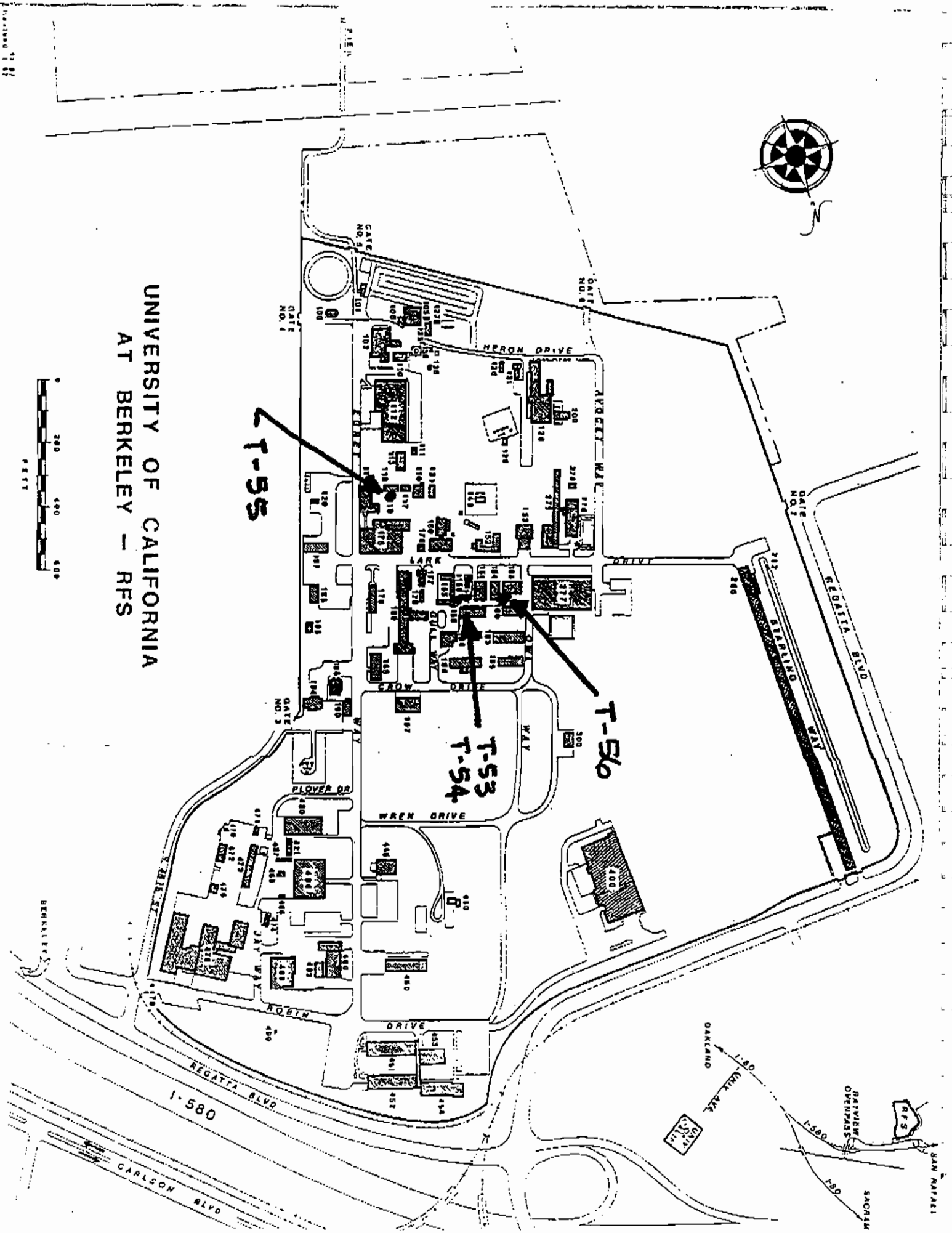
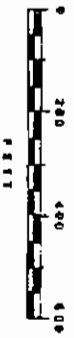
JOB # 9313A
DRAWN BY: SLS
DATE: 8-14-89
DRAWING # FIG. 2



**FORMER UNDERGROUND STORAGE TANKS
FROM
SOIL SAMPLE RESULTS**

ATTACHMENT B

UNIVERSITY OF CALIFORNIA
AT BERKELEY - RFS



T-55

T-54

T-56

1-580

OAKLAND
1-580
DIXIE AVE

1-580
RAVINE
OVERPASS

SACRAM

SAN RAFAEL



Thermo Analytical Inc.

TMA/ERG

100 West 51st Street

Suite 450

Emeryville, CA 94608 2946

(415) 652-2370

November 5, 1986

University of California
1301 South 46th St.
Richmond, CA 94804

Attention: Larry Bell

Report #9601

P.O. #7-273848-TR

E: Three (3) soil samples submitted on November 3, 1986 for
ash diesel fuel analysis.

Procedure: The samples are analyzed for diesel fuel by following
the method described in Attachment 2, Analytical Procedures for
Fuel Leak Investigations. The samples are concentrated on a
Tekmar LSC-2 automatic sample concentrator prior to injection
into a gas chromatograph fitted with a flame ionization detector.
Quantitation is performed, as total hydrocarbon response, against
known concentrations of heptane-isooctane (45/55). The limit of
detection for this method of analysis is two parts per million
(mg/kg).

The results are displayed in the table below:

TMA/ERG #	CLIENT ID	CONCENTRATION (mg/kg)
9601-1	T-53	ND(2)
9601-2	T-54	4.3
9601-3	T-56	4.7

Submitted by:

Robert B. Flay

Manager, Organics Department

RBFL:sm]

DATE RECEIVED: July 5, 1988
 DATE STARTED: July 11, 1988
 DATE COMPLETED: July 12, 1988

BY: *Paul R. [Signature]*

Compound	Test Methods	Result (ug/kg)	Report (ug/kg)
BENZENE	3818	ND	12
TOLUENE	3818	ND	12
XYLENES (Total)	3818	ND	12
<hr/>			
GASOLINE	3818	ND	0.5
STANDARD	3818	NC	0.5
PAINT THINNER	3818	ND	0.5
DIESEL	Extract 3510 - FID, direct inject	ND	1
KEROSENE	Extract 3519 - FID, direct inject	ND	1
MOTOR OIL	Extract 3510 - FID, direct inject	ND	12

TOTAL PETROLEUM HYDROCARBONS

CLIENT: UC Berkeley - Office of State Architect
 STREET: 2000 Carleton
 CITY: Berkeley
 STATE: CA
 ZIP: 94720
 SAMPLE LOCATION: Richmond Field Station - #1
 COLLECTED BY: Terry Hamilton
 DATE COLLECTED: June 30, 1988
 COPY TO: O.S.A. - P.O. Box 1825
 Sacto, CA 95812 Attn: J. Conde
 PURCHASE ORDER: N/A
 LAB I.D.: P-66318

UNIV. OF CALIF. BERKELEY

88 JUL 25 P 4:28

FACILITIES MANAGEMENT

SOIL TEST
 550 GAL. TRUCK (T-5)